OECD Food and Agricultural Reviews

# Agricultural Policies in the Philippines

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BETTER POLICIES FOR BETTER LIVES

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# *Foreword*

*This* Review of Agricultural Policies: The Philippines *is one of a series of reviews of national agricultural policies undertaken by the OECD's Committee for Agriculture (CoAg). It was initiated in response to a request from Mr. Segfredo Serrano, Undersecretary for Policy Planning, Project Development, Research and Regulations, in the Philippine Department of Agriculture (DA).*

*The* Review *examines the agricultural policy context and the main trends in Philippine agriculture. It classifies and measures the support provided to agriculture using the same method the OECD employs to monitor agricultural policies in OECD countries and a growing number of non-member economies, such as Brazil, China, Colombia, Indonesia, Kazakhstan, Russia, South Africa, Ukraine and Viet Nam. At the request of the Philippine authorities, the* Review *includes a special chapter on the adaptation of Philippine agriculture to climate change. The* Review *is the first stage in regular OECD engagement with the Philippines on agricultural policy issues through the annual OECD publication* Agricultural Policy Monitoring and Evaluation.

*The study was carried out by the Development Division of the OECD Trade and Agriculture Directorate (TAD) in co-operation with the Natural Resources Policy Division (TAD). Andrzej Kwieciński co-ordinated the report and was one of the authors together with Piret Hein (Estonian Institute of Economic Research) and Ada Ignaciuk (TAD). Addie Erwin (TAD) prepared a background draft for Chapter 1. Contributions for this chapter were also provided by Claude Nenert, Lae Hyun Hong and Antonia Leroy (all from TAD). Chapter 3 benefited from a background draft delivered by Maria Jaramillo (UNEP) as well as from contributions by Shingo Kimura and Laura Munro (both from TAD). The database for Producer Support Estimates and the associated analytical work was undertaken by Florence Bossard and Andrzej Kwieciński, in close co-operation with Piret Hein, Eduardo Sanguyo (Philippine Statistical Authority) and Elsie Balagtas (DA). Statistical support was provided by Florence Bossard, with contributions from Karine Souvanheuane and Joanna Ilicic-Komorowska. Maurice O'Brien provided editorial support. Anita Lari provided administrative and secretarial assistance. Anita Lari and Michèle Patterson provided publication support.*

*The* Review *greatly benefited from support provided by the DA. The team led by Undersecretary Serrano, in particular Amparo C. Ampil, Tisha Pia Dela Rosa, Frances Kaye Anne Adao and Katrin Mares, were the main contacts and liaison persons on all aspects of the study. The study benefited from inputs by staff from the DA and its related entities, from other Departments and from participants at preparatory meetings and consultations in Manila and Quezon City, including researchers from academia.*

*Earlier drafts of this report benefited from comments provided by Julia Nielson, Jared Greenville, Carmel Cahill, Ken Ash, Frank Jesus, Jo Cadilhon, Dalila Cervantes-Godoy, Addie Erwin, Emily Gray, Guillaume Gruère, Shingo Kimura, Mark Mateo, Laura Munro, Silvia Sorescu, Frank van Tongeren (all from TAD/OECD), Piret Hein (Estonian Institute of Economic Research), Frauke Jungbluth and Sergiy Zorya (World Bank office in Manila), representatives of the Economic Research Service of the United States Department of Agriculture and representatives of the French General Secretariat for European*

*Affairs. The first complete draft of this document was reviewed by participants of roundtable meetings at the DA in Quezon City. Written comments were provided by various Philippine Departments and institutions and were considered for the final version of the* Review.

*The study was made possible through a voluntary contribution from the United States. It was reviewed at in-country roundtable meetings with Philippine officials and experts in Quezon City on 30 May-1 June 2016. Subsequently, the Philippine delegation led by Undersecretary Segfredo Serrano participated in the peer review of Philippine agricultural policies by the OECD's Committee for Agriculture at its 167th session in November 2016. Steve Neff (ERS-USDA, USA), Catherine Stephenson (Permanent Delegation of Australia to the OECD) and Masakazu Ikefuchi (Japanese Ministry of Agriculture, Forestry and Fisheries) led the discussions during this peer review. Philippine officials and experts have been involved from initial discussions of the study outline through to the peer review and final revisions, but the final report remains the sole responsibility of the OECD.*

# *Table of contents*

## Tables

## Figures

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# Abbreviations

| | |
|---|---|
| **A&D** | Alienable and Disposable |
| **ACEF** | Agricultural Competitiveness Enhancement Fund |
| **ACPC** | Agricultural Credit Policy Council |
| **ADB** | Asian Development Bank |
| **AF** | Adaptation Fund |
| **AFMA** | Agriculture and Fisheries Modernization Act |
| **AFMech** | Agricultural and Fisheries Mechanization Law |
| **AFTA** | ASEAN Free Trade Area |
| **AGEI** | Agricultural Growth Enabling Index |
| **AGFP** | Agricultural Guarantee Fund Pool |
| **AMCFP** | Agro-Industry Modernization Credit and Financing Program |
| **AMIA** | Adaptation and Mitigation Initiative in Agriculture |
| **APPC** | Asia-Pacific Policy Center |
| **ARB** | Agrarian Reform Beneficiaries |
| **ARMM** | Autonomous Region of Muslim Mindanao |
| **ASAPP** | Accelerated and Sustainable Anti-Poverty Program |
| **ASEAN** | Association of Southeast Asian Nations |
| **ATI** | Agricultural Training Institute |
| **ATIGA** | ASEAN Trade in Goods Agreement |
| **AVA** | Agribusiness Venture Arrangement |
| **AWD** | Alternate Wetting and Drying |
| **BAFS** | Bureau of Agricultural and Fishery Standards |
| **BAI** | Bureau of Animal Industry |
| **BAR** | Bureau of Agricultural Research |
| **BFAR** | Bureau of Fisheries and Aquatic Resources |
| **BPI** | Bureau of Plant Industry |
| **BPO** | Business Processing Outsourcing |
| **BSWM** | Bureau of Soil and Water Management |
| **CAF** | Census on Agriculture and Fisheries |
| **CAR** | Cordillera Administrative Region |
| **CARP** | Comprehensive Agrarian Reform Program |
| **CARPER** | Comprehensive Agrarian Reform Program Extension with Reform |

| | |
|---|---|
| **CBD** | Convention on Biological Diversity |
| **CC RDEAP** | Climate Change R&D and Extension Agenda and Program |
| **CGAFS** | CGIAR Research Program on Climate Change, Agriculture and Food Security |
| **CCC** | Climate Change Commission |
| **CGSWP** | Climate Change Systems-Wide Program |
| **CEPT** | Common Effective Preferential Tariff |
| **CIS** | Communal Irrigation System |
| **CLOA** | Certificate of Land Ownership Award |
| **CPBRD** | Congressional Policy and Budget Research Department |
| **CSE** | Consumer Support Estimate |
| **DA** | Department of Agriculture |
| **DAR** | Department of Agrarian Reform |
| **DBM** | Department of Budget Management |
| **DCP** | Directed Credit Programme |
| **DENR** | Department of Environment and Natural Resources |
| **DILG** | Department of Interior and Local Government |
| **DOST** | Philippine Department of Science and Technology |
| **EFTA** | European Free Trade Area |
| **EO** | Executive Order |
| **EU** | European Union |
| **FAO** | Food and Agriculture Organization of the United Nations |
| **FDI** | Foreign Direct Investment |
| **FIELDS** | Fertilizer, Infrastructure and Irrigation, Extension and Education, Loans, Drying and other post-harvest facilities, Seeds |
| **FIES** | Family Expenditure and Income Survey |
| **FMR** | Farm to Market Roads |
| **FO** | Farmers' Organisations |
| **FPA** | Fertiliser and Pesticide Authority |
| **FSSP** | Food Staples Sufficiency Programme |
| **GAA** | General Appropriations Act |
| **GAO** | Gross Agricultural Output |
| **GDP** | Gross Domestic Product |
| **GFDL** | General Fluid Dynamics Laboratory Model |
| **GFDRR** | Global Facility for Disaster Reduction and Recovery |
| **GM** | Genetically Modified |
| **GNI** | Gross National Income |
| **GOCC** | Government-Owned and Controlled Corporation |
| **GSSE** | General Services Support Estimate |

| | |
|---|---|
| **HGEM** | Hadley Centre Global Environmental Model |
| **HRCP** | Hybrid Rice Commercialisation Programme |
| **HS** | Harmonised System |
| **IA** | Irrigators Association |
| **IFPRI** | International Food Policy Research Institute |
| **ILO** | International Labour Organization |
| **IMF** | International Monetary Fund |
| **IMPACT** | International Model for Policy Analysis of Agricultural Commodities and Trade |
| **IPCC** | Intergovernmental Panel on Climate Change |
| **IPPC** | International Plant Protection Convention |
| **IPRA** | Indigenous Peoples' Rights Act |
| **IPSL** | Institute Pierre-Simon Laplace Model |
| **IRR** | Implementing Rules and Regulations |
| **IRRI** | International Rice Research Institute |
| **ISF** | Irrigation Service Fee |
| **LARA** | Land Administration Reform Act |
| **LBP** | Land Bank of the Philippines |
| **LGU** | Local Government Unit |
| **LMB** | Land Management Bureau |
| **MAV** | Minimum Access Volume |
| **MFN** | Most Favoured Nation |
| **MIROC** | Model for Interdisciplinary Research on Climate |
| **MPS** | Market Price Support |
| **MTPDP** | Medium-Term Philippine Development Plan |
| **NCCAP** | National Climate Change Action Plan |
| **NCR** | National Capital Region |
| **NDA** | National Dairy Authority |
| **NDMC** | National Drought Mitigation Center |
| **NEDA** | National Economic and Development Authority |
| **NEP** | National Expenditure Programme |
| **NFA** | National Food Authority |
| **NFSCC** | National Framework Strategy on Climate Change |
| **NGO** | Non-Governmental Organisation |
| **NIA** | National Irrigation Administration |
| **NIS** | National Irrigation System |
| **NLUA** | National Land Use Act |
| **NMIS** | National Meat Inspection Service |
| **NTA** | National Tobacco Administration |

| | |
|---|---|
| **O&M** | Operation and Maintenance |
| **ODA** | Official Development Assistance |
| **OECD** | Organisation for Economic Co-operation and Development |
| **OG** | Official Gazette |
| **OIE** | World Organisation for Animal Health |
| **OPA** | Office of Provincial Agriculturist |
| **OPAFSAM** | Office of the Presidential Assistance for Food Security and Agricultural Modernization |
| **PAGASA** | Philippine Atmospheric, Geophysical and Astronomical Service Administration |
| **PAPs** | Programmes, Activities and Projects |
| **PCA** | Philippine Coconut Authority |
| **PCAF** | Philippine Council for Agriculture and Fisheries |
| **PCARRD** | Philippine Council for Agriculture and Resources Research and Development |
| **PCF** | Performance Challenge Fund |
| **PCFC** | People's Credit and Finance Corporation |
| **PCIC** | Philippine Crop Insurance Corporation |
| **PDP** | Philippine Development Plan |
| **PhilCCAP** | Philippine Climate Change Adaptation Project |
| **PhilMech** | Philippine Center for Postharvest Development and Mechanisation |
| **PhilRice** | Philippine Rice Research Institute |
| **PHP** | Philippine Peso |
| **PIS** | Private Irrigation System |
| **PLA** | Public Land Act |
| **PPP** | Purchasing Power Parity |
| **PSA** | Philippine Statistics Authority |
| **PSE** | Producer Support Estimate |
| **QGFB** | Quedan Guarantee Fund Board |
| **QR** | Quantitative Restrictions |
| **R&D** | Research and Development |
| **RA** | Republic Act |
| **RDP** | Regional Development Plan |
| **RSBSA** | Registry System for Basic Sectors in Agriculture |
| **SALT** | Sloping Agricultural Land Technology |
| **SCT** | Single Commodity Transfers |
| **SEARCA** | Southeast Asian Regional Center for Graduate Study and Research in Agriculture |
| **SEPO** | Senate Economic Planning Office |
| **SPS** | Sanitary and Phytosanitary |

| | |
|---|---|
| **SPS-IC** | Sanitary and Phytosanitary Import Clearance |
| **SRA** | Sugar Regulatory Administration |
| **SWIP** | Small Water Impounding Project |
| **TFP** | Total Factor Productivity |
| **TRP** | Tariff Reform Programme |
| **TRQ** | Tariff-Rate Quota |
| **TSE** | Total Support Estimate |
| **UN** | United Nations |
| **UNFCCC** | United Nations Framework Convention on Climate Change |
| **US** | United States |
| **USAID** | United States Agency for International Development |
| **USD** | United States Dollar |
| **VAT** | Value Added Tax |
| **WARA** | Weather Adverse Rice Areas |
| **WB** | World Bank |
| **WDI** | World Development Indicators |
| **WEF** | World Economic Forum |
| **WFP** | World Food Programme |
| **WTO** | World Trade Organization |

# Executive summary

Agriculture is a key sector for the Philippines, at almost one-third of total employment and one-tenth of GDP. Agricultural land resources are under strain from frequent natural disasters, rising population and urbanisation; climate change is projected to have a significant impact on land use and yields.

Despite the Philippines' recent economic success, the agricultural sector lags behind other Southeast Asian countries in terms of production and productivity growth. The Philippines halved the proportion of undernourished from 26% in 1990-92 to 12% in 2012-14, although this may have increased to 14% in 2014-16. Progress in reducing the absolute number of hungry people has been slow and the incidence of malnutrition remains high: stunting still affects close to 30% of children.

Key agricultural policy objectives have focused on food security and poverty alleviation through guaranteeing a stable supply of food at affordable prices. The goal of self-sufficiency in rice has driven a range of policy measures supporting rice producers and an increased share of rice in total production – in contrast to diversification towards higher value commodities typical of other countries in the region.

In 1988, the Philippines undertook an ambitious agrarian reform that covered close to three-quarters of the country's total agricultural land. By end-2015, the redistribution of land was almost complete, but property rights remain to be settled, with almost half of the reform beneficiaries still covered by collective ownership certificates. Various restrictions on land-market transactions and insecure property rights have limited on-farm investment and undermined the expected economic benefits of the reform. Over this period the total number of farms increased and the average farm size fell from 2.8 ha to 1.3 ha.

Agricultural policies in the Philippines are designed and implemented by a complex system of institutions. By number of staff the Philippines has one of the largest agricultural research systems in Asia, but related public expenditures have been low until recently and efficiency is hampered by the system's complex structure and narrow focus. The agricultural extension system and its financing suffers from lack of co-ordination between the Department of Agriculture (DA) and local governments; local governments lack incentives to spend on trained and qualified extension staff; a commodity-by-commodity approach dominates, limiting efficiencies; and the linkage to the research and development system is weak. This also represents a major challenge for implementing climate change adaptation actions at the local level.

The level of support to agriculture as measured by the share of policy-driven transfers from consumers and taxpayers in gross farm revenues averaged 25% in 2012-14, higher than the OECD average of 18% and highest among all emerging economies covered by the OECD support indicators.

Market price support (MPS) is the dominant form of support to Philippine producers. In addition to rice, substantial levels of support are provided to sugarcane and animal products, in particular through high import tariffs. The high level of MPS is an implicit tax on consumers and the food processing industry, at 25% on average in 2012-14. Analysis suggests that price support for rice increases undernourishment in the Philippines by 3.2 percentage points or 3.2 million people.

The level of total support, through market price support and budgetary transfers, to the Philippine agricultural sector in 2012-14 was equivalent to 3.3% of GDP, almost five times the OECD average of 0.7% and the second highest across all countries measured. This contrasts with the sector's relatively poor performance in productivity growth, highlighting the need for resources to be applied more effectively.

## Key policy recommendations

### *I. Improve agricultural policy performance to enhance the sector's long-term productivity growth*

#### *Re-focus the policy package to improve food security*

- Enhance diversification of production, consumption and income by taking away commodity-specific incentives.
- Gradually remove restrictions on rice imports.
- Replace the National Food Authority's (NFA) subsidised rice sales with conditional cash transfers and food vouchers.
- Transform the NFA into a market-neutral agency managing emergency stocks.

#### *Re-focus agrarian land policies from land distribution to securing property rights through land governance reforms*

- Establish confidence in land ownership rights.
- Enhance post-reform consolidation of farm operations.
- Develop a long-term strategy for farm restructuring.

#### *Focus budgetary support on long-term structural reform*

- Re-allocate budgetary transfers from variable input subsidies to support sustainable productivity growth in the long term.
- Improve supply chain connectivity.
- Avoid commodity-specific budgetary allocations.

#### *Re-orient agricultural knowledge systems*

- Improve the institutional design of agricultural research and development, agricultural education and extension services through diminished institutional complexity, stronger vertical and horizontal collaboration, reduced focus on rice and increased expenditures.
- Re-orient the focus of agricultural education and extension services to improve farm management skills.

### *II. Assess the effectiveness of current risk management tools and of alternatives to them*

- Adopt a holistic approach to risk management with a policy focus on catastrophic risks.
- Assess insurance and cash-transfer schemes that can encourage adaptive decisions.

### *III. Improve the agricultural sector's capacity to adapt to climate change*

- Make climate-adaptation policy objectives consistent across programmes and institutions.
- Develop clear guidance on climate-adaptation "tagging".
- Make sure that new infrastructure projects are "climate-proof".
- Provide reliable climate information to farmers.
- Encourage more efficient use of water.

### *IV. Improve agricultural institutions and governance systems*

- Strengthen institutional co-ordination between the DA and other relevant departments and institutions that implement programmes supporting agriculture.
- Strengthen transparency and accountability of publicly-funded programmes.
- Accelerate efforts to build a solid policy-relevant statistical system.
- Embed monitoring and evaluation mechanisms into the policy process.

# Assessment and policy recommendations

This *Review*, undertaken in close co-operation with the Philippine Department of Agriculture (DA), assesses the performance of agriculture in the Philippines over the last two decades, evaluates Philippine agricultural policy reforms and provides recommendations to address key challenges in the future. The evaluation is based on the OECD Committee for Agriculture's approach that agriculture policy should be evidence-based and carefully designed and implemented to support productivity, competitiveness and sustainability, while avoiding unnecessary distortions to production decisions and to trade. At the DA's request, the *Review* includes a special chapter highlighting key challenges to be addressed to improve the adaptive capacity of agriculture to climate change.

## 1. Environmental, economic and social context

With a territory of 0.3 million $km^2$, the Philippines is a mid-size country in terms of land area, but its marine water area of 2.2 million $km^2$ is about the 20$^{th}$ largest in the world. Its population of 100 million makes the Philippines the world's 12$^{th}$ most populous country. The population growth rate at 1.6% in 2014 is one of the highest in Southeast Asia. Around half of the population lives in rural areas. Population density is high, at 332 persons/$km^2$, close to that of Japan and Viet Nam.

### *The Philippines is relatively rich in water, but poor in land resources*

The Philippines has abundant water resources, but shortages and even drought can occur during the dry season in some regions, which can be further exacerbated by climatic events. Agriculture is the main user of freshwater. In 2009, the sector accounted for 82% of total freshwater withdrawals, almost entirely for irrigation and animal production.

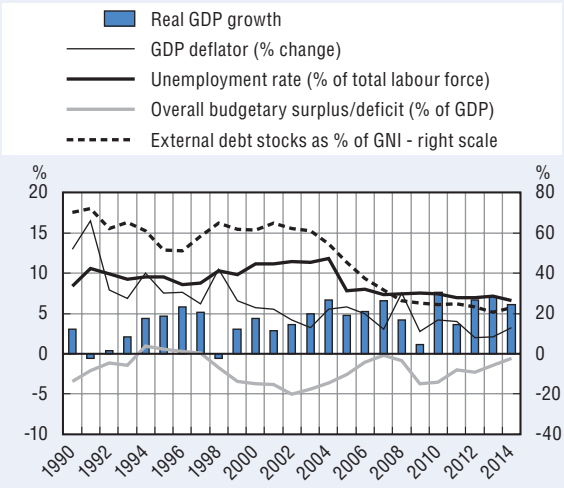
Mostly due to deforestation, agricultural land increased by 11% since 1990 and in 2012 covered 12.4 million ha, 42% of the Philippines' land area. However, as the population increased by 54% over the same period, land availability per capita declined and in 2012 was just 0.13 ha, about one-sixth of the world average.

### *One of the most natural-disaster-prone countries in the world*

According to the 2014 World Risk Index, the Philippines has the second highest risk of natural disasters (after Vanuatu), which makes its agricultural sector one of the most vulnerable worldwide (UNU-EHS, 2014). The country is located along the Pacific Ring of Fire, a seismically active belt of volcanoes and tectonic plate boundaries. As it also sits astride a typhoon belt, the Philippines experiences a high frequency of natural disasters each year, placing a strain on capital stock, food security and social development (Chapter 3).

## Box 1. **The Philippines: Contextual information**

### Figure 1. **Main macroeconomic indicators, 1990-2014**




*Source*: ADB (2016), *Key Indicators for Asia and the Pacific 2016*; WB WDI (2016), *World Development Indicators*.

StatLink http://dx.doi.org/10.1787/888933451978

### Table 1. **Contextual indicators, 1995, 2014**

| | 1995 | 2014[1] |
|---|---|---|
| **Economic context** | | |
| GDP (billion USD in PPPs) | 202 | 691 |
| Population (million) | 70 | 100 |
| Land area (thousand km2) | 298 | 298 |
| Agricultural area (AA) (thousand ha) | 11 015 | 12 440 |
| Population density (inhabitants/km2) | 234 | 332 |
| GDP per capita, PPP (USD) | 2 897 | 6 902 |
| Trade as % of GDP[2,3] | 67 | 46 |
| **Agriculture in the economy** | | |
| Agriculture in GDP (%) | 22 | 11 |
| Agriculture share in employment (%) | 44 | 30 |
| Agro-food exports (% of total exports)[3] | 11 | 11 |
| Agro-food imports (% of total imports)[3] | 9 | 13 |
| **Characteristics of the agricultural sector** | | |
| Crop in total agricultural production (%)[4] | 63 | 65 |
| Livestock in total agricultural production (%)[4] | 37 | 35 |
| Share of arable land in AA (%) | 48 | 45 |
| Agriculture share of total energy use (%) | 0.4 | 0.7 |
| Share of agriculture in water consumption (%) | .. | 82 |

1. Or latest available year.
2. Ratio of the sum of exports and imports to GDP.
3. 1996 instead of 1995
4. 2000 instead of 1995.

*Source*: OECD statistical databases; WB WDI (2016), *World Development Indicators*; UN (2016), *UN Comtrade Database*; FAOSTAT (2016).

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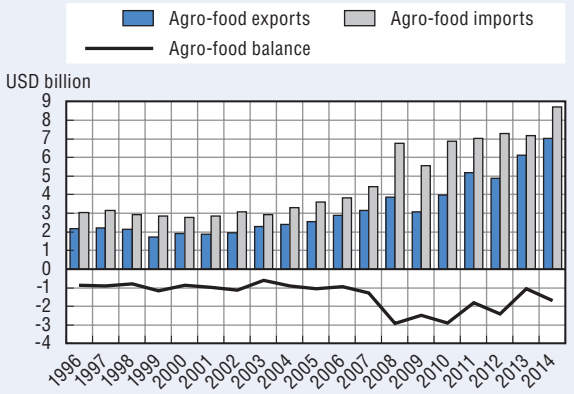
### Figure 2. **Agro-food trade, 1996-2014**

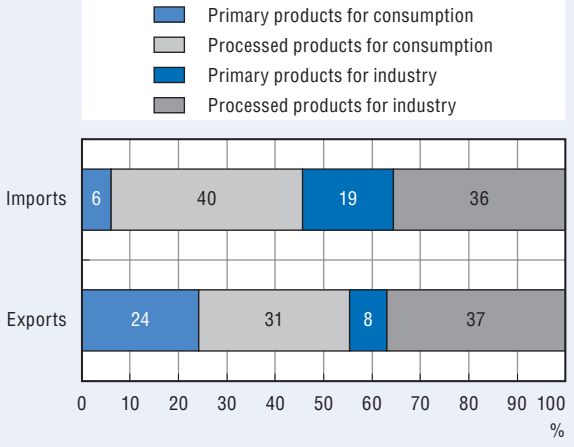



*Note*: Agro-food trade includes fish and fish products.

*Source*: UN (2016), *UN Comtrade Database*.

StatLink http://dx.doi.org/10.1787/888933451981

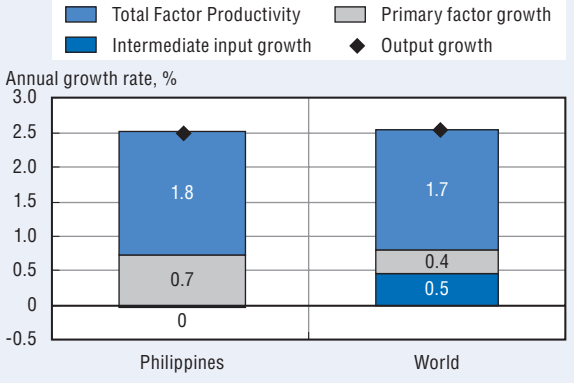
### Figure 3. **Composition of agro-food trade, 2010-14**




*Source*: UN (2016), *UN Comtrade Database*.

StatLink http://dx.doi.org/10.1787/888933451992

### Figure 4. **Composition of agricultural output growth, 2003-12**




*Source*: Fuglie and Rada (2015).

StatLink http://dx.doi.org/10.1787/888933452004

### *Sound macroeconomic environment*

The Philippine economy has proven to be resilient under many pressures – financial crises, climatic upheavals and fluctuations in commodity prices. The country experienced unprecedented economic decline under Ferdinand Marcos in the 1980s. It changed course after Corazon Aquino was elected in 1986, but experienced hardship in 1990-91 and again in 1998 during the Asian Financial Crisis (Lim, 2006). The economy achieved robust rates of growth over 2003-07, but just 1.1% in 2009 due to the global economic crisis of 2008-09. However, the Philippines rebounded strongly in 2010 and, unlike many other members of the Association of Southeast Asian Nations (ASEAN), sustained the rebound in subsequent years, growing at 6.5% annually over 2012-15.

The country's Gross Domestic Product (GDP) was USD 284.6 billion in 2014, which translates into USD 2 873 in per capita terms at the 2014 annual average exchange rate. Its Gross National Income (GNI) per capita of USD 3 500, using the World Bank Atlas conversion method, places the Philippines in the World Bank category of lower middle-income countries (WB WDI, 2016). Higher GNI than GDP in per capita terms is partly driven by substantial remittances from about 10 million overseas workers.

The Philippines is the third-largest recipient of personal remittances in absolute terms (USD 28.4 billion in 2014) after India and the People's Republic of China (hereafter "China"), and is the leader in per capita terms (WB WDI, 2016). Remittances have accounted for around 10% of GDP since 2011. Remittances drive consumption growth and are integral to the economy's stability; however, they may also create a culture of dependence and thereby provide a disincentive for productivity growth in the local economy (Nicolas, 2013). The inflow of remittances is a major contributor to the current account surplus and is also one of the drivers of the ongoing real appreciation of the peso. While in nominal terms Philippine Peso (PHP) appreciated from about PHP 55-58 per USD in late 2005 to about PHP 47 per USD in mid-2016, its real value increased by much more, taking into account the higher inflation rate in the Philippines than in the United States.

The appreciating peso has multiple consequences, including for the agricultural sector. Because holders of pesos have to pay less for imported commodities, the price competitiveness of domestically-produced goods declines. This enhances imports and exerts pressures on export-oriented sectors, thus contributing to a negative balance of trade, including in the agro-food sector.

### *Poverty rates have fallen*

Economic growth helped cut the poverty rate from 27% in 1991 to 13% in 2012, as measured by the World Bank poverty definition of USD 1.9 at purchasing power parity per day per person. However, an additional quarter of the total population, while above the absolute poverty line, remains vulnerable to falling into absolute poverty if natural disasters occur or economic conditions deteriorate (WB WDI, 2016).

As in most countries, the poverty rate is much higher in rural than in urban areas. At the national poverty threshold, defined as the minimum income/expenditure required for a family or individual to meet basic food and non-food requirements, the national poverty rate in 2012 was 25%; 38% for farmers and 13% for the urban population (PSA, 2014).

### *Various forms of malnutrition persist*

The Philippines was one of the 13 countries honoured in 2014 by the FAO for their outstanding progress in reducing hunger and meeting the Millennium Development Goals hunger targets, having halved the proportion of undernourished from 26.3% in 1990-92

to 11.5% in 2012-14, although more recent assessment would suggest that the rate increased to 13.5% in 2014-16 (FAO, 2015). The country has yet to succeed in reaching the 1996 World Food Summit's (WFS) more ambitious target of halving the absolute number of hungry people by 2015 (FAO, 2014a): 13.7 million Filipinos still suffered from undernourishment in 2014-16 compared to 16.7 million in 1990-92, representing a fall of 18% (FAO, 2015). Moreover, the incidence of various forms of malnutrition remains very high. In particular, stunting still affects about 30% of children, both among 0-5 year olds and 5-10 year olds (PSA, 2015a). Among adults, concomitant problems of both under-nutrition and over-consumption exist. The proportion of adults with chronic energy deficiency has been declining and was 10% in 2013, but the share of those who are overweight and obese has been rapidly growing and had reached almost one-third of population in 2013 (FNRI, 2015).

The share of food in total household consumption expenditure provides an indication of food security: the lower the share, the greater the food security. Aggregate data show very little change from 43.6% in 2000 to 42.8% in 2012 (PSA, 2015a). On average, about half of food expenditure is on rice, indicating that Philippine households, in particular in low income brackets, are highly vulnerable to changes in rice prices. Per capita rice availability, used as a proxy for consumption, even increased from 103 kg in 2000 to 128 kg in 2009, before tapering off to 114-119 kg in 2010-13 (PSA, 2015b). Rice consumption is likely to fall further as the economy develops.

## 2. Agricultural policy trends and evaluation

### *Agriculture's share in GDP is declining, but it still represents almost one-third of total employment*

Despite the country's recent overall economic success, the agricultural sector is underperforming, lagging behind those of other Southeast Asian countries in terms of production and productivity growth rates. Low productivity within the sector has been the result of decades of underinvestment (or mis-directed investment in some cases), policy distortions, uncertainties linked with the implementation of agrarian reform and periodic extreme weather conditions.

Between 1990 and 2013, the volume of agricultural output in the Philippines increased by 73% – less than in Viet Nam, China, Indonesia, Malaysia, Thailand and India. The non-agricultural economy has grown substantially faster than the agricultural sector, pushing down agriculture's share in GDP from 22% in 1990 to 11% in 2014. Agriculture's share in total employment declined from 45% to 30% over the same period.

Yet, the agriculture sector's share in employment is almost three times its share in GDP, indicating relatively low labour productivity – one of the reasons for the low incomes of households dependent on farming. However, Philippine agriculture appears to have started shedding labour in absolute terms. While further analysis might be needed to better understand this new development, the importance of labour moving from agriculture to the non-agricultural sector in maintaining overall economic growth, increasing productivity and in reducing poverty cannot be overstated. Mobility of labour from the low-productivity agricultural sector to the higher-productivity non-agricultural sectors raises incomes for workers, contributes to higher incomes for families through the diversification of sources of income (including from remittances), raises the wage rate of agricultural labour remaining in the countryside as supply shrinks, and improves land and water availability for those who remain dependent on farming.

Food and beverage processing accounts for over 50% of the Philippines' total manufactured output. The value of food and beverage output quadrupled in 2009-13, thus becoming the main driver of overall manufacturing growth (Singian, 2014). However, the sector has been unable to develop strong linkages with local producers, as shown by its high dependence on imported ingredients.

### *Food self-sufficiency is a major goal of the government's agricultural policy*

The main agricultural policy objectives over the past few decades have focused on food security and poverty alleviation, to be achieved through guaranteeing a stable supply of food at affordable prices. Food self-sufficiency, particularly in rice production, has been the major policy goal of the government.

### *Three phases of policy reform*

Agricultural policy development since the 1970s can be divided into three stages:

- 1970-86: Heavy government intervention in agricultural markets. The government had monopoly control over trade in rice, sugar and maize. At the same time, high-yielding rice technology was developed. Through provision of input subsidies, farmers were encouraged to use new high-yielding varieties of rice as well as fertilisers and pesticides. Public spending was also increased (particularly on irrigation), financed by a mix of taxes on major agricultural exports and foreign loans. Over the period 1978-83, the Philippines achieved rice self-sufficiency and became a net exporter of rice.
- 1986-2000: Partial liberalisation. The private sector assumed a greater role in agricultural credit policy. Market interventions were reduced. However, the main instrument of agricultural policy remained the provision of input subsidies to farmers. The government adopted the Agriculture and Fisheries Modernization Act (AFMA) in 1997, which aimed at facilitating farmers' adjustment to changes in trade policy as a result of the accession to the World Trade Organization (WTO). One strategic objective of the AFMA was to transform Philippine agriculture from being resource-based to becoming technology- and market-driven. The AFMA made self-sufficiency in rice official government policy. Public expenditure on agriculture declined substantially in the late 1990s, due to the tight fiscal policies adopted in the aftermath of the 1997 Asian Financial Crisis.
- 2000 to date: Refocus on rice and substantial increase in, and re-allocation of, budgetary spending on agriculture. In the wake of the global food price crisis of 2008, budgetary expenditure on agriculture increased. The government concentrated on intensifying rice production enhancement programmes and on increasing public expenditures on irrigation and input subsidies to achieve self-sufficiency. The new National Development Plan for 2011-16 addressed the major challenges facing the agricultural sector, namely the high cost of agricultural inputs, inefficient supply chain and logistics systems, inadequate provision of irrigation infrastructure, a low rate of technology adoption, and limited access to formal credit. The Food Staples Sufficiency Program launched in 2011 retained the focus on rice and selected other staples, but shifted the emphasis away from input subsidies towards public services for agriculture like extension services and infrastructure (e.g. farm-to-market roads).

### *Agricultural policy instruments*

Agricultural policy objectives are mainly pursued through the use of price support, input subsidies and payments for the provision of services to agriculture generally (Box 2).

### Box 2. **Overview of agricultural policy instruments applied in the Philippines**

**Domestic policy instruments**

- *Price support measures*: Price support policy affects mainly rice and sugar. The rice price support policy is implemented by the National Food Authority (NFA) through the following mechanisms: support price, release price, government procurement, and import restrictions. The Authority may also accumulate buffer stocks of rice to stabilise consumer price levels and ensure adequate and continuous supply. Price support and market regulation of sugar is implemented through sugar production quotas and regulation of foreign trade.
- *Reduction of input costs, variable and fixed:* Input subsidies have traditionally been the main policy tools to achieve food self-sufficiency. From 2011, input subsidies for seeds and fertilisers have partly been replaced by roll-over schemes to encourage adoption of high-yielding seed varieties. The Rice Mechanization Program introduced in 2011 aims to improve production operations and reduce national average post-harvest losses by at least 5% by the end of 2016.
- *Credit programmes:* Credit is provided under the umbrella of the Agriculture Modernization Credit and Financing Program and is targeted mainly to small-scale farmers. The focus is on facilitating farmers' access to credit rather than providing credit subsidies.
- *Insurance:* Crop insurance is meant to become one of the key tools to increase the sector's resilience to risks. The area covered by various insurance schemes is still small, but increased four times over the period 2012-14 and in 2014 covered about 7% of total agricultural land. The system is fully dependent on the Philippines Crop Insurance Corporation, a government owned and controlled corporation under the DA.
- *Preferential tax policies*: Until December 2015, agricultural enterprises were exempted from the payment of import duties on all types of imported agricultural inputs, equipment and machinery, provided that the imported agricultural input or equipment is for the exclusive use of the importing enterprise. Domestic sales or imports of unprocessed agricultural commodities are exempt from value-added tax.

**General services provided to the agricultural sector as a whole**

- *Irrigation:* Over 2000-14, about a third of annual budgetary expenditure to support agriculture was dedicated to investments in irrigation, almost entirely for the benefit of rice producers.
- *Farm-to-market roads*: Construction and upgrading of farm-to-market roads is a priority infrastructure intervention due to their significant impact on increasing agricultural productivity and reducing postharvest losses.
- *Research and development*: The Philippines has a large agricultural research system, but the organisation of the system is complex, consisting of a multi-level institutional structure. Since 2010, government expenditure on agricultural research has increased substantially.
- *Extension services:* The extension system was devolved to local governments in 1991. It suffers from low levels of financing, fragmentation and falling numbers of extension staff as well as weak links to technology development.

**Trade policy instruments**

- *Tariffs*: Tariff protection remains the main tool of trade policy and until recently remained at a high level. Trade liberalisation has mainly occurred within regional trade agreements, particularly the ASEAN Free Trade Area. The simple average applied Most Favourite Nation (MFN) tariff on agricultural products was 9.9% in 2014. All tariff lines applied are ad valorem and range from 0-65%, with the highest applied to sugarcane. High protection is applied to sensitive products like rice, maize, pork and poultry meat, potatoes, onions, garlic and coffee.
- *Tariff quotas:* Tariff quotas are applied for 14 agricultural products, with in-quota tariffs ranging from 30-50% and out-quota from 35-65%.

Box 2. **Overview of agricultural policy instruments applied in the Philippines** *(cont.)*

- *Special treatment clause for rice*: When joining the WTO in 1995, the Philippines benefited from a special treatment clause (Article 5 of the Agreement on Agriculture) which allowed it to maintain quantitative restrictions on rice imports on the basis of food security until 2012. In return, the Philippines had to guarantee minimum market access in the form of a gradually increasing import quota (minimum access volume, MAV). The most recent extension of the MAV was requested in 2012. After two years of negotiations with the WTO, the Philippines was granted an extension on the condition that, after mid-2017, the Philippines would use tariffs only on rice imports.
- *Import licenses*: Import licensing is intended to safeguard public health, national security and welfare and to meet international treaty obligations. Licences are also used to establish and maintain import quotas (i.e. rice) and agricultural tariff quotas.
- *Sanitary and Phytosanitary Measures (SPS) and Technical Barriers to Trade (TBT)*: Imports of agricultural products, live animals, plants, their products and by-products must be accompanied by a sanitary, phytosanitary or health certificate from their country of origin and are subject to inspection upon arrival. Generally, only SPS considerations are taken into account when issuing certificates; however, in some cases, the level of domestic supply is also considered (WTO, 2012), presumably leading to alleged discriminatory treatment due to non-research based requirements, mainly for animal products' imports.
- *Export controls:* Several agricultural commodities are subject to export controls and may require permits in addition to agency approval, namely rice, grains and grain products, sugar, molasses, muscavado, coffee, and live animals. Exports of rice and maize remain restricted and, in principle, controlled by the NFA.
- *Trade agreements:* The Philippines is a founding member of the ASEAN and the WTO. In addition to trade agreements concluded between ASEAN and key partners in the region (Korea, China, Australia, New Zealand and India), the Philippines has concluded a bilateral trade agreement with Japan.

### *The level of support to agriculture is relatively high*

Developments in agricultural policy can be assessed by changes in the level of support measured by the %PSE (Producer Support Estimate as a share of farmers' gross receipts) and the %TSE (Total Support Estimate as a share of GDP). Over the period 2000-14, the %PSE has fluctuated markedly, ranging between 11% and 27%. These variations are driven almost exclusively by changes in relative levels of domestic and international prices. The Philippine's %PSE averaged 25% in the three-year period 2012-14, indicating that one-quarter of gross farm receipts were generated by support policies. This was higher than the OECD average of 18% over the same period and highest among all emerging economies covered by the OECD support indicators. Compared to the other Asian countries, the level of support to producers in the Philippines is much lower than in Japan (52%) and Korea (50%), both high-income net importers of food products; it is relatively close to China (19%) and Indonesia (21%), both middle-income net importers of food; but it is more than eight times higher than in Viet Nam (3%), a strongly export-oriented country which is competitive in a wide range of crops.

The level of total support, both through market price support and budgetary transfers, to the Philippine agricultural sector in 2012-14, equivalent to 3.3% of GDP, is almost five times the OECD average of 0.7%, but just above that in China at 3% and slightly lower than in Indonesia at 3.4%. The high %TSE shows that for a developing country with a large agricultural sector, the cost of agricultural support to the economy can be very high. Such a high %TSE contrasts with the sector's relatively poor performance in terms of productivity growth and highlights the need to ensure that the money is spent effectively.

### *Price support and input subsidies dominate*

Market price support (MPS) is the dominant form of support to Philippine producers. The level and fluctuations of MPS for rice have a major impact on the level of and changes in the total MPS. This is due to the high share of rice in the total value of agricultural production and highly protective measures separating domestic prices for rice from those on international markets. Sugarcane and animal products are the other agricultural sectors that receive substantial market price support. Both sectors are protected through high tariffs. The price gap for coconuts was negative throughout the period 2000-14, mainly due to poorly functioning marketing channels and poor infrastructure.

The high level of MPS is reflected in the implicit tax on consumers and the food processing industry as measured by the %CSE (Consumer Support Estimate as a share of consumption expenditures). In 2012-14, the Philippine's %CSE averaged -25% which indicates that policies to support farm prices increased consumer prices by 25% on aggregate.

Budgetary support to agricultural producers, both payments provided to farmers individually and to the agricultural sector as a whole (general services), as a ratio of agricultural value added is low at 0.05, slightly higher than in Indonesia at 0.03, but almost five times lower than the OECD average at 0.23 in 2012-14. Over the whole period under study, budgetary support was primarily provided in the form of input subsidies. During the 2000s, expenditures were mainly allocated to subsidise use of variable inputs, such as high-yielding seeds, fertilisers and other agricultural inputs. Since 2011, the importance of subsidies for farm mechanisation has greatly increased, both in absolute and relative terms. Expenditures on general services started to rise sharply at the end of the 2000s. The most important item is the development and maintenance of infrastructure, of which a major share is devoted to investments in irrigation systems. Expenditure on agricultural knowledge and innovation systems is the second most important item in general services.

## 3. Key challenges

### *Productivity growth lags behind other countries in the region*

Throughout developing Asia, a change in the composition of agricultural output has been driven by a growing demand for animal products and high-value crops (Briones and Felipe, 2013). A shift from low-value commodities to those offering higher returns or occupying less land area is contributing to higher productivity and higher farmer incomes. This trend is apparent in developing Asian countries across a diversity of crops, but not in the Philippines, largely due to a set of distortive policies driven by the self-sufficiency objective in rice production (WB, 2007). The share of rice in the total value of agricultural production in the Philippines actually increased from 16% in 1991 to 22% in 2013 (FAOSTAT, 2016).

Labour productivity in agriculture is only one-sixth of that in industry, dragging down the overall average across the economy. Progress made by the Philippines in farm labour productivity is the slowest among major Asian peers. In terms of the level of productivity per farm worker, the Philippines ranked second just after Malaysia in 1990, but had been overtaken by China and Thailand by 2012. In 2012, Malaysia's labour productivity was 6.2 times that of the Philippines and China's was 1.4 times higher – an indication of differing levels of infrastructure, technology, mechanisation and investment in workforce skills and training (Fuglie and Rada, 2015). However, as agriculture in the Philippines has started to shed labour in absolute terms, there might now be an opportunity to accelerate internal restructuring of the farming sector and thus to enhance productivity growth, in particular if policies allow for more flexible reallocation of land resources across farms and crops.

Land productivity in the Philippines increased by 61% in 1990-2012, slightly more than in Thailand (56%), but less than in China (114%), Viet Nam (86%), Malaysia (77%), India (73%) and Indonesia (63%). In terms of the value of agricultural production per unit of land, the Philippines still performs well, at USD 1 529/ha in 2012 – better than Indonesia, Thailand and India. However, its relative position has been declining over the last three decades: currently, China, Malaysia and Viet Nam all outperform it (Fuglie and Rada, 2015).

Reflecting slow progress in land and farm labour productivity, performance in total factor productivity (TFP) has been weak, increasing by 39% in 1990-2012, an average of 1.5% per year. The Philippines ranks just below India and is well behind China, where TFP more than doubled over the same period (Fuglie and Rada, 2015). However, some progress occurred in the last decade, with the annual rate of growth accelerating to 1.8% in 2003-12, slightly above the world average (Box 1, Figure 4).

### *The agro-food sector's integration with international markets is weak*

The Philippines remained a net importer of agro-food products during 1996-2014. The agro-food sector remains relatively weakly integrated with international markets. In 2012-14, the average ratio of agro-food exports to agricultural GDP was 19%, while that of agro-food imports to agricultural GDP was 25%. Both ratios are similar to those for the whole economy, indicating that this relatively weak openness is not sector-specific, but rather typical for the Philippine economy.

Although the overall integration of the Philippine agro-food sector with the world market is weak, the country is a major exporter of some products. For example, the Philippines accounted for 67% of global exports of oil cake from coconuts, 43% of coconut oil, 18% of prepared pineapple, 15% of pineapple juice, 10% of bananas, and 10% of pineapples in 2012-14 (UN, 2016).

The Philippines' agro-food imports consist of two major groups: feed for animal production and products to meet food demand from domestic consumers (wheat, dairy products, beef, rice in some years) and for further processing. More than half of imports go to the domestic food and beverages processing industry (Box 1, Figure 3). About 90% of the industry's output is consumed domestically (Singian, 2014). As yet, imports for further processing and then export are small in the Philippines.

### *Social and economic effects of the agrarian reform are mixed*

Central to the Philippine land tenure system for the last three decades has been the 1988 *Comprehensive Agrarian Reform Program* (CARP). Originally scheduled for completion in 1998, Congress extended the deadline to 2008 and, in 2009, CARP was extended again under the auspices of *CARP Extension with Reform* (CARPER), with completion set for mid-2014 (OG, 2014). CARPER has since lapsed and it is up to the Congress to decide whether or not another extension will be granted and for how long. The CARP defines agrarian reform as the redistribution of lands to farmers and regular farmworkers who are landless. The programme covers all public and private agricultural land, as well as any other land within the public domain suitable for agricultural purposes. The scope of land subject to redistribution has evolved over time, but an estimated 7.9 million ha of agricultural land were marked for redistribution in 2013, i.e. about three-fourths of total agricultural land and more than a quarter of the entire land area of the Philippines. By December 2015, the government had acquired and distributed almost 7.3 million ha of land, 92% of the total land subject to redistribution (DAR, 2016).

The redistribution of land within CARP/ER has almost been completed, but the property rights of beneficiaries remain unsettled. Conflicts frequently arise between previous owners and agrarian reform beneficiaries (ARBs), between landowners and leaseholders and between potential ARBs over competing claims for land. Conflicts between potential ARBs partly result from duplicating titles being provided by three agencies (Department of Environment and Natural Resources, Department of Agrarian Reform and Land Registration Authority under the Ministry of Justice) without close co-ordination. Moreover, at the end of 2015 almost half of beneficiaries were still covered by collective ownership certificates, with rights not yet distributed to individuals, limiting investment and credit opportunities (DAR, 2016). The economic and social effects of the reform are mixed. Evaluations vary depending on the criteria and the assessment method applied. A comprehensive review by the World Bank concluded that "CARP had a positive impact on poverty and growth. However, the available empirical evidence shows that the impact on poverty has been quite modest" (WB, 2009). This conclusion is largely in line with an earlier evaluation undertaken by the Asia-Pacific Policy Center (APPC, 2007). Moreover, some studies suggest that positive changes to the economic characteristics of the respondents were not necessarily attributable to CARP (Gordoncillo, 2012). Various restrictions on land-market transactions and insecure property rights have limited on-farm investment and undermined the expected economic benefits of the reform.

### *Farm structures are increasingly fragmented*

Largely due to the agrarian reform, the total number of farms increased by almost two-thirds and the average farm size fell from 2.8 ha in 1980 to 1.3 ha in 2012. Moreover, while the total number of farms under 1 ha increased more than four times, the number of those of above 10 ha more than halved (PSA, 2015c and DA, 2015).

While the legislation supporting agrarian reforms does not allow post-reform consolidation of land ownership, the government encourages consolidation of farm operations in order to take advantage of economies of scale and create field shapes and sizes conducive to mechanisation. Accordingly, the 2013 *Agricultural and Fisheries Mechanization Law* empowers the DA and the Department of Agrarian Reform (DAR) to carry out contiguous farming projects promoting farm land clustering (minimum size of 50 ha), farm development planning, and the promotion or strengthening of farming co-operatives. The 2015 *Sugarcane Industry Development Act* introduces a "block farm programme" to consolidate small farms into larger farms with a minimum area of 30 ha to take advantage of economies of scale.

Some ARBs are entering into Agribusiness Venture Arrangements (AVA) – contracts with agribusiness firms that can make farming for smallholders more economically viable. Their creation and functioning are strictly regulated. Moreover, in June 2016 DAR introduced new regulations to protect ARBs. While the new regulations are aimed at creating more equitable relations between ARBs and investors, there is a risk that this more restrictive legislation might diminish the incentive for private investors to transact with ARBs, thus denying ARBs access to private sector expertise, marketing channels and to resources that the government is not able to provide.

### *Pressures on natural resources risk reducing long-term production growth*

Rapid economic growth, combined with rising population, urbanisation and expanding agricultural production, are exerting massive pressure on natural resources. In particular, conversion of lowland agricultural land for residential, commercial and industrial activities has become a contentious issue.

With 60% of the population living along coastal low-land areas, urbanisation has become a threat to agricultural land. Uncertain land user rights and land conversion to non-agricultural (mainly urban) uses has led to farmer migration and expansion of agricultural land into upland lands, resulting in deforestation and soil degradation (NSCB, 1998 and Suarez and Sajise, 2010). Currently, the Philippines has the lowest percentage of forest cover of all Southeast Asian countries except Singapore (FAOSTAT, 2016). Although 15.8 million ha is defined as forest land, only 7.6 million ha is actually forested, accounting for 25% of the country's area. Less than 0.9 million ha is primary forest.

The vulnerability of agricultural systems is further aggravated by environmental deterioration, pollution and over-exploitation of natural resources and ecosystems. Land and forest degradation have reduced the productive potential of soils and disrupted the hydrological cycle of watersheds, resulting in accelerated soil erosion, and the silting of rivers and reservoirs.

### *Damage to agriculture due to extreme weather-related events is likely to increase*

The Philippines' greater susceptibility to typhoons, tropical storms and flooding than its regional neighbours partially accounts for its relatively poor agricultural growth performance. The severity and intensity of typhoons have increased in recent years. The annual damage to agriculture from typhoons, droughts and floods is estimated to have reached an equivalent of 3% of total agricultural output (WB, 2013a).

Climate models indicate that the future climate of the Philippines is likely to be warmer and wetter, but climatic impacts will vary regionally and across commodities. Land use and yields are projected to be particularly affected by climate change, and this is likely to result in lower growth of productivity and farmer income, increased disruptions to food supplies, and a greater likelihood of damage to agricultural assets and infrastructure, which will in turn bring higher restoration costs. Notwithstanding the uncertainty associated with long-term projections, it is likely that extreme rainfall events will become more frequent, particularly in the important agricultural regions of Luzon and Visayas. Increased rainfall intensity may trigger landslides and flooding of coastal areas and could cause crop and livestock destruction and a reduction in the availability and quality of land due to erosion and landslides. In turn, intensified drought, especially during El Niño years, could result in soil degradation and changes in water quality due to salt-water intrusion.

Various crops show different sensitivities to potential impacts from climate change. It is likely that the negative effects of climate change will be relatively small (about 5% fall compared to the baseline) for yields of bananas, sugarcane and rice, and coconut yields are even likely to increase by 2%. However, a strong decrease in rice yields is projected in the Luzon region and maize yields, already under heat stress, are projected to fall by about one-fifth by 2050 as a result of projected temperature increases of between 1.8 and 2.4°C (Thomas et al., 2015).

The existing regulatory and policy framework in the Philippines reflects a substantial awareness of the threats posed by climate change and the need to address them. Explicit climate change adaptation efforts have intensified since 2007, following the formation of a task force on global warming. In 2009, the Philippines adopted the Climate Change Law, followed by the 2010-2022 National Framework Strategy on Climate Change (NFSCC) and the 2011-2028 National Climate Change Action Plan (NCCAP). The two most significant documents outlining climate change adaptation priorities are the NCCAP and the Philippine

Development Plan (PDP). However, the Philippines' climate regulatory and policy framework aimed at increasing resilience of agriculture to climate change is shaped by the overarching objective of rice self-sufficiency. The strong focus on rice production restricts farmers' production choices, thereby actually limiting their adaptation capacity.

The prioritisation of climate change adaptation in the national policy framework is mirrored by an increase in funding sources at the international, national, sectoral and local levels. Although climate related appropriations are increasing each year, it is unclear whether this reflects more action on climate adaptation or simply a change in tagging guidelines, i.e. changes in the scope of Programs, Activities, and Projects (PAPs) defined as responsive to climate change adaptation and/or climate change mitigation.

## 4. Policy recommendations

The analysis undertaken in the *Review* suggests that Philippine agriculture might be entering a new stage of development characterised, among other things, by falling rice consumption per capita and a reduction in the total number of persons employed in agriculture. As the distribution of land under the agrarian reform nears completion and the macroeconomic environment remains strong, there may be an opportunity to re-focus policy settings centred on rice production and land distribution towards enhancing agricultural productivity growth, competitiveness, sustainability and adaptability to climate change.

While the recommendations below are focused on agricultural policy measures, key policy objectives, in particular food security and poverty alleviation, cannot be achieved through agricultural policy reforms alone. They will need to be accompanied by much wider reforms in education and health systems, labour markets, infrastructure development, well-functioning input and output markets, and improved governance systems. Such economy-wide reforms would improve the overall environment in which the food and agriculture sector operates and would enhance the effectiveness of agricultural policy reforms. The specific recommendations below are not exhaustive and should be interpreted as a starting point for government consideration, refinement and elaboration. In particular, choices will need to be made across this wide range of recommendations as to which policy actions can and should be implemented quickly, and which might be acted upon more gradually.

### *I. Improve agricultural policy performance to enhance the sector's long-term productivity growth*

#### *1. Re-focus the policy package to improve food security*

***Enhance diversification of production, consumption and income***. Over the last three decades, a wide range of trade and domestic agricultural policy measures have been focused on rice, resulting in an increased share of rice in land use and in the total value of agricultural production. While policies in many Asian countries are driven by a rice self-sufficiency objective, the reverse restructuring of farm production in the Philippines is unique in Asia. Diversification from rice production into high-value crops would: allow farmers to earn higher incomes from a given amount of land, thus improving their access to food; improve farmers' capacity to adapt to climate change; enhance agricultural productivity growth; and release resources to increase supply of higher value products for domestic and international markets. Overall, diversification would improve the food security of the country.

***Gradually remove restrictions on rice imports***. Analysis undertaken in this *Review* suggests that rice trade liberalisation would decrease the rate of undernourishment in the Philippines by 3.2 percentage points (or 3.2 million people) by improving access to rice by poor households. While the currently applied trade policy supports the incomes of net rice producers, it taxes the majority of households, who are net rice consumers. According to the Survey of Food Demand for Agricultural Commodities 2012, approximately 72% of all Philippine households and 34% of rice producing households are net rice consumers. Thus, despite the policy objective of improving food security by increasing rice self-sufficiency and by preventing the transmission of price risks from the world market onto the domestic market, the current rice trade regime is in fact contributing to a more permanent state of food insecurity in the Philippines. Removing quantitative restrictions on rice imports, as the Philippines is committed to do in 2017 under the terms of its WTO accession, and allowing the private sector to take full and permanent responsibility for rice imports would benefit consumers. This should be followed by a gradual reduction of import tariffs on rice. These reforms would reduce the focus on rice-biased policy, thus allowing farmers to respond to market signals, diversify farm production towards more value-added crops, improve farmers' capacity to adapt to climate change, and lower rice prices for consumers. Overall, such reforms would be pro-poor as many of the most vulnerable for whom food security is a concern would gain directly from lower rice prices. This approach should be supported by farm-level guidance provided by extension services and public investment in infrastructure to ease connections with new marketing channels for those who would opt for production diversification and by targeted income support for net rice producers likely to lose from lower rice prices.

***Replace the NFA's subsidised rice sales with conditional cash transfers and food vouchers***. Targeted safety nets are a key component of policy measures to enhance food security, as they provide an effective means of ensuring sufficient access to food by the poor. Safety nets provide flexibility to deal with the impact of the price rises on poor households without disrupting the market and in particular without interfering with price signals to farmers. Once a safety net mechanism is in place, transfers can be raised when prices increase and can be lowered when prices fall (OECD, 2012). Currently, a key policy measure to improve access to food is the NFA's rice distribution programme, based on the government-set price, below the domestic retail market price, but substantially higher than the international market price. The programme is costly and not well-targeted as rice is sold indiscriminately by accredited retailers and does not necessarily reach poor households. Moreover, it creates a negative incentive for a more diversified diet away from rice. A more efficient solution to improve food security and alleviate poverty would be to use safety net measures such as conditional cash transfers, as through the existing Pantawid Pamilyang Pilipino Program, and food vouchers. These programmes can be well-targeted to poor households, facilitate more diversified food consumption and do not require the government to procure and distribute rice. Moreover, the pro-poor effects of rice market reforms discussed above would potentially over time reduce the number of households eligible for support or the amounts transferred, thus diminishing the administrative and budgetary costs of the safety net.

***Transform the NFA into a market-neutral agency managing emergency stocks***. Considering high vulnerability of the Philippines to the effects of climate change, frequent natural disasters, the country's archipelagic setting and poor infrastructure, the role of emergency stocks of basic foodstuffs, in particular rice, located relatively close to areas most exposed to catastrophic events or to areas for which such events have the greatest potential to disrupt

supplies, cannot be overstated. While the NFA's storage capacity spread all over the country could be used for this purpose, its operation could be partly transferred to private agents under the supervision of reformed NFA. The process could be divided into three steps:

- A precondition for the success of the reform would be for the government to define the level of emergency stocks and their geographical location.
- The second step would be to engage the private sector in the NFA emergency stock system. The NFA would be the owner of the stock, would provide storage facility and would cover the storage costs. To secure the quality of stored rice through an appropriate rotation system, regular auctions would need to be organised to sell the rice and to replenish the stock to the desired level. Auction prices would differ regionally depending on transportation costs and local market conditions. Private agents, including importers, wholesalers and processors would participate. Private agents would be allowed to acquire the stocked rice on the condition that they replenish the stock with the same quantity of rice within a certain period. This system would enable lower budgetary costs through the elimination of the market intervention component from the NFA mandate and by limiting the level of stocks to emergency levels. Moreover, competitive sales and purchases of rice would lower storage costs.
- The third step could be transmitting the ownership of stocks to private agents, under predefined conditions and where feasible (where private storage demand exceeds the required levels of emergency stocks). The NFA would provide the storage facility, but the running cost of storage would be covered by private agents. The Singapore Rice Stockpile Scheme could provide an instructive example (Singapore Customs, 2016). The NFA could compel licenced private agents (in particular importers of rice and large private wholesalers), or incentivise them through the offer of free use of storage facilities, to store pre-determined quantities of rice in NFA-designated warehouses. The stockpiled quantities of rice would need to be constantly replaced with new stocks and would not be kept in the NFA-designated warehouses for more than a year. Each stockpile participant would be expected to rotate their stocks. The stocked rice would be owned by private stockpile participants, but the government, represented by the NFA, would have the right to acquire the rice with compensation in case of emergency events. Apart from the predetermined quantities of rice, the stockpile participants would also be allowed to keep their trading or excess stocks in their own or NFA warehouses. In this latter case, the NFA would continue to carry the facility, maintenance and operation costs.

### *2. Re-focus agrarian land policies from land distribution to securing property rights through land governance reforms*

***Establish confidence in land ownership rights***. Despite being aimed at promoting social justice, the agrarian reform brought numerous uncertainties, undermined investment incentives (including for adaptation to climate change) and lowered productivity growth. Following the near completion of the land distribution process under CARP/ER, the focus should be on securing property rights. The World Bank has developed a list of reforms which could be considered to speed up this process, including: a) acceleration of the process of administration and systematic adjudication of property rights in rural and urban land, plot by plot; b) harmonisation or unification of various legal frameworks for land to reduce overlaps between agrarian, forestry, mining, ancestral domain, watershed and other lands; and c) reducing the complexity of land administration by passing an effective Land Administration Reform Act and National Land Use Act (WB, 2015 and WB, 2016).

***Enhance post-reform consolidation of farm operations***. Agrarian reform has contributed to significant farm fragmentation. It is both a problem of scale and of economies of scale. Land distribution has created farms that are too small to generate a decent standard of living and this problem will become worse as incomes grow in the rest of the economy. Moreover, for most agricultural commodities, there are economies of scale that help reduce some categories of farm costs. Larger operational scale of farming becomes more valuable when farm labour becomes expensive and when there are options to mechanise to save labour. Flexible and responsive land markets would help allocate land across various categories of farms. While the legislation does not allow consolidation of land ownership, various initiatives helping consolidation of farm operations should be further encouraged, such as cluster farming, AVAs or "block farm programmes" within the sugar industry. Recent more restrictive regulations on AVAs to protect ARBs risk diminishing the incentives for private investors to transact with ARBs, so the impacts of these regulations should be monitored carefully. Other measures which would support farm consolidation include improving the availability of farm credit and the quality and accessibility of rural education, training and extension services. The latter would also speed the adoption of efficient larger scale production technologies.

***Develop a long-term strategy for farm restructuring***. The Philippines requires a long-term vision of farm restructuring to adjust to the relative and absolute decline in employment in agriculture. In this respect, the OECD's framework could help differentiate between types of farms and indicate relevant policy measures to address each type's particular needs (Brooks, 2012). Such a policy package could distinguish four groups of farms: those which need some assistance to become more competitive; those which need to diversify income sources within and outside agriculture; those leaving the sector for non-farm work; and those unable to adjust and for which a relevant safety net should be identified or developed.

### *3. Focus budgetary support on long-term structural reform*

***Reallocate budgetary transfers from variable input subsidies to support sustainable productivity growth in the long term***. While budgetary support to agriculture is relatively low, a large part of it consists of subsidies to variable and fixed inputs, potentially the most distorting type of support. The implementation of the Food Staples Sufficiency Program in 2011 phased out seed and fertiliser subsidies and replaced them with roll-over schemes; however, input subsidies are still considerable compared to other budgetary expenditures. Supporting the use of seeds, fertilisers, farm machinery and postharvest equipment, which are essentially private goods, does not improve resource allocation. Rather, it reduces farmers' incentives to improve efficiency and does not have a lasting effect on productivity gains. Sustainable productivity growth can be achieved by shifting budgetary support towards public investments in infrastructure, agricultural research, extension services and food safety.

***Improve supply chain connectivity***. Agro-food supply chains in the Philippines are interrupted by infrastructure gaps, which remain widespread, in particular in such areas as road and rail connectivity, and logistics and energy. Improved connectivity is essential to lower post-harvest losses, increase farmer income, increase farmers' incentive to produce, and for the creation of an efficient domestic market. The Philippine Development Plan 2011-16 recognised this issue and public spending on infrastructure increased substantially, but more needs to be done, including through further strengthening of the legal and institutional framework for public-private partnerships in infrastructure development.

Within resources allocated to support agriculture, expenditure for irrigation work might be converted from solely enhancing rice production to also mitigating flood and drought damage to the entire ecosystem and to farm-to-market roads, storage and marketing facilities.

***Avoid commodity-specific budgetary allocations***. A large part of the DA's budget consists of commodity-specific banner programmes. Such programmes contain various kinds of support, from the most distorting input support to investments in public goods. The approach of providing budgetary support by commodity distorts incentives and production choices. To ensure an effective allocation of resources and better adaptability to climate change, the commodity focus in budget allocations should be discontinued and be replaced with the broader provision of public goods.

### 4. *Re-orient agricultural knowledge systems*

***Improve the institutional design of agricultural research and development***. Investments in agricultural research and development enable the technological change that will result in productivity growth in the sector. Although in terms of number of staff, the Philippines has one of the largest agricultural research systems in Asia, the related budgetary expenditures have been low until recently and efficiency is further hampered by the system's complex structure and overly narrow focus. The organisation of agricultural research and development is complex, consisting of a multi-level institutional structure in which three departments have roles in technology creation. In terms of focus, although more than half of agricultural research agencies conduct research on crops, research and development on rice is privileged. Improving the institutional design, increasing expenditure on research and development while reducing its focus on rice could further contribute to much-needed productivity growth in agriculture and, thereby also to the Philippines' food security objective.

***Improve the institutional structure of agricultural education and extension services***. Knowledge gained through research has little value if it does not reach farmers, thus the efficiency of education and extension services is crucial. However, the Philippine agricultural extension system as well as its financing lacks co-ordination between the DA and local governments; local governments lack incentives to spend on trained and qualified extension staff; a commodity-by-commodity approach dominates limiting efficiencies; and the linkage to the research and development system is weak. The lack of co-ordination in extension services and fragmentation into commodity programmes also represents a major challenge for implementing climate change adaptation actions at the local level. While the importance of extension services is recognised by AFMA, further efforts should be made to consolidate these services to improve their capacity to transfer the knowledge and technologies created in research institutes to farmers. In particular, co-ordination on extension between DA, local governments, the Agricultural Training Institute and various state colleges and universities needs to be improved and the linkage to research strengthened.

***Re-orient the focus of agricultural education and extension services to improve farm management skills***. While the transmission of primary agro-technical knowledge is necessary, in particular for agrarian reform beneficiaries, the education and extension system should increasingly provide more holistic services and include such areas as: marketing skills, preparation of business plans, co-operation arrangements between farmers, and use of environmental-friendly methods of production.

### *II. Assess the effectiveness of current risk management tools and of alternatives to them*

***Adopt a holistic approach to risk management with a policy focus on catastrophic risks***. Different layers of risks in agriculture require different responses (OECD, 2011). Optimal risk management strategies for different risk levels suggest that government policies should not provide support to deal with normal risks, such as normal variations in production, prices and weather. Such risks should be managed by farmers themselves as part of normal business strategy, through the diversification of production or the use of production technologies which make yields less variable. Income-smoothing through tax instruments for business is also part of normal risk management (OECD, 2011). At the other extreme, infrequent but catastrophic events that affect many or all farmers over a wide area will usually be beyond farmers' or markets' capacity to cope. Examples of such risk where governments may need to step in include severe and widespread drought, severe typhoon, widespread flood or the outbreak and spread of a highly contagious and damaging disease. In between the normal and the catastrophic risk layers lies a marketable risk layer that can be handled through market tools, such as insurance and futures markets or through co-operative arrangements among farmers. The Philippines has strengthened its approach to risk management and risk financing in recent years. As risk exposure will likely increase in a changing climate, further efforts should be made to reduce the pressure for ad-hoc governmental assistance after disasters occur. Raising awareness about the procedures, responsibilities and limits of the government will reduce the government's implicit contingent liability and encourage individuals to adapt through risk-reduction measures. Facilitating good "start-up" conditions for the private sector – by providing information, regulation and training for the development of market-based risk management tools – will ease the financial burden on the government (OECD, 2011).

***Assess insurance and cash-transfer schemes that can encourage adaptive decisions***. The Philippines' crop insurance programme has many features that impede adaptive and efficient decision-making, including: high transaction costs, lengthy waiting periods for payouts, moral hazard opportunities and distortive subsidies for rice producers. Two alternative financial products that could resolve these challenges are (i) a hybrid product that combines the current crop insurance with an index-based insurance product and (ii) a disaster-linked cash transfer programme for low-income farmers. The first option – the hybrid product – would reduce transaction costs by standardising the distribution of payouts; ease liquidity-related barriers to adaptation (by providing partial cash injections based on losses recorded in satellite images); curb moral hazard by linking payouts to shocks at a more aggregate level; and eliminate crop-specific subsidies that encourage poorly-adaptive crop choices (WB, 2012). The second option – a disaster-linked cash transfer programme targeting low-income farmers – would also avoid the abovementioned distortions that discourage adaptation and productivity-enhancing decisions. By registering participants in advance and establishing a quick cash disbursement mechanism (possibly building on existing channels), disaster-induced disruptions to production could be reduced, thus strengthening resilience and enabling farmers to make better investments (WB, 2014, 2013b).

### *III. Improve agricultural sector's capacity to adapt to climate change*

Aligning agricultural policies with climate change adaptation objectives is key to increasing the sector's adaptation potential. Many of the recommendations discussed above are also important for increasing agriculture's resilience to climate change; in particular:

- production and income diversification to enlarge the scope of farmer choices to deal with climate change risks

- strengthening land rights to incentivise on-farm investment
- re-orientation of the agricultural knowledge system to better transmit research findings, including on climate change, to the farm level
- harmonisation of risk management with adaptation policies to enhance both individual and sector-wide resilience.

This section focuses on specific actions, more directly targeting adaptation to climate change. That said, some recommendations, such as those related to more efficient use of water, clearly also have wider benefits, including for productivity growth, food security and farm incomes.

***Make climate-adaptation policy objectives consistent across programmes and institutions***. The harmonisation of these objectives would help prioritise the most efficient adaptation actions. As a first step, the strategic adaptation priorities of the Philippines Development Plan and the National Adaptation Plan should be harmonised. Such harmonisation would help implementing bodies, including the DA, design more effective action plans to achieve stated objectives. Both the overarching objectives and action plans should be regularly updated to take into account new information about climate change.

***Develop clear guidance on climate-adaptation "tagging"***. The Philippines has made considerable efforts to increase the transparency of climate change expenditure. However, with increased flows of international and national funds for adaptation, there is a need for a well-designed methodology to enable prioritising the most needed and most cost-efficient adaptation actions. In particular, clear guidance on defining and identifying transfers supporting adaptation actions ("tagging") merits development.

***Make sure that new infrastructure projects are "climate-proof"***. Climate change should be considered in the construction of new infrastructure, but also while retrofitting existing installations. Climate-proof water- and road-networks will be crucial for the success of the Philippines' efforts to build the resilience of agriculture to the effects of climate change. Relatively small upfront expenditures and design changes have the potential to reduce much higher costs in the future. A wide range of adaptation measures exist for infrastructure, some of which entail specific actions now, while others aim to incorporate flexibility to adjust to future challenges. In particular, regulation on water drainage and the use of temperature-resistant materials while designing new roads can significantly increase the climate resilience of this key infrastructure. Incorporating information about expected weather extremes may also extend the lifespan of new investments. That said, not all existing infrastructure should be "retrofitted". In some cases, it may be cost-efficient to wait until the infrastructure reaches the end of its natural lifespan. For instance, in areas prone to long-term submergence of roads, relocating road facilities may be a better option than paving them.

***Provide reliable climate information to farmers***. Reliable climate information is essential to encourage farmers to undertake actions and investment to improve their resilience to natural disasters and better adapt to climate change. In particular, information on the nature and the probability of extreme events should be disseminated in a targeted and timely way and supported by clear guidelines on how to minimise damage to production.

***Encourage more efficient use of water***. Current irrigation practices remain inadequate to encourage more efficient use of water in response to climate change, in particular in regions likely to suffer from seasonal droughts. A positive feature of the national irrigation system is that farmers are obliged to pay an irrigation service fee (ISF) to cover the system's operation

and maintenance costs. However, the ISF is based on the size of irrigated area and not the amount of water used. Moreover, collection of fees depends mostly on the willingness of farmers to pay, which in turn is associated with their harvest in a given period and on their satisfaction with the provision of irrigation services. Thus collection rates are relatively low and are reported to have varied between 63% and 67% in recent years. The government should ensure that charges for water supplied to agriculture reflect all operation and maintenance costs and are based on actual usage. This would encourage farmers to apply water-efficient and water risk-resilient technologies and practices, including alternate wetting and drying, in particular in irrigated lowland rice. It would also ensure better quality irrigation services and would diminish ambiguity over the obligation to pay. Social and adjustment policies could be used to compensate the poorest farmers.

### *IV. Improve agricultural institutions and governance systems*

***Strengthen institutional co-ordination between the DA and other relevant departments and institutions that implement programmes supporting agriculture***. In the Philippines, agricultural policy objectives and measures to address various concerns in the agricultural sector are covered by numerous development plans and programmes. However, their implementation could be improved. Implementation issues with policy reforms are due partly to the very complex system of institutions involved in agricultural policy design and implementation, including four departments with their sub-units, agencies and councils, as well as numerous Government-Owned and Controlled Corporations created to implement policies in strategic areas. Fragmentation of the institutional setup results in weak co-ordination, unclear communication procedures, and heightens risks of corruption. Closer co-ordination between the DA and other relevant departments and institutions and clear upfront definition of their roles and responsibilities would also increase the effectiveness of climate-adaptive actions in agriculture.

***Strengthen transparency and accountability of publicly-funded programmes***. Over the past few years, the transparency of budgetary data has improved. Budgeted amounts allocated to publicly funded programmes are published on the website of the Department of Budget and Management. However, data on amounts actually spent are not available. Given the multiple institutions involved in agricultural policy implementation, it would be advisable to consolidate the data on actual budgetary spending on agricultural programmes in the Department of Agriculture, including currently unavailable data on programmes financed by the local governments. Transparency would improve the assessment of the total budgetary support provided to agriculture, the monitoring of sub-national government performance by the DA, and the co-ordination of funding to achieve stated objectives.

***Accelerate efforts to build a solid policy-relevant statistical system***. Reliable and timely statistics are required to evaluate the results of policy measures, to formulate policy responses and to build evidence-based policy mixes for the future. User-orientation of agricultural statistics has been improving in the Philippines, but there are still areas which need further attention. In particular, as land distribution is near completion, it will be important to assess its consequences. Results of the 2012 agricultural census provide a set of useful information, but data on farm structures in terms of actual land use pattern remains inadequate. As post-reform reallocation of land across farms is likely to accelerate, it will be important to capture this process through timely statistical information. Moreover, to prepare the Philippines to introduce less distorting policy measures, such as decoupled land or farm revenue payments, the country needs to start creating systems and databases such

as a credible land registry or databases with individualised farm revenue or income data. As agricultural land is under various pressures, timely and well-defined data on overall farmland versus urbanised area and forestland is necessary. Labour and demographic statistics may also need further improvement. For example, a flow of labour from rural to urban areas seems to be insufficiently captured by official statistics, as indicated by an apparent fall in the urbanisation rate.

***Embed monitoring and evaluation mechanisms into the policy process.*** A more comprehensive and coherent system of monitoring, analysing and reporting of agricultural policies would help analyse, assess and improve policy performance, including in terms of agriculture's adaptation to climate change. While DA's agricultural statistics unit has been integrated into the Philippine Statistical Authority, the DA should maintain close links with that unit and build strong relations with agricultural policy research and analytical institutions to analyse data for the benefit of agricultural policy makers.

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*Chapter 1*

# The agricultural policy context in the Philippines

*This chapter examines the key issues that have shaped the development of the agricultural sector of the Philippines over the last two decades. It provides a brief overview of political, demographic, macroeconomic and social characteristics of the country. It evaluates the performance of agriculture in terms of production, productivity and trade; discusses its social impacts in terms of employment, poverty and food consumption; outlines its environmental consequences; and finally analyses structural changes in the agro-food sector, including in upstream and downstream sectors.*

## 1.1. Introduction

Philippine agriculture has benefited both from the institutional reforms of the last six years and from a sound macroeconomic environment. However, agricultural productivity growth lags behind that of other Southeast Asian countries and remains a challenge. This is the result of decades of underinvestment in infrastructure, policy distortions, uncertainties linked with the implementation of agrarian reform and periodic extreme weather conditions. In contrast to its Asian neighbours, the Philippines is not taking advantage of a shift from low-value agricultural commodities to higher-value, more profitable and more land-efficient ones. This is largely due to distortive policies privileging low value commodities, in particular rice.

Agriculture appears to have started shedding labour in absolute terms, which may indicate that it is entering a new stage of development characterised by higher farm labour costs. Such an evolution is likely to accelerate internal restructuring of the farming sector, enhance adoption of productive new technologies, encourage larger farms and bring higher productivity and higher incomes. However, any such development would need to be supported by appropriate supporting policies, including to enable more flexible reallocation of land resources across farms and crops.

## 1.2. General characteristics of the Philippines

This section provides a short overview of the geographical, political, social, natural and economic landscapes which shape the environment for the agricultural sector in the Philippines. It then assesses the performance of the Philippines against various components of the Agricultural Growth Enabling Index, which allows for comparisons across 32 emerging economies.

### *Geography*

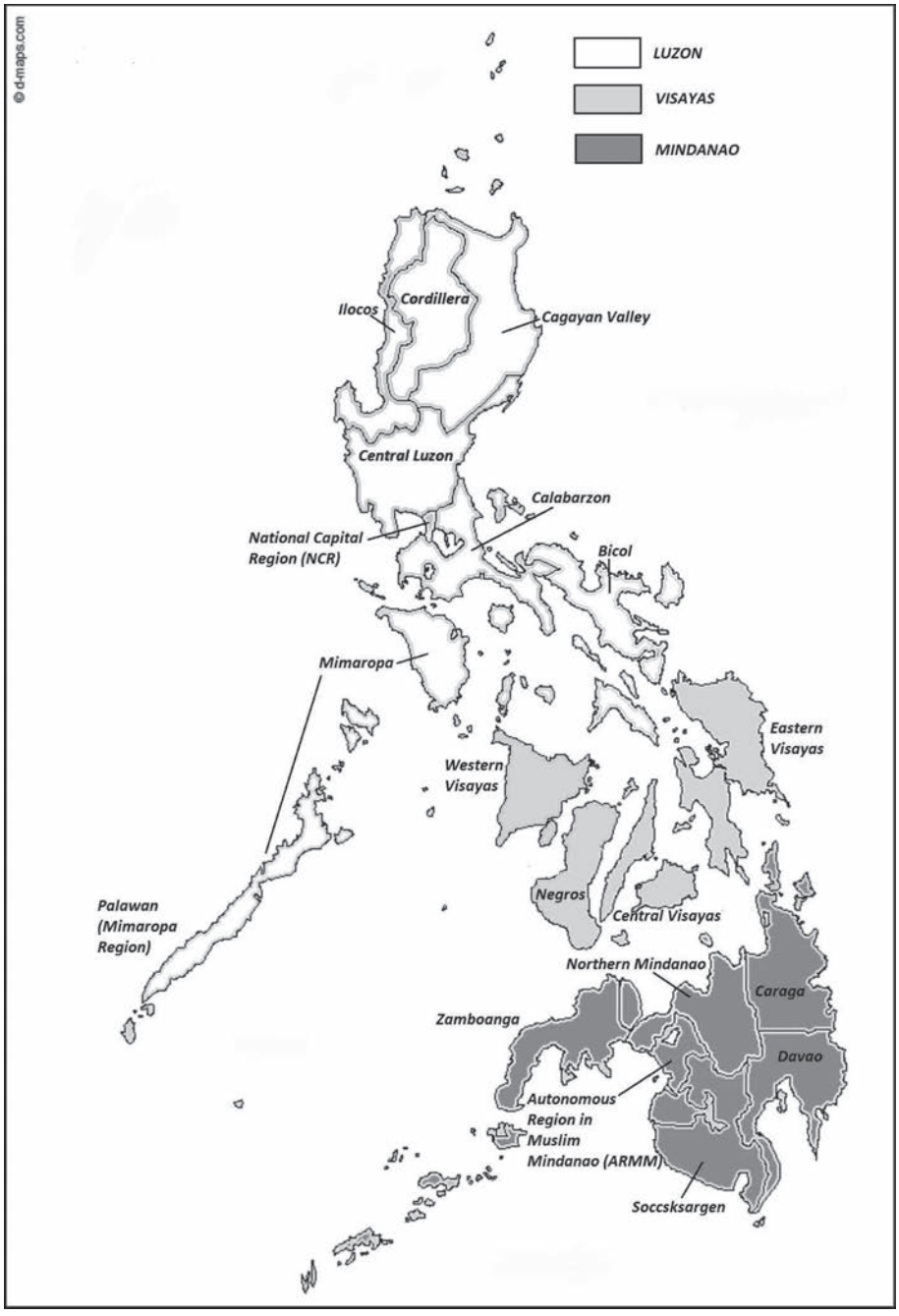
The Philippines is an **archipelago** consisting of 7 107 islands in the Pacific Ocean. It is situated among four seas: the South China Sea to the west, the Sulu and Celebes Sea in the south, and the Philippine Sea in the east. The Luzon Strait – an important passageway to East Asian ports – is located in the north. The country covers a total area of 300 000 $km^2$: 298 170 $km^2$ of land and 1 830 $km^2$ of water. While its land territory is 71$^{st}$ largest in the world (WB, WDI, 2016), its marine water area (including its Exclusive Economic Zone) of 2.2 million $km^2$ (FAO, 2014a) is about the 20$^{th}$ largest in the world.

The Philippine islands are divided into three groups: **Luzon** in the north, **Mindanao** in the south and the **Visayas**, situated between them (Figure 1.1). Luzon represents 47% of the overall land area (142 000 $km^2$), Mindanao 34% (102 000 $km^2$) and the Visayas 19% (56 000 $km^2$). Of the numerous islands, less than 1 000 are populated. The majority of islands have a land mass of less than 2.5 $km^2$ and eleven islands alone make up 94% of the Philippines' landmass (Dolan, 1991).

The Philippines has varied topography but is predominantly mountainous. It has 36 289 km of **coastline** – one of the longest in the world. Most of its population is concentrated near narrow coastal lowlands.

**Administratively**, the country is divided into 18 regions and 81 provinces that are further divided into 144 cities, 1 490 municipalities and 42 029 *barangays*, the smallest administrative units (PSA, 2015a). The Autonomous Region of Muslim Mindanao (ARMM) alone has its own elected Regional Legislative Assembly and its own government. Independent cities, although located within provinces, are not under the provincial government's jurisdiction.

Figure 1.1. **Map of the Philippines: Major groups of islands and regions**




*Source: http://d-maps.com/pays.php?num_pay=104&lang=en* edited by authors.

### *Basic political characteristics*

The **political landscape** of the Philippines changed in 1986 when the People Power Revolution ousted long-term President Ferdinand Marcos. Under his successor, Corazon Aquino, a Constitutional Commission was convened to ratify a new charter and, following a national plebiscite, the current constitution came into effect on 11 February 1987. The constitution established a democratic republic with three independent branches of government: executive, legislative, and judicial. It echoes the US Constitution in incorporating a Bill of Rights and in relying on a system of checks and balances to avoid absolute power and to secure equilibrium across the three branches of government.

In the **executive branch**, the president and vice president serve six-year terms, are elected separately by popular vote and need not be from the same political party. Pursuant to the 1987 constitution, the president can serve just one term, without the possibility of re-election, and the vice president can run for two consecutive terms. The president serves as commander in chief of the armed forces, head of state, and head of the government.

The Philippines has a **bicameral congress** (*Kongreso*) consisting of a Senate (*Senado*) and a House of Representatives (*Kapulungan Ng Mga Kinatawan*). The legal system of the Philippines reflects the different communities within the country and comprises civil, common, Islamic and customary law. The Supreme Court of the Philippines is the highest tier in the legal system.

### *Climatic conditions and natural resources*

According to the 2014 World Risk Index, the Philippines has the second highest **risk of natural disaster** worldwide which makes its agricultural sector one of the most vulnerable globally (UNU-EHS, 2014; Chapter 3). The country is located along the Pacific Ring of Fire, a seismically active belt of volcanoes and tectonic plate boundaries. As it is also located on a typhoon belt, the Philippines experiences a high frequency of natural disasters each year, placing a strain on capital stock, food security and social development (Chapter 3).

The Philippines has a tropical climate with both a wet and dry season. The country is divided into four climatic types based on **rain distribution**. Type I, predominately on the western side of the archipelago, experiences a dry season from November to April and wet season for the rest of the year. Type II areas, spread throughout the eastern side of the Visayas and Mindanao, experience no dry season and have pronounced rainfall from November to April. Type III areas' wet and dry seasons are not very pronounced: it is relatively dry from November to April and wet for the remainder of the year. Type IV experiences evenly distributed rainfall throughout the year. Type I, II and III are present in Luzon – all four climactic types are present in the Visayas and Type II, III and IV are present in Mindanao (Lantican, 2001).

The country has **abundant water resources**, but shortages and even drought can occur during the dry season in some regions, which can be further exacerbated by climatic events. An *El Niño* Southern Oscillation cycle can have drastic effects as it decreases the amount of rainfall over river basins, curtailing water flows into major water reservoirs that supply domestic use and irrigation systems (De La Cruz, 2014). Land use and yields are especially affected by *El Niño* cycles which are hard to predict and typically last between 14-22 months. *La Niña* cycles have the opposite effect: conditions are wetter than normal, intensifying monsoon rains and increasing the risk of flooding and mudslides (De la Cruz, 2014 and NDMC, 2015).

Approximately 14.2 million hectares (ha) (47.3%) of the Philippine territory consists of so-called **alienable and disposable land** (Section 1.8), used mostly for agricultural production, and the other 15.8 million ha (52.7%) is classified as forestland (PSA, 2015a), with the actual forest cover estimated at 7.6 million ha (FAOSTAT, 2016). Total **forest cover** has decreased almost 70% since the turn of the 19$^{th}$ century (Lasco et al., 2001). Deforestation has predominantly been driven by large-scale logging, followed by agricultural land expansion in the period 1970-90. To replenish forestland and provide time for proper regrowth, reforestation efforts began in 2011 with a National Greening Program (NGP) (Section 1.7).

### *Demographic factors*

With a **population** of 100.7 million in 2015, the Philippines is the 12$^{th}$ most populous country in the world. Its population density is high, and grew from 233 persons/km$^2$ in 1995 to 332 persons/km$^2$ in 2014, a density above that of Viet Nam and slightly below that of Japan (WB WDI, 2016).

The **Filipinos** are a unique blend of Malay, Chinese, Spanish, Negrito and American lineage, arising from centuries of intermarriage. Major ethnic groups are the Tagalog and Cebuano, respectively accounting for 24% and 10% of the total population. The Philippines has two official languages: the national language, Filipino, and English. Uniquely for Asia, the majority of the population (81%) identify themselves as Roman-Catholic (PSA, 2015a).

The Philippines has the second highest **population growth** rate among Southeast Asian countries: 1.6% in 2014, down from 2.1% in the early 2000s (WB WDI, 2016). Although the number of live births per woman has declined from 4.0 in 1990 to 2.9 in 2015, the Philippines still has the highest birth-rate per woman among all members of the Association of Southeast Asian Nations (ASEAN) (WB WDI, 2016). Both men and women are also living longer, which further contributes to population growth: life expectancy has increased from 68 years in 1990 to 72 years in 2013 for women and from 63 years to 65 years for men. The population is young overall, with around 32% below the age of 14 (WB WDI, 2016).

The Philippines is a major source of **migrant workers**. The total number of workers abroad, including permanent, temporary (called Overseas Filipino Workers, OFW) and irregular, is estimated at about 10 million, equivalent to approximately one tenth of the population.

With about half of Filipinos living in urban areas, the rate of **urbanisation** is just below the Southeast Asian average. This ratio compares with less than one-third in 1960 (Basingan and Ilagan, 2012). However, international statistics would suggest that the urbanisation rate actually fell from its peak at 49% in 1989 to 44% in 2014 (UN, 2014). This would mean that the natural increase in rural population has been faster than that in the urban population and that it has not been counterbalanced by migration from rural to urban areas. This would be unique among emerging and developing countries; however, it might also simply indicate some weaknesses of demographic statistics in the Philippines.

A fast-growing population combined with scarce agricultural land resources and ongoing land reform contribute to a highly **fragmented land tenure system**, with an average farm size of just 1.3 ha in 2012 (Section 1.8).

## *General features of the Philippine economy*

### *Changing structure*

The Philippines's **Gross Domestic Product** (GDP) was USD 284.8 billion in 2014, which translates into USD 2 873 in per capita terms at the 2014 annual average exchange rate. Its Gross National Income (GNI) per capita of USD 3 500, using the World Bank Atlas conversion method, places the Philippines in the World Bank category of lower middle-income countries (WB WDI, 2016). Higher GNI than GDP in per capita terms is partly driven by the significant volume of remittances from overseas workers (see below).

The Philippines is currently **transitioning** from a factor-driven to an efficiency-driven economy, according to the World Economic Forum's (WEF) classification (Table 1.1). Thus, the Philippines still needs to address four basic pillars for growth selected as key reform areas for factor-driven economies by improving institutions, infrastructure, the macroeconomic environment, and health and primary education. In addition, the Philippines increasingly needs to focus on efficiency enhancers of growth such as higher education; the operation of markets for goods and labour, and financial markets; and technological readiness (WEF, 2014a).

Table 1.1. **Economic stage of development for selected Asian countries**

| Stage 1: Factor Driven | Transition from Stage 1 to Stage 2 | Stage 2: Efficiency Driven | Transition from Stage 2 to Stage 3 | Stage 3: Innovation Driven |
|---|---|---|---|---|
| Cambodia | The Philippines | China | Malaysia | Republic of Korea |
| India | | Indonesia | | Japan |
| Laos | | Timor-Leste | | Singapore |
| Viet Nam | | Thailand | | |
| Myanmar | | | | |

*Source:* WEF (2014a), *Global Competitiveness Report 2014-15*.

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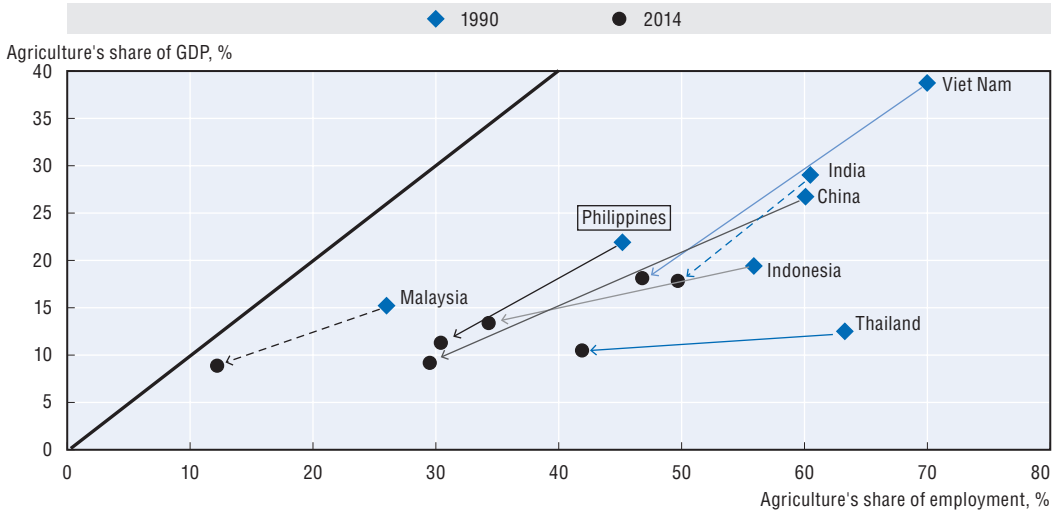
A constant feature of the process of structural change in all countries is that agriculture's share in employment and in GDP decline. This occurs as the percentage of income spent on food declines as incomes increase. Thus, policies to stimulate agricultural growth need to be careful not to distort the overall process of structural change.

In the Philippines, the share of **agriculture in GDP** halved from 22% in 1990 to 11% in 2014, and its **share in employment** fell by one-third from 45% to 30% over the same period (Figure 1.2). While this structural shift out of low-productivity agriculture to higher-productivity sectors is important, it is less prominent compared with most other countries of the region, in particular the People's Republic of China (henceforth "China") and Viet Nam (Figure 1.2).

Virtually all of the shift from agriculture in terms of value-added and employment has been to the **services sector**, the share of which in GDP increased from 44% to 57% and in employment from 40% to 54% in the period 1990-2014. Over the same period, manufacturing's share remained almost unchanged, at around one-third for GDP and at around 16% of employment (WDI, 2016). The Philippines is becoming a service-based economy, with the second-highest share of services in GDP among the ASEAN countries, next to Singapore (WDI, 2016). While the Business Processing Outsourcing leg of the services sector has grown exponentially and employs over a million high-skilled and well-paid workers, the overall services sector is still mainly comprised of low-skilled and informal workers (OECD, 2016).

Figure 1.2. **Evolution of agriculture's share in GDP and in employment in selected Asian countries, 1990-2014**




*Note:* The share of agriculture in total employment is 1994 instead of 1990 for India, 1996 instead of 1990 for Viet Nam, and 2013 instead of 2014 for India, Thailand and Viet Nam.
*Source:* WB (2016), *World Development Indicators*.

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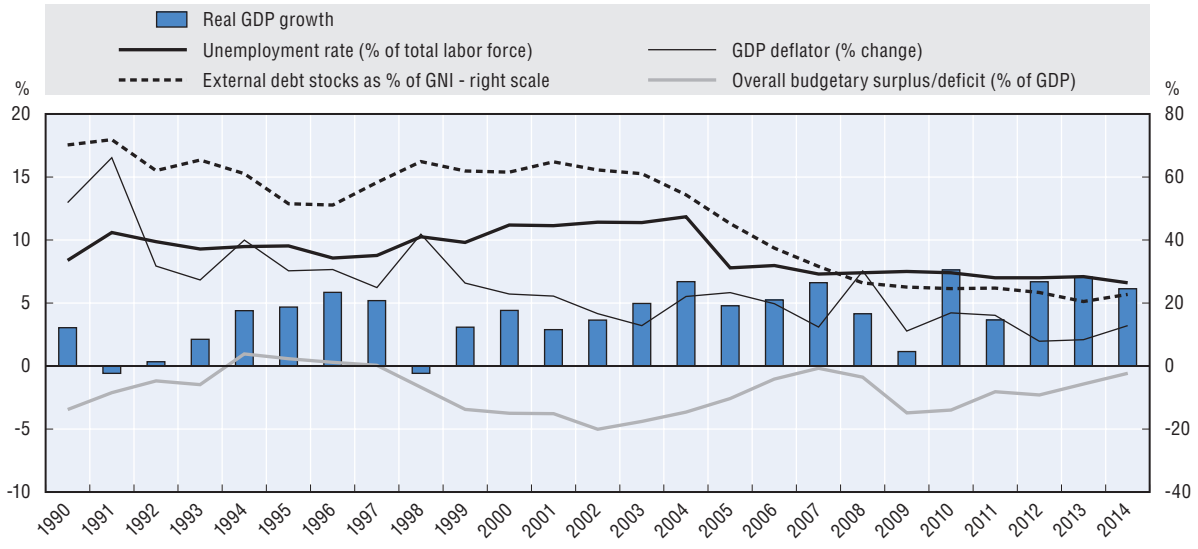
### *Macroeconomic performance*

The Philippine economy has proven to be resilient under many pressures – financial crises, climatic upheavals and fluctuations in commodity prices. The country experienced unprecedented economic decline and political uncertainty under Ferdinand Marcos in the 1980s, nearing economic collapse in 1984-85. The economy changed course after Corazon Aquino was elected in 1986, but experienced hardship in 1990-91 and again in 1998 during the Asian Financial Crisis (Lim, 2006). The Philippines achieved **robust rates of growth** in 2003-07, but of just 1.1% in 2009 in the wake of the global economic crisis of 2008-09 (Figure 1.3). The economy subsequently rebounded strongly in 2010 and, unlike many neighbouring ASEAN countries, sustained the rebound in consequent years, growing at 6.5% annually in 2012-15. Growth is expected to slow somewhat to 5.3% on average in 2016-20 (EIU, 2016).

In the past, the **inflation rate** (measured by GDP deflator) was stubbornly high, at above 5% or even 10% in some years. However, since 2002, it has moderated, with the exception of 2008 when skyrocketing commodity prices on international markets pushed inflation up to 7.5% (Figure 1.3). In recent years, monetary policy has been tightened to keep inflation within a target range of 3-5% (OECD, 2015a). Declines in the overall budget deficit to just 0.9% of GDP and in public debt to 44.7% of GDP in 2015 are other indicators of the considerable progress made in macro stabilisation (Figure 1.3 and EIU, 2016). **External debt** has also been reduced from 70.2% of GNI in 1990 to 22.7% in 2014 (WB, WDI 2016; Figure 1.3). Official international reserves stood at USD 79.5 billion in 2014, equivalent to 124% of total annual imports of goods (EIU, 2016) – a healthy buffer against external shocks.

The **unemployment rate** at 7.1% in 2013 is the highest among all ASEAN countries, China and India, and has remained steady at 7-8% for the past decade - albeit an improvement over the previous decade when it averaged around 10% (Figure 1.3). The International Labour Organisation (ILO) projects that between 2015 and 2030 nearly one million new jobs will need to be added each year to keep pace with the increase in the labour force and to maintain current unemployment rates (ILO, 2015). However, such job creation might not be sufficient to stimulate the shift of labour from agriculture to other sectors of the economy (Section 1.4).

Figure 1.3. **Selected macroeconomic indicators, 1990-2014**




*Source:* ADB (2016), *Key Indicators for Asia and the Pacific 2016*; WB WDI (2016).

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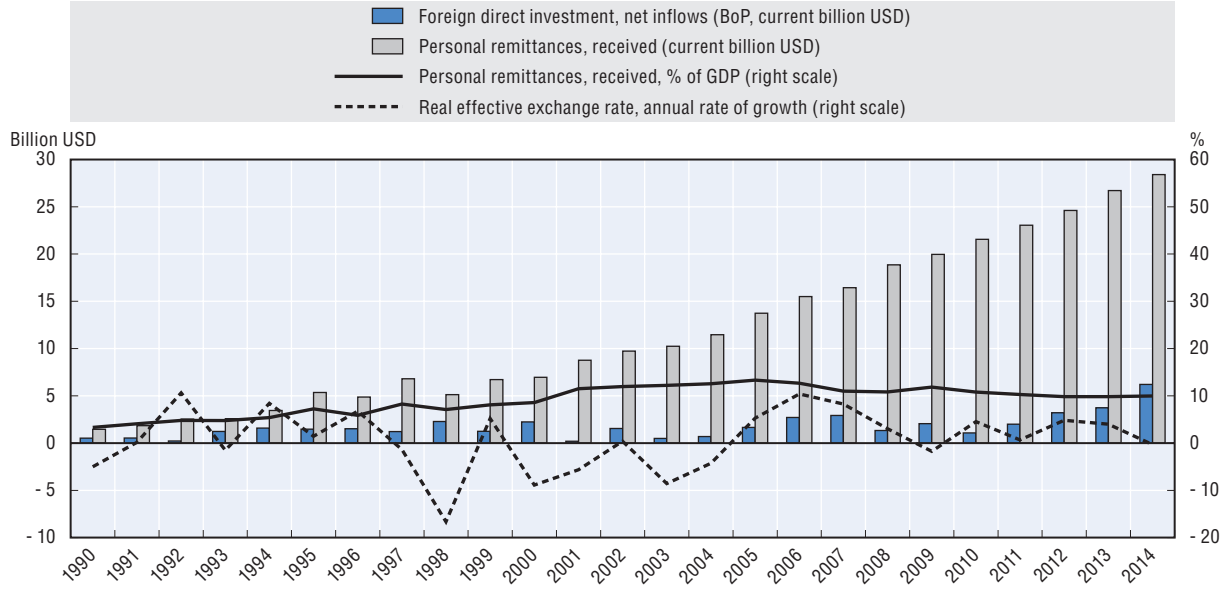
The Philippines is the world's third-largest recipient of personal **remittances** in absolute terms (USD 28.4 billion in 2014) after India and China, and is the leader in per capita terms (WB WDI, 2016). In GDP terms, personal remittances climbed from 3.2% in 1990, peaked at 13.3% in 2005, and have accounted for around 10% of GDP since 2011 (Figure 1.4). Remittances drive consumption growth and are integral to the economy's stability; however, they may also create a culture of dependence and thereby provide a disincentive for productivity growth in the local economy (Nicolas, 2013).

Figure 1.4. **Remittances and capital flows, 1990-2014**




*Source:* WB (2016), *World Development Indicators*.

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The inflow of remittances is a major contributor to the **current account surplus**, which stood at USD 10.9 billion in 2014, or 3.8% of GDP (WB WDI, 2016); it is also one of the drivers for the ongoing real appreciation of the peso, in particular since late 2004 (Figure 1.4). The Philippines applies a floating exchange rate regime, allowing the Philippine Peso's (PHP) value against other currencies to adjust to changing market conditions. While in nominal terms PHP appreciated from about PHP 55-58 per USD in late 2005 to about PHP 47 per USD in mid-2016, its real value increased much more, taking into account a higher inflation rate in the Philippines than in the United States.

The **appreciating peso** has multiple consequences, including for the agricultural sector. Holders of pesos have to pay less for imported commodities, resulting in declining price competitiveness of domestically-produced goods. This enhances imports and exerts pressure on export-oriented sectors, thus contributing to a negative balance of trade, including in the agro-food sector (Section 1.6).

### *Competitiveness and openness*

A sound macroeconomic environment, strategic location, large market, skilled human capital and young population all work to the advantage of the Philippines. The country ranks 47$^{th}$ out of 140 countries on the World Economic Forum's (WEF) 2015-2016 **Global Competitiveness Index** (GCI), behind regional neighbours Singapore, Malaysia, Thailand and Indonesia, but ahead of Viet Nam, Laos, Cambodia and Myanmar (WEF, 2015). The Philippines gained 38 places between 2010 and 2015 – one of the largest gains for all countries included in the Index over that time period – thanks in particular to institutional reforms which tackled corruption and promoted greater ethics, government efficiency and protection of property rights. Despite such progress, **inefficient government bureaucracy** and **corruption** remain among the most problematic factors for doing business. The Philippines also ranks poorly in terms of infrastructure (Section 1.9) and has made very little progress in labour market efficiency since 2010. The large number of procedures and days required to start a business also weigh on the Philippines' ranking, as does low trade openness (WEF, 2015).

Until the early 2010s, the Philippines' highly restrictive and complex investment regulatory regime deterred **foreign direct investment** (FDI), flows of which were two to three times higher in countries such as Viet Nam, Indonesia, Malaysia and Thailand (OECD, 2016). While the investment framework still needs to be improved, the Philippines' good macroeconomic performance has started to attract foreign investors, as indicated by a growing ratio of net FDI inflows to GDP from just 0.5% in 2010 to 2.2% in 2014 (WB WDI, 2016).

The Philippines' **trade openness**, measured as a ratio of traded goods and services (imports plus exports) to GDP, has slipped over the years. In 2005, trade openness stood at 98%, but by 2014 it had fallen to 61%, comparing unfavourably with the majority of countries in the region for which the rate ranged from 90% for Laos to 170% for Viet Nam. Only countries with even larger domestic markets had lower rates: 42% for China, 48% for Indonesia and 50% for India (WB WDI, 2016). Another measure of openness is the applied tariff across all imports. In compliance with WTO commitments, the weighted tariff was reduced from 14.7% in 1995 to 4.4% in 2010 (WB WDI, 2016). Tariff rates tend to be higher on agricultural products, with a simple average applied rate of 10.2% compared to 5.8% for non-agricultural products in 2011 (WTO, 2012; see also Chapter 2).

### *Social situation*

The Philippines ranks 115th out of 188 countries on the **Human Development Index** (HDI), a summary measure of health, education and living standards (UNDP, 2015). This ranking places the country in the medium human development category, below Malaysia, Thailand, China and Indonesia but above Viet Nam, India, Cambodia and Lao PDR.

Economic growth, even if weaker over the last two decades when compared with the best-performing Southeast Asian economies, helped diminish the **poverty incidence** from 27% in 1991 to 13% in 2012, as measured by the World Bank definition of absolute poverty of USD 1.90 at PPP/day/person (WB WDI, 2016). If a broader definition of poverty – USD 3.10 at PPP/person/day – is applied, poverty rates declined from 53% in 1991 to 38% in 2012. These rates show that even if progress in poverty reduction has been significant, one-fourth of the total population, currently above the absolute poverty line, remains vulnerable to falling back into absolute poverty if natural disasters occur or economic conditions deteriorate. Moreover, in absolute terms, the number of poor living at or below USD 3.10/day has remained stubbornly high, at about 34-38 million people, over the last two decades (WB WDI, 2016).

As in most countries, poverty incidence is much higher in rural than in urban areas. At the **national poverty threshold**, defined as the minimum income/expenditure required for a family or individual to meet basic food and non-food requirements, the national poverty incidence in 2012 was 25%: 38% for farmers and 13% for the urban population (PSA, 2014).

For all years for which data is available, **income inequality** as measured by the Gini coefficient has remained high, ranging from 42.9 in 1994 to 46.1 in 2000. The Gini fell to 43 in 2012, but remained second highest in the region, next only to Malaysia, and higher than in China and India (WB WDI, 2016).

The Philippines has made very impressive progress toward **gender equality**. The country ranks 9th in the world out of 142 countries in the World Economic Forum's **Global Gender Gap** report, which measures women's economic participation and opportunity, educational attainment, political empowerment, and health and survival (WEF, 2014b).

### *Enabling environment for agriculture*

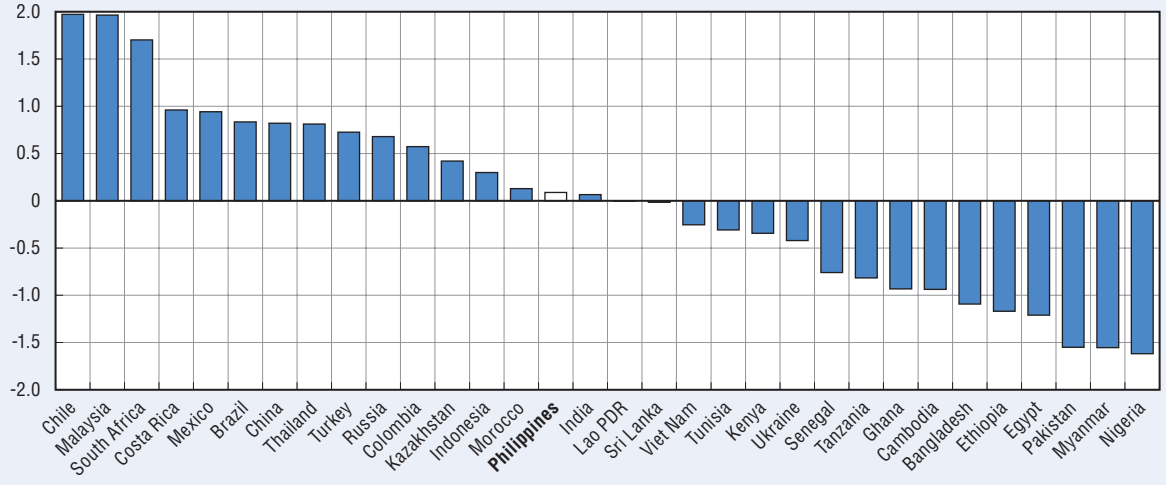
The **Agricultural Growth Enabling Index (**Box 1.1) quantifies the performance of various components of the enabling environment for agriculture and synthesises them into a single index. The Index has been applied to 32 countries, classified as factor-driven economies and efficiency-driven economies (as defined within the WEF's Global Competitiveness Index), including all major ASEAN countries. The Philippines appears in the middle of the index, slightly above the average. While it performs relatively well in the area of governance, driven largely by good macroeconomic performance, the Philippines' capital and agriculture/sustainability indices are slightly below average. Areas of particular concern are poor infrastructure, a poorly functioning labour market, low capital intensity and low land availability.

## Box 1.1. **Agricultural Growth Enabling Index**

To assess agriculture's enabling environment in a given country and to compare it with other countries, Diaz-Bonilla et al. (2014) constructed a preliminary Agricultural Growth Enabling Index (AGEI). The Index has been further developed by the OECD Secretariat to include sustainability components and to cover a wider range of countries. The Index structures a wide array of information to provide cross-country comparisons or single-country evaluations. It has been applied to 32 developing and emerging economies, including the Philippines. Relative scores on the AGEI overall are shown in Figure 1.5. The overall AGEI score for the Philippines is slightly positive (above average), ranking 15 out of 32 countries covered.

Further decomposition can be made both across and within the four key blocks of the AGEI (governance, capital, markets, and agriculture/sustainability). The Philippines performs relatively well on governance and markets, but below average on capital and agriculture/sustainability. Within governance, the Philippines performs well on macro stabilisation, somewhat worse but still above average on institutions, and below average on political stability. For capital, the Philippines performs slightly above average on human capital, as captured by health/education indicators, but poorly on infrastructure. For markets, the Philippines scores slightly above average on financial and goods markets as well as on the trade facilitation indicator, but poorly on labour markets. For agricultural/sustainability, the Philippines scores slightly below average, but results differ quite strongly between various sub-components: it scores particularly low on capital intensification, measured by the capital stock per person employed in agriculture, and on land availability per person employed in agriculture.

### Figure 1.5. **Agricultural Growth Enabling Index, 2010-14**




*Note:* The index is comprised of four blocks with 40% of the weight on agriculture/sustainability factors and 20% each on broader economy-wide governance, capital and market operation. The indicators selected measure circumstances within each country in the early 2010s. To account for the differences in averages of scores of the 32 countries and the variances of these scores across the index and its blocks, this figure shows the normalised score of each country on the AGEI index and on each component. Specifically, for the AGEI and each of its four blocks the average for the 32 countries has been subtracted from each country value and the resulting country value divided by the standard deviation for the series, to create series with zero mean and unit standard error. For example, a value of 2 means that the observation for a given country is 2 standard deviations above the average (which is zero) for the 32 countries.

*Source:* Diaz-Bonilla et al. (2014) and the OECD Secretariat.

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## 1.3. Agricultural situation

This section examines the importance of the agricultural sector, including the agro-food industries, to the economy, and assesses agriculture's performance in terms of output and structure.

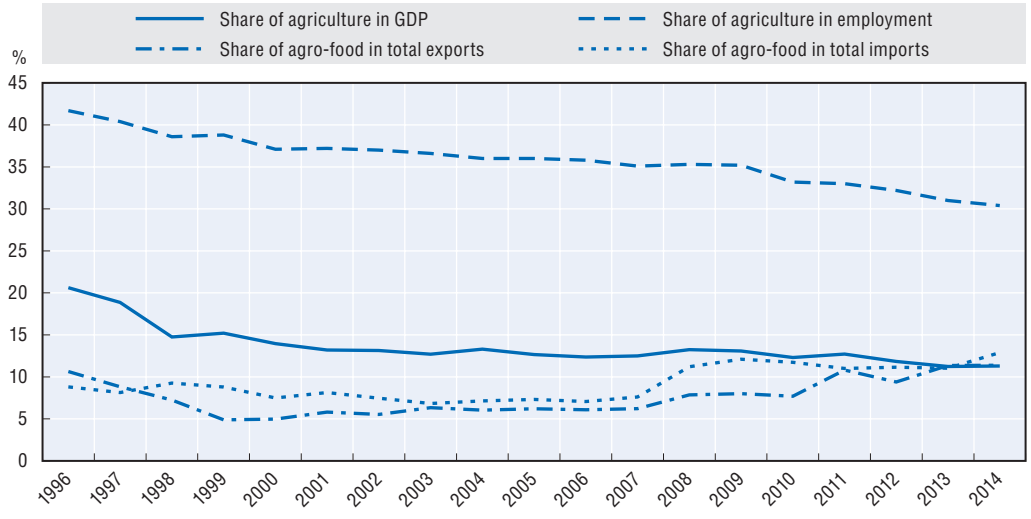
### *Agriculture and the food sector within the economy*

Despite the country's recent overall economic success, the **agricultural sector remains a challenge**, lagging behind that of other Southeast Asian countries in terms of production and productivity growth. Low productivity within the sector has been the result of decades of underinvestment, policy distortions (Chapter 2), uncertainties linked with the implementation of agrarian reform (Section 1.8) and periodic extreme weather conditions (Chapter 3; WB, 2015).

The non-agricultural economy has grown substantially faster than the agricultural sector, pushing down agriculture's share in GDP from 22% in 1990 to 11% in 2014. Agriculture's share in total employment declined from 45% to 30% over the same period (Figure 1.6). The agriculture sector's share in employment is almost three times its share in GDP, indicating relatively **low labour productivity** – one of the reasons for the low incomes of households dependent on farming (Section 1.5). The relative importance of agriculture varies strongly across regions, from zero in the National Capital Region's GDP to 63% of regional GDP in the Autonomous Region, Muslim Mindanao (ARMM) in 2014 (PSA, 2015a).

With the exception of a few commodities, the Philippines is not a major player in **world agro-food markets** and is a net-importer of agro-food products (Section 1.6). The share of agro-food exports (including fisheries) in total exports has varied between 5% and 10%, but has slowly grown since the late 2000s and exceeded 10% in 2013-14. The shares of agro-food imports in total imports have usually been a few percentage points above those for exports, but in recent years both shares have almost been equal, partly due to stronger agro-food export performance (Figure 1.6).

Figure 1.6. **The share of agriculture in GDP, employment, total exports and imports, 1996-2014**




*Source:* WB (2016), *World Development Indicators*; UN (2016), *UN Comtrade Database*.

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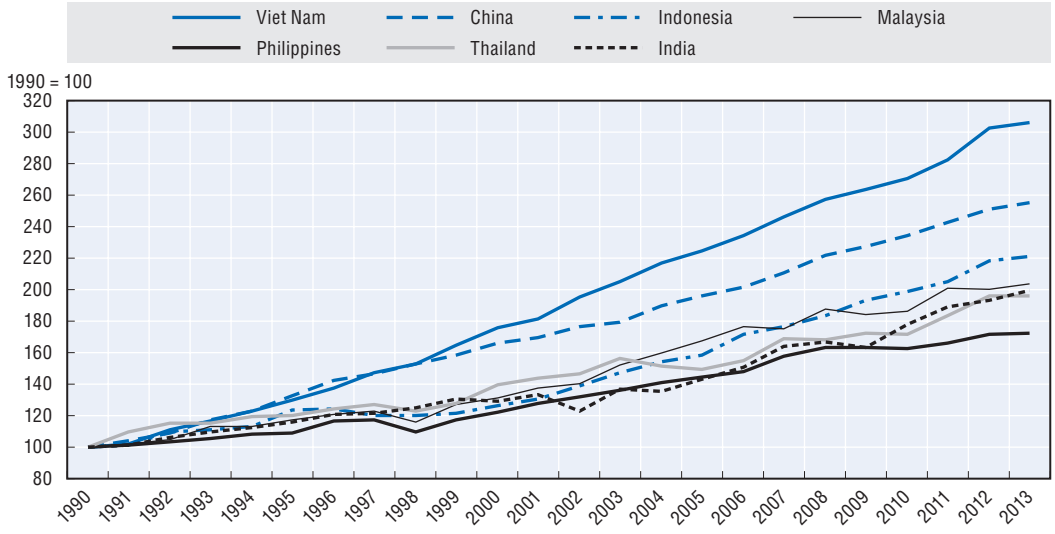
**Food and beverage processing** accounts for over 50% of the Philippines total manufactured output. The value of food and beverage output quadrupled in 2009-13, thus becoming the main driver of overall manufacturing growth (Singian, 2014). The sector is highly dependent on imported ingredients, which indicates relatively weak linkages between local producers and the downstream sector, including processing.

### *Farm output*

In terms of gross agricultural output (GAO) growth over the last two decades, the Philippines has **underperformed** compared to all its major partners in Asia. Between 1990 and 2013 the volume of agricultural output in the Philippines increased by 73% – less than in Viet Nam, China, Indonesia, Malaysia, Thailand and India (Figure 1.7). Crop output increased by 55%, but animal output performed much better, increasing by 163% over the same period (Figure 1.8).

Agricultural output experienced **setbacks** in selected years, in particular in 1998 (-6.8%), when *El Niño* caused severe drought, reducing crop output in 18 provinces, and in 2009-10 (-0.4%), when a series of typhoons resulted in thousands of human casualties, as well as significant agricultural losses and damage to infrastructure (UNOCHA, 2014). The Philippines' greater susceptibility to **tropical cyclones** partially accounts for its poor agricultural growth performance compared to its regional neighbours. The severity and intensity of these cyclones have increased in recent years. The annual damage to agriculture from typhoons, droughts and floods is estimated to have reached an equivalent of 3% of total agricultural output in the late 2000s (WB, 2013a; Chapter 3).

Figure 1.7. **Growth in gross agricultural output in selected Asian countries, 1990-2013**




*Note*: The FAO indices of agricultural production show the relative level of the aggregate volume of agricultural production for each year against the base period 2004-06. The indices are based on the sum of price-weighted quantities of different agricultural commodities produced after deductions of quantities used as seed and feed weighted in a similar manner. In this figure, indices based on the 2004-06 period have been recalculated taking indices for 1990 as 100.
*Source*: FAOSTAT (2016).

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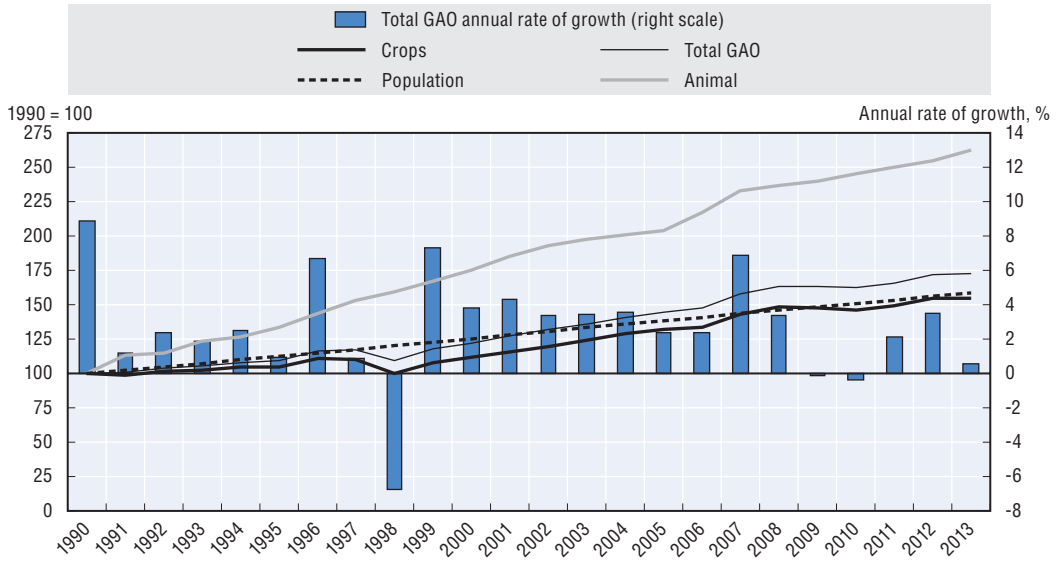
Figure 1.8. **Growth in agricultural output in the Philippines, 1990-2013**




*Source:* FAOSTAT (2016); WB (2016), *World Development Indicators*.

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Throughout developing Asia, a change in the composition of agricultural output has been driven by a growing demand for animal products and high-value crops (Briones and Felipe, 2013). A **shift** from low value commodities to those that can attract higher returns or occupy less land area can improve production and farmer income. This trend is apparent in developing Asian countries across a diversity of crops, but not in the Philippines, largely due to a set of distortive policies which favour low value commodities, in particular rice (Chapter 2).

Most notably, the **share of rice** in total value of agricultural production in the Philippines **increased** from 16% in 1991 to 22% in 2013 (Table 1.2). Other Asian countries have diversified and increased production of higher value crops, bringing the overall share of rice down over time.[1] Rice is by far the most important commodity for the Philippines and for developing Asian nations in general, but it does not earn as much per hectare as other crops. For example, in 2014, after all costs have been considered, one hectare of pineapples could earn over ten times more than a hectare of rice in the Philippines. Similarly, net returns per hectare from mango, onion and tomato production were all much higher than those for rice (PSA, 2015c).

Trends for **other products** have been mixed. The shares in total value of production of pig meat, chicken meat and chicken eggs have increased, while the shares of high value crops have declined (mangoes, tropical fruit, fresh vegetables, pineapples, coffee, sugar cane), grown little (onion, rubber) or remained stagnant (cassava). Among fruit and vegetables, only the share of bananas has increased (Table 1.2).

Figures 1.9 and 1.10 depict the relative **production performance** of major commodities in the period 1990-2013. Figure 1.9 shows that among crops, bananas were the best performers, with production increasing by 144%. Production of rice, mangoes and pineapples increased by 87%, 83% and 73% respectively, while sugarcane, coconuts and cassava showed the least growth.

Table 1.2. **Changes in the composition of the value of agricultural production, 1991-2013, %**

| | 1991 | 2000 | 2010 | 2011 | 2012 | 2013 |
|---|---|---|---|---|---|---|
| **Crops, including:** | **75.2** | **67.1** | **65.9** | **68.1** | **67.8** | **67.0** |
| Rice paddy | 15.7 | 20.4 | 19.1 | 18.9 | 21.5 | 22.4 |
| Bananas | 3.8 | 3.9 | 7.3 | 6.3 | 6.5 | 6.7 |
| Maize | 5.8 | 5.9 | 5.8 | 6.9 | 7.0 | 6.7 |
| Coconuts | 6.9 | 5.0 | 6.8 | 9.2 | 6.6 | 5.8 |
| Fruit tropical fresh nes[1] | 14.1 | 7.7 | 6.1 | 6.0 | 5.8 | 5.7 |
| Sugar cane | 7.6 | 7.2 | 6.8 | 6.4 | 6.1 | 5.7 |
| Vegetables fresh nes[1] | 7.8 | 5.5 | 5.4 | 5.3 | 5.3 | 5.2 |
| Cassava | 1.3 | 1.2 | 1.0 | 1.1 | 1.2 | 1.3 |
| Pineapples | 2.1 | 1.4 | 1.1 | 1.2 | 1.3 | 1.2 |
| Mangoes mangosteens guavas | 2.7 | 2.6 | 1.2 | 1.1 | 1.1 | 1.1 |
| Sweet potatoes | 0.7 | 0.5 | 0.4 | 0.4 | 0.5 | 0.5 |
| Coffee green | 0.9 | 0.7 | 0.4 | 0.4 | 0.4 | 0.4 |
| Tobacco unmanufactured | 0.9 | 0.3 | 0.3 | 0.3 | 0.5 | 0.4 |
| Onions dry | 0.2 | 0.2 | 0.3 | 0.5 | 0.5 | 0.4 |
| Rubber natural | 0.1 | 0.1 | 0.7 | 0.8 | 0.4 | 0.3 |
| **Livestock, including:** | **24.8** | **32.9** | **34.1** | **31.9** | **32.2** | **33.0** |
| Pig meat | 13.4 | 17.5 | 17.3 | 15.6 | 15.3 | 16.5 |
| Chicken meat | 5.1 | 7.8 | 8.7 | 8.5 | 9.0 | 8.5 |
| Eggs | 2.2 | 2.4 | 2.9 | 2.8 | 3.0 | 3.0 |
| Cattle meat | 2.0 | 3.6 | 2.6 | 2.5 | 2.4 | 2.5 |

1. Not elsewhere specified.

*Source:* FAOSTAT (2016).

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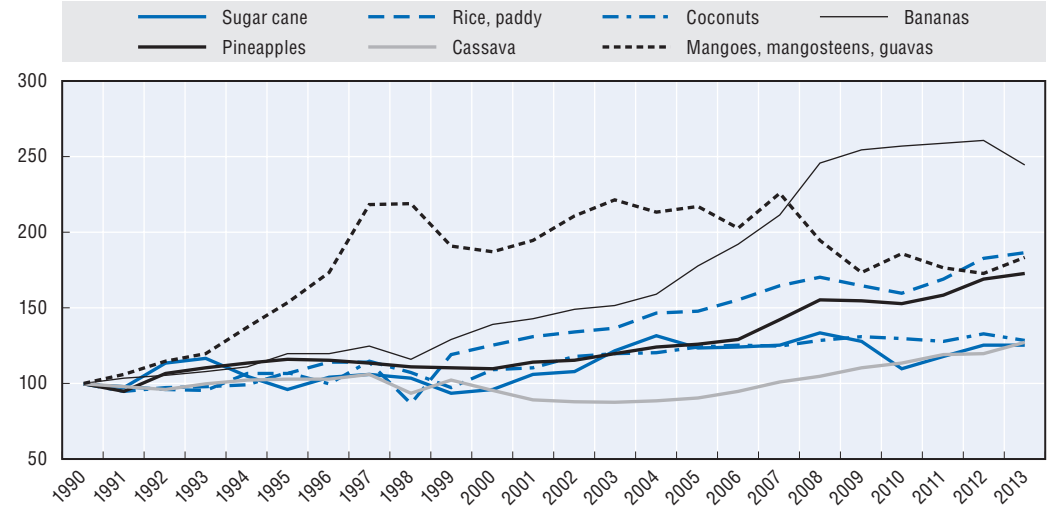
Figure 1.9. **Growth in crop production, 1990-2013**




*Source:* FAOSTAT (2016).

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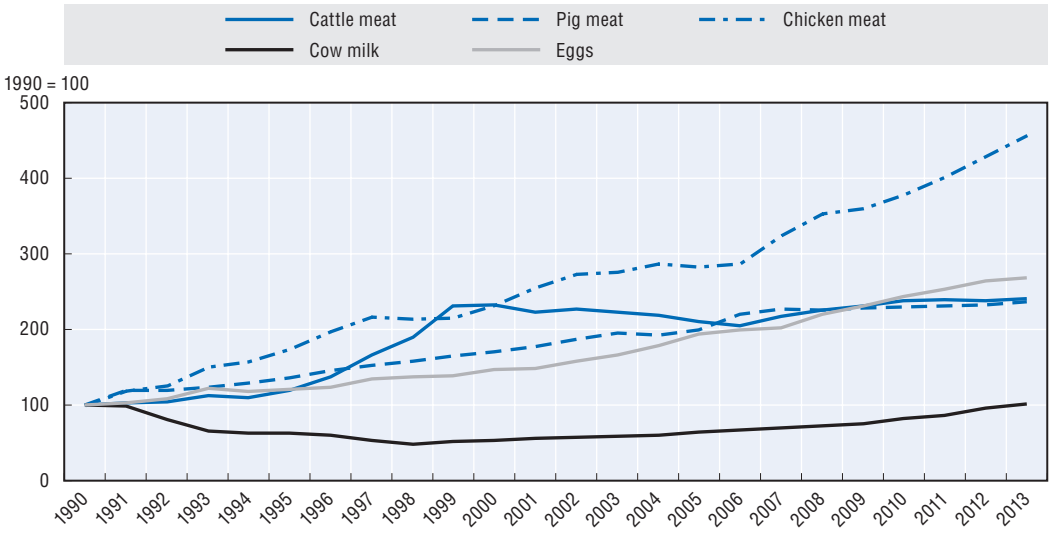
In volume terms, the Philippines ranked first in the world for **coconut** oil production, second for coconut production, third for bananas and fourth for pineapples in 2011-13 (FAOSTAT, 2016). In particular, coconut production and its derived products have been one of the trademarks of Philippine agriculture (Box 1.2). Rice production averaged 17.7 million tonnes in 2011-13, equivalent to 2.4% of global production in this period, making the country the 8th largest rice producer in the world (FAOSTAT, 2016).

Figure 1.10. **Growth in animal production, 1990-2013**




*Notes*: Compared to FAOSTAT data, the Philippine Statistics Authority (PSA) reports higher volumes produced in the early periods covered by this figure, in particular for chicken meat (for 1990-94), cattle meat (for 1990-98) and pigmeat (for 1990). For eggs and for other years, data from both sources are the same or almost the same. Since the increases up to 2013 are calculated using 1990 as the base year, the reported increases based on FAOSTAT data are higher than those based on the PSA data. However, for the sake of consistency with Figure 1.8 and Table 1.2, FAOSTAT data are applied.
*Source:* FAOSTAT (2016).

StatLink http://dx.doi.org/10.1787/888933452110

## Box 1.2. **The development of coconut production**

The coconut industry in the Philippines began as a colonial enterprise under Spanish rule in the 17th century. Small-scale regional trade of coconut products ensued in the 19th century, expanding to Europe by 1898 and later to the United States. The preferential export status granted to the Philippine coconut industry by Europe and the United States encouraged improvement and enlargement up to WWII.

Currently, coconut ranks among the major crops of the Philippines and since the 1960s has been second only to rice in terms of gross value added (Briones and Israel, 2014). Coconut accounts for a quarter of all agricultural land, over a fifth of all agro-food exports, and is produced in 69 of the 81 provinces of the Philippines (FAOSTAT, 2016 and PSA, 2015a). In 2013 the Philippines accounted for 25% of global production of coconuts, second only to Indonesia at 29%, for 24% of global exports of coconuts and for 46% of global export of coconut oil. However, the Philippines' average yield is 4.3 tonnes/ha, much lower than its regional competitors: yields in Indonesia, Thailand and Viet Nam averaged 6.1 tonnes/ha, 4.8 tonnes/ha and 9.6 tonne/ha respectively in 2013 (FAOSTAT, 2016 and UN, 2016).

The Philippine Coconut Authority (PCA) is responsible for the development of the coconut and palm oil industries. The PCA was an attached agency to the Department of Agriculture (DA) from 1987 to May 2014, when authority was transferred to the Office of the President (Chapter 2). The PCA plays a regulatory role, including implementation of quality standards for coconut products. As part of its mandate, any export of coconut products requires export commodity clearance from the PCA, which entails payment of regulatory and laboratory analysis fees.

Every part of the coconut palm can be used to produce hundreds of products for various uses such as food, cosmetics, pharmaceuticals, emulsifiers, propellants, paints, insecticides and fuel. Along with sugarcane, coconut oil is a preferred feedstock for biofuel production, with coconuts used to meet biodiesel mandates and sugar for the mandatory ethanol content. The PCA successfully lobbied for a 5% biodiesel blend that went into effect in 2015. Eleven biodiesel refineries with an aggregate capacity of 585 million litres were operational in 2014, with a marked 48% increase in total capacity registered over 2013-14. Total capacity will need to expand further to meet increased biodiesel blend targets of 10% by 2020 and 20% by 2030 (Corpuz, 2015).

Box 1.2. **The development of coconut production** *(cont.)*

However, a number of factors affect the performance of the coconut industry. Poor management of pests and disease, ageing stocks, low fertiliser application, low technology utilisation, limited access to credit and the high cost of processing contribute to low yields, low product quality and low incomes for producers (Briones and Israel, 2014). The average coconut farm size shrank from 3.6 ha in 1991 to 2.4 ha in 2002, partly due the Comprehensive Agrarian Reform Program (CARP; Section 1.8). The majority of coconut producers are poor: the poverty incidence among coconut farmers was 56% at the beginning of the 2000s, compared to 48% for all agricultural households (Briones and Israel, 2014).

Land under coconut trees is underutilised, with only 30% of land used for intercropping, which could provide alternative income. Fragmented land holdings and small farms combined with poor transport infrastructure increase marketing transaction costs (Briones and Israel, 2014). Slow implementation of CARP has dissuaded investment in tree crops, such as coconuts, that have a long gestation period. Climate change can also disrupt the regularity of production cycles. In 2013, coconut farmers suffered devastating losses in the aftermath of Typhoon Haiyan, which resulted in loss or damage to 33 million trees in Eastern Visayas alone (FAO, 2014b).

The coconut industry has a high potential for growth and can be used as a tool for poverty reduction. Sometimes referred to as the "orphan child" of Philippine agriculture, the industry is a victim of the government's focus on rice self-sufficiency (Lopez, 2015). Coconut replanting, for instance, is much less expensive than the irrigation projects supported for rice production. Investment in diversification of products, replanting, productivity and marketing enhancements, as well as forming co-operatives to take advantage of economies of scale, can add value and increase incomes of farmers.

The industry may also benefit from the Coco Levy Fund, accumulated through a forced stabilisation levy collected from coconut farmers from the 1970s to 1982 during the Marcos administration. Its value is now estimated to reach PHP 71 billion (USD 1.7 billion), held in a trust (Lopez, 2015). In a series of high-profile court cases over the past four decades, coconut farmers have been seeking to recover the levies. If successfully recovered, the levy would be a substantial resource pool to fund development of the Philippine coconut industry and to improve the well-being of Filipino coconut farmers.

Among **animal products**, chicken meat production has been the real contributor to livestock growth, increasing almost five-fold in 1990-2013, followed by egg production, which increased by 169% over the same period. Both chicken meat and egg production have grown from backyard enterprises to commercial operations to satisfy growing domestic demand. Cattle meat and pig meat production have also increased strongly, by 141% and 136%, respectively. Almost all animal production is destined for domestic consumers, with only marginal quantities exported. Production of cow's milk began to grow slowly at the end of the 1990s, but remains very low (Figure 1.10).

## 1.4. Factors of production and productivity

This section assesses the use of key factors of production and compares the evolution in land, labour and total factor productivity in the Philippines with that in selected Asian countries: China, India, Indonesia, Malaysia, Thailand and Viet Nam.

### *Farm input use*

**Mechanisation** differs depending on the crop, operation type and farm size, but the overall level of mechanisation in terms of available mechanical power per unit of land or labour is low, mostly due to the relative abundance of farm labour, its low cost and the predominance of small-scale farming (Amongo et al., 2011).[2] Agriculture is thus largely labour-intensive,

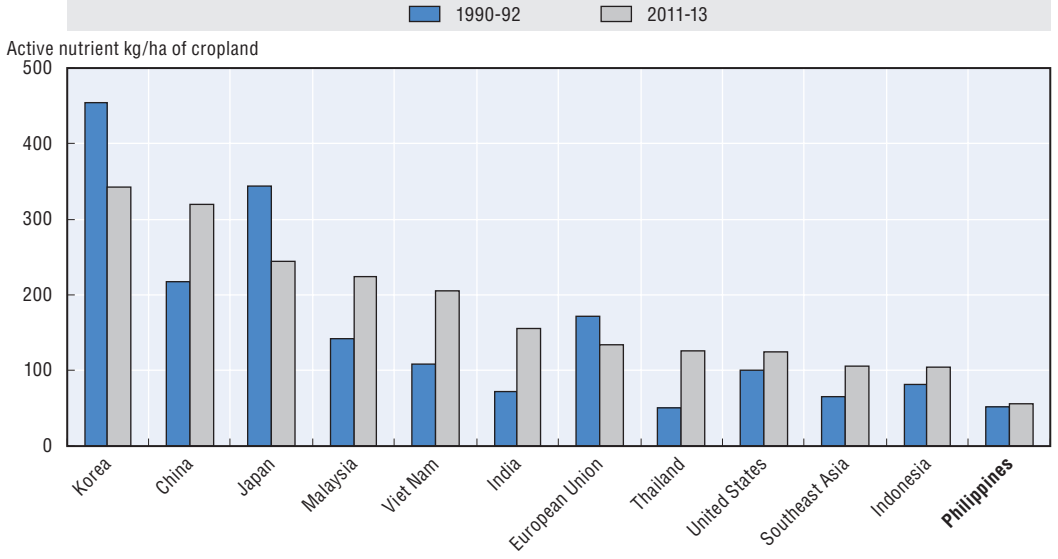
but mechanisation has progressively been introduced for selected operations. For example, while rice planting, transplanting, harvesting and drying are still mostly done manually, mechanical power has been applied for land preparation, threshing, shelling, husking and milling. Also most operations in the large-scale production of sugarcane, pineapple and banana have been mechanised (Amongo et al., 2011). The level of mechanisation in rice and corn farming has increased from 0.52 hp/ha in 1990 to 2.31 hp/ha in 2011 (Caliguiran, 2014).

The Philippines has historically used relatively less **fertiliser** than its Asian neighbours. At 56 kg/ha per year in 2011-13, its fertiliser consumption was the lowest compared to other countries and increased the least over the last two decades, with the exception of Korea and Japan, for which the rates fell from very high levels (Figure 1.11). While an overuse of fertilisers has been a growing issue in China and in some other Asian countries, studies have shown that, on average, Philippine farmers are under-applying fertilisers, thus driving down yields (Briones, 2014).

In volume terms, about a third of fertilisers are used for rice production, followed by maize (21%), fruits and vegetables (19%), sugarcane (7%) and other crops (15%) (Briones, 2014). While in the past fertiliser use was subsidised, the government retreated from subsidies in the early 2010s, with the exception of free distribution of selected inputs for populations affected by calamities (Chapter 2). However, prices paid for fertiliser differ widely across regions, most likely due to differences in distribution and marketing channels (Briones, 2014).

In the 1990s, about half of fertiliser demand was met by domestic production, but in the 2000s this ratio began to reverse in favour of **imported fertilisers**; now demand is predominately met by imports, mostly provided by China (PSA, 2015c). In 2014, total supply of fertilisers was 2.7 million tonnes, of which 2.3 million tonnes was imported and the remaining 0.4 million tonnes supplied by domestic producers (PSA, 2015b).

Figure 1.11. **Use of chemical fertiliser in selected countries, averages for 1990-92 and 2011-13**




*Source:* FAOSTAT (2016).

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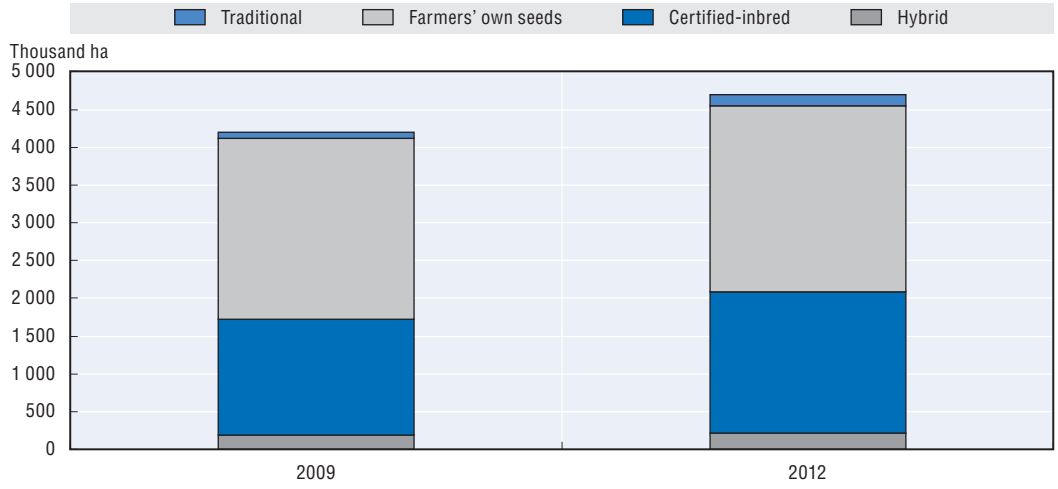
The use of **modern varieties of seeds** varies across crops. Estimates for rice show that the percentage of harvested rice area planted with modern varieties was 97% in 2012. The vast majority of these varieties are inbred lines and just 5% of the total area is occupied by

hybrids. While most farmers are using modern varieties, own-saved seeds accounted for 52% of the harvested rice area in 2012, partly due to the higher cost of purchased seeds and to inefficiencies in infrastructure and distribution systems (Figure 1.12). To improve the adoption of modern rice seeds, in 2002 the government instituted a floor price for high-quality varieties and introduced price subsidies. The programme was discontinued in 2010, but publicly produced varieties, including hybrids, are still sold at costs set by the government and below the private sector competitive price (Sombilla and Quilloy, 2014; Chapter 2).

For vegetables, the share of own-saved seeds is also high, varying from 41% for okra to 95% for snap beans in 2005. Almost all (99%) of marketed vegetable seeds are supplied by private companies. The majority are produced locally either on-station or by contracted farmers, but for some crops a large share of seeds is imported, e.g. for tomatoes (Maghirang, 2010).

Figure 1.12. **Area harvested by type of rice seed applied, 2009-12**




*Source:* Sombilla and Quilloy (2014).

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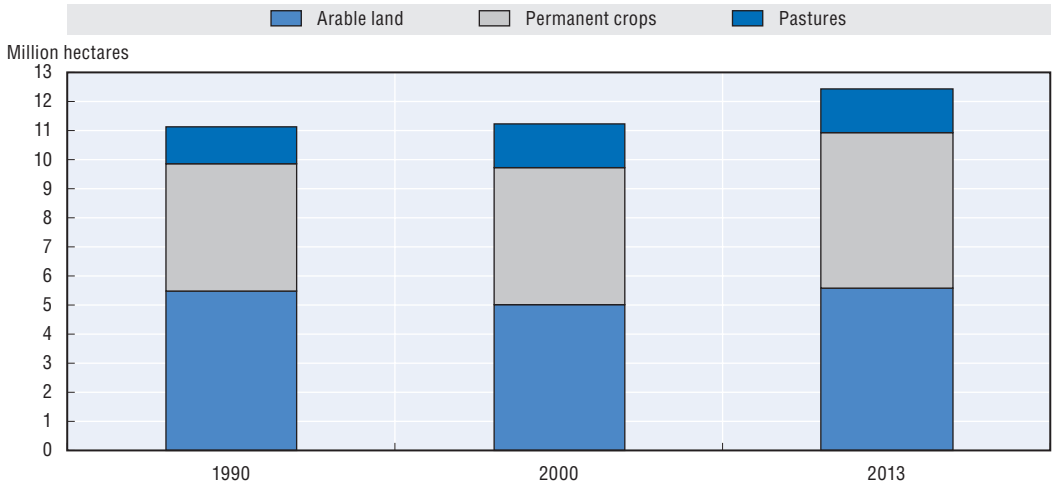
### *Land use and allocation*

At just 0.13 ha per capita, **agricultural land is very scarce** in the Philippines. Mostly due to deforestation, agricultural land has increased by 11% since 1990 and in 2013 it covered 12.4 million ha, representing 42% of overall land area (Figure 1.13). Mindanao accounts for 43% of agricultural land, followed by Luzon at 37% and the Visayas at 20%. While the overall size of arable land is the same as in 1990, land dedicated to perennial crops increased by 1 million ha (23%) and that allocated to permanent pastures and meadows increased by 0.2 million ha (15%) (Figure 1.13).

As agricultural land is scarce and unlikely to expand any further, future growth in crop production will depend entirely on higher yields per ha, including through the development and wider use of high yield seed varieties and promotion of multi-cropping. Moreover, agricultural land is under pressure from urban development. Currently, any **conversion of agricultural land** for non-agricultural purposes has to be approved by the Department of Agrarian Reform (DAR). The National Land Use Act (NLUA) declares all agricultural lands as protected: this is to prevent local governments granting developers the permission to purchase land that is deemed to be of use for agricultural purposes. It was submitted to Congress in 2011 but is still to be passed.

Figure 1.13. **Agricultural land, 1990-2013**




*Source:* FAOSTAT (2016).

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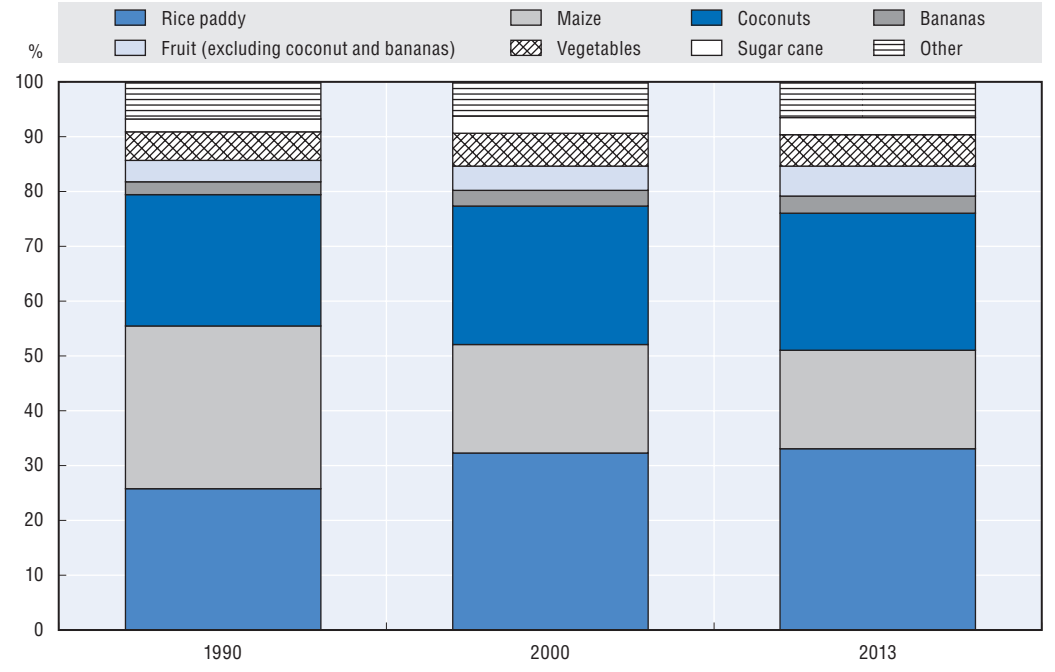
The allocation of **harvested area** by crops shows that cereals dominate, but the relative shares of various cereals are shifting. While the share of rice has increased from one-fourth of the total in 1990 to one-third in 2013, the share of maize fell from almost one-third to less than one-fifth over the same period. This might be an indication of strong support provided to rice production, as discussed in Chapter 2. Coconuts, benefiting from a strong export position, preserved their share at about one-fourth of the total. Sugarcane and bananas account for 3% of harvested area each and the rest is devoted to vegetables, fruit and a range of other crops such as tobacco, abaca, coffee and rubber (Figure 1.14).

Figure 1.14. **Composition of harvested area, 1990-2013**




*Source:* FAOSTAT (2016).

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### *Farm employment*

Agriculture's share in total employment has fallen over the last few decades to 30% in 2014, and most recently the sector seems to have started **shedding labour** in absolute terms. Available data suggest that employment in agriculture (including forestry) trended up to 12.3 million in 2011, but then fell each year to reach 11.2 million in 2014 (PSA, 2015c). If this new phenomenon is confirmed, it might mean that the agricultural sector entering a new stage of development characterised by higher farm labour costs. This would enhance mechanisation, farm labour productivity and incomes.

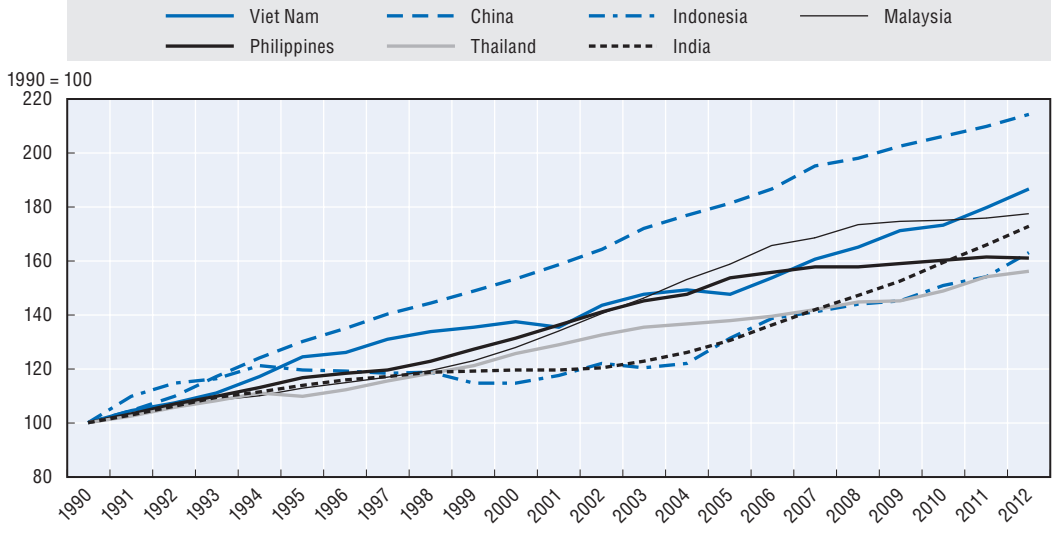
Demographically, active farmers are **ageing**, with the average farmer age at 57 years (Amongo et al., 2011). About 60% of workers employed in the agricultural sector are considered to be engaged in vulnerable employment (own-account workers and unpaid family workers), as opposed to 32% of those in the services sector and 13% of workers in the industrial sector (ILO, 2015).

### *Productivity*

#### *Land*

**Land productivity** in the Philippines increased by 61% in 1990-2012, slightly more than in Thailand (56%), but less than in China (114%), Viet Nam (86%), Malaysia (77%), India (73%) and Indonesia (63%) (Figure 1.15). In terms of the value of agricultural production per unit of land, the Philippines still performs well, at USD 1 529/ha in 2012, better than Indonesia, Thailand and India. However, its relative position has been declining over the last three decades: currently, China (USD 1 863/ha), Malaysia and Viet Nam all outperform it (Fuglie and Rada, 2015).

Figure 1.15. **Growth in land productivity in selected Asian countries, 1990-2012**




*Note:* Land productivity is measured as total agricultural output (constant global-average prices from 2004-06 at constant 2005 USD) divided by the total agricultural land in hectares of "rainfed cropland equivalents".
*Source:* Own tabulation based on Fuglie and Rada (2015), *International Productivity Dataset*, ERS, USDA.

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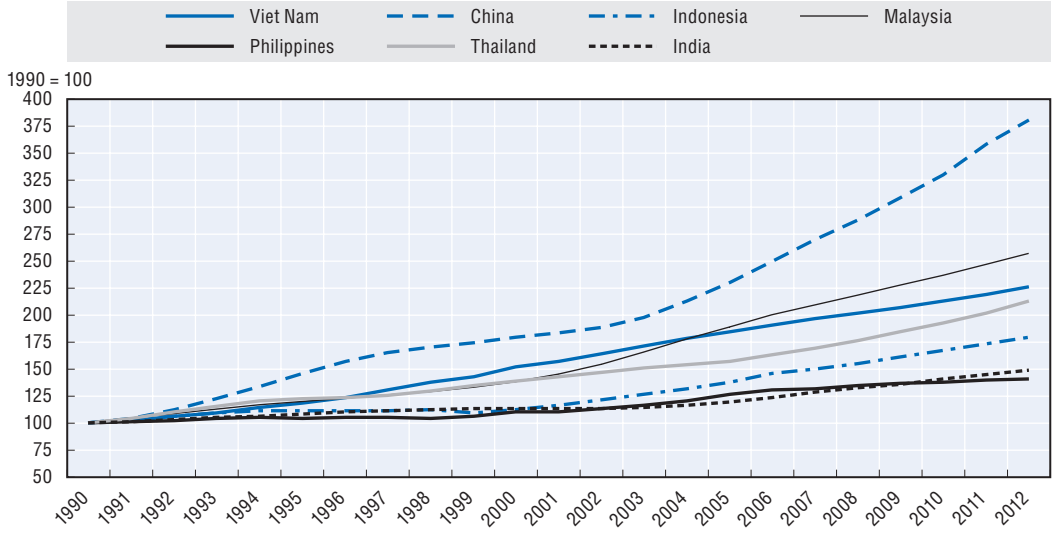
#### *Labour*

**Labour productivity** in agriculture is only one-sixth of that in industry, weighing down the country's overall average (ILO, 2015). Progress made by the Philippines in farm labour productivity is the slowest among major Asian peers (Figure 1.16). In terms of the actual level of productivity per farm worker, the Philippines ranked second just after Malaysia in 1990,

but had been overtaken by China and Thailand by 2012 (Figure 1.17). In 2012, Malaysia's labour productivity was 6.2 times that of the Philippines and China's was 1.4 times higher – an indication of differing levels of infrastructure, technology, mechanisation and investment in workforce skills and training (Figure 1.17). However, as agriculture in the Philippines has started to shed labour in absolute terms, this may accelerate internal restructuring of the farming sector and thus enhance productivity growth, in particular if further supported by policies allowing more flexible reallocation of land resources across farms and crops.

Figure 1.16. **Growth in farm labour productivity in selected Asian countries, 1990-2012**




*Note:* Labour productivity is measured as gross agricultural output (constant global-average prices from 2004-06 at constant 2005 USD) divided by the total number of economically active persons in the sector in a given year.
*Source:* Own tabulation based on Fuglie and Rada (2015), *International Productivity Dataset*, ERS, USDA.

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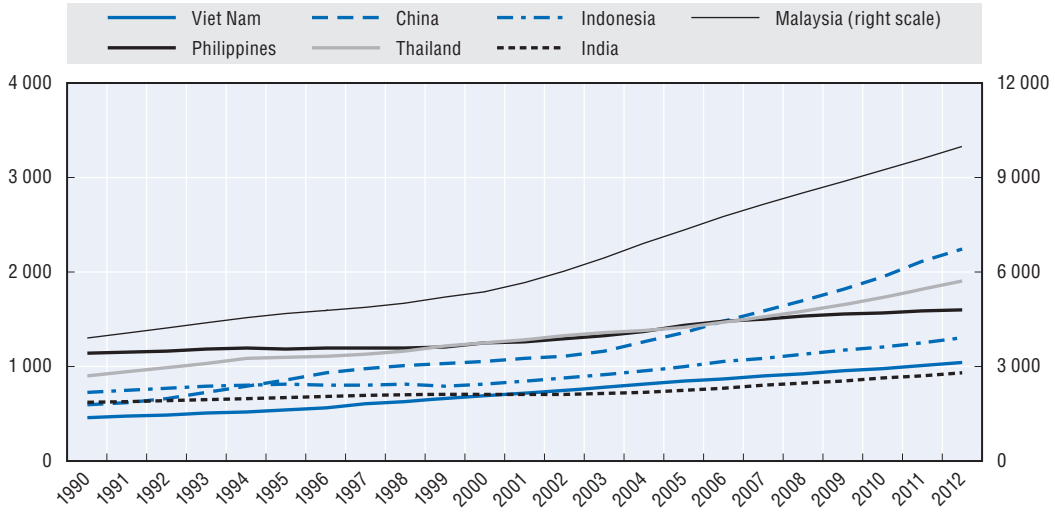
Figure 1.17. **Gross agricultural output per farm worker in selected Asian countries, USD 2005, 1990-2012**




*Note:* Labour productivity is measured as gross agricultural output (constant global-average prices from 2004-06 at constant 2005 USD) divided by the total number of economically active persons in the sector in a given year.
*Source:* Own tabulation based on Fuglie and Rada (2015), *International Productivity Dataset*, ERS, USDA.

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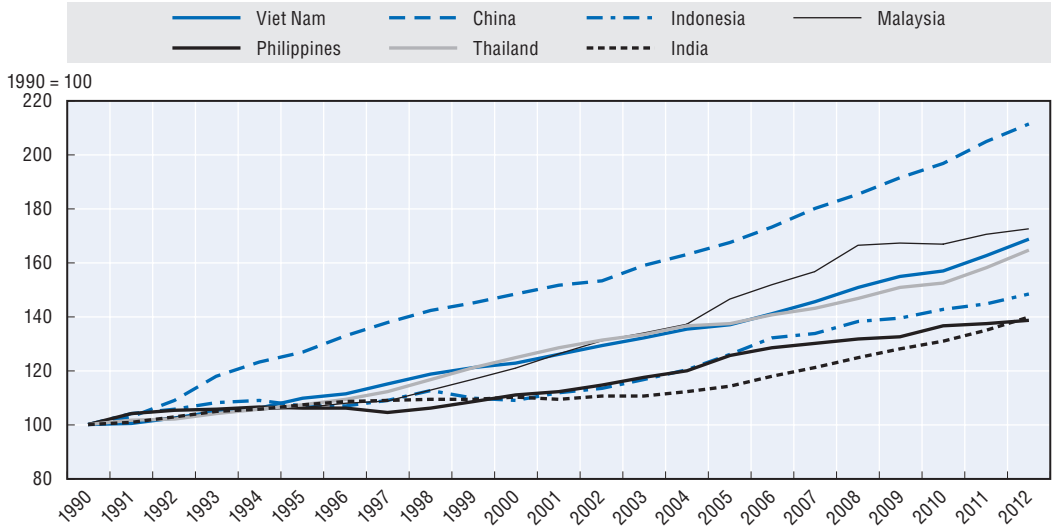
### *Total Factor Productivity*

Reflecting slow progress in land and farm labour productivity, performance in agriculture's **total factor productivity** (TFP) has been weak. TFP increased by 39% in 1990-2012, averaging 1.5% per year (Figure 1.18), placing the Philippines just below India and well behind China, where TFP more than doubled in this period. However, some progress can be noticed in the last decade in the annual rate of growth, calculated as the difference between output and input growth rates. While the rate was particularly slow in the 1980s and the 1990s, at just 0.15% and 0.46% respectively, it accelerated to 1.98% in 2001-12 (Fuglie and Rada, 2015).

Figure 1.18. **Growth in total factor productivity in selected Asian countries, 1990-2012**




*Source:* Own tabulation based on Fuglie and Rada (2015), *International Productivity Dataset*, ERS, USDA.

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## 1.5. Farm incomes, poverty and food consumption

This section examines progress made in terms of farm incomes, poverty alleviation and combatting undernourishment and malnutrition.

### *Farm incomes*

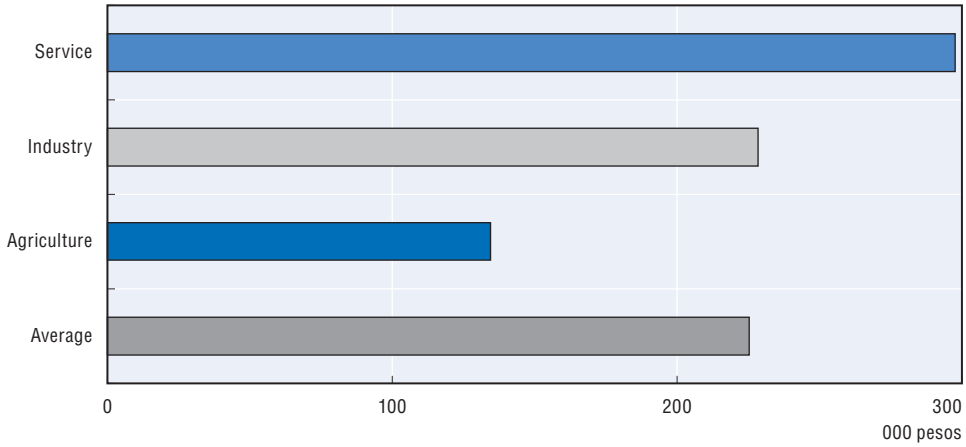
The 2012 Family Income and Expenditure Survey (FIES) showed that 68% of Philippine households derive some income from agriculture. However, only 20% of all households derive more than half of their income from it, and 10% derive more than three-quarters (FIES, 2012).

Despite recent strong economic growth, annual incomes of farm households (including agriculture, forestry and fishing) are still low, at about 60% of the national average and at just 48% of the average income earned by all non-farming households (Figure 1.19).

### *Poverty*

Low farm incomes lead to **high poverty rates** among farmers. According to the national definition of the poverty line[3], the poverty incidence for farm households is high, 38% in 2012, compared to the nationwide average for the urban population of 13% (Figure 1.20). Moreover, farm households are almost five times more likely to be food-poor (subsistence poor) than non-agricultural households. In 2009, of 9.4 million households defined as food-poor, 59% were from agricultural households (Reyes et al., 2012).

Figure 1.19. **Annual income per household by sector of the economy, 2012**




*Source: Family Income and Expenditure Survey* (FIES), (2012).

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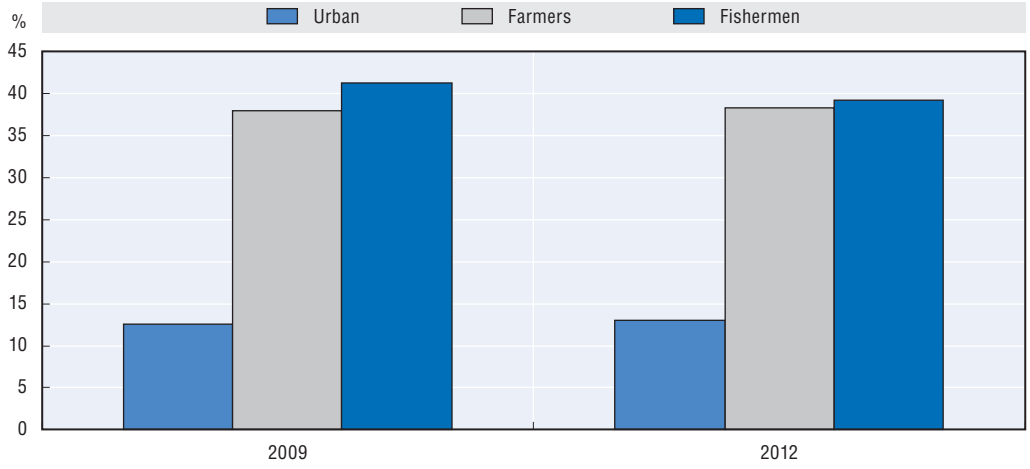
Figure 1.20. **Urban versus farmer and fishermen household poverty incidence, 2009 and 2012**




*Source:* PSA (2014a), *2014 Philippine Statistical Yearbook*.

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Table 1.3 shows that **rural poverty incidence** is much higher than in urban areas across all regions and that, on average, rural poverty rates remain stubbornly high at about 38-40%. There are large differences in rural poverty incidence across regions, varying from above 50% (Bicol, Central Visayas, Zamboanga, Northern Mindanao and Caraga) to 20-25% (Cagayan Valley and Central Luzon). These rates have not changed much over time, with the exception of the Autonomous Region in Muslim Mindanao, where the rate increased from 35% in 2003 to 49% in 2009 (Table 1.3). Moreover, though income inequality has been decreasing in urban areas, the opposite is occurring in rural areas. The Gini coefficient for rural areas increased from 0.39 in 1991 to 0.43 in 2009 (Reyes et al., 2012).

Poverty incidence and **food-poor incidence** varies across agricultural activities (including forestry and fisheries). The highest rate of poverty incidence, at 68% in 2009, is among those working in forestry, followed by corn, coconut, sugarcane, and cacao growers, who all experience a poverty incidence exceeding 50% (Reyes, et al., 2012). Rice producers represent the largest share of total poor and of food poor among those engaged in agricultural

production, even though the poverty incidence for rice growers, at 42% in 2009, and their food poverty incidence, at 20% in 2009, are both below the related averages. By contrast, those engaged in animal farming/raising had both the lowest poverty incidence and the lowest food-poor incidence, at 19% and 9% respectively in 2009 (Reyes et al., 2012).

Table 1.3. **Urban versus rural poverty incidence by region, 2003 and 2009**

| | 2003 | | 2009 | |
|---|---|---|---|---|
| | Urban | Rural | Urban | Rural |
| Philippines | 11.2 | 38.2 | 13.2 | 39.4 |
| NCR-National Capital Region | 3.2 | .. | 4.0 | .. |
| CAR-Cordillera Administrative Region | 3.4 | 31.0 | 4.2 | 34.0 |
| I- Ilocos Region | 19.4 | 25.0 | 19.4 | 25.5 |
| II- Cagayan Valley | 13.3 | 21.4 | 10.6 | 21.9 |
| III-Central Luzon | 9.8 | 16.2 | 11.7 | 21.1 |
| IV-A-Calabarzon | 6.2 | 25.5 | 8.1 | 25.3 |
| IV-B-Mimaropa | 26.3 | 40.8 | 29.5 | 37.4 |
| V-Bicol Region | 25.5 | 53.6 | 29.1 | 51.6 |
| VI-Western Visayas | 13.8 | 37.8 | 15.6 | 38.3 |
| VII-Central Visayas | 19.0 | 53.5 | 19.7 | 51.6 |
| VIII-Eastern Visayas | 22.3 | 41.1 | 29.4 | 44.9 |
| IX-Zamboanga Peninsula | 16.6 | 55.8 | 20.7 | 50.5 |
| X-Northern Mindanao | 22.1 | 49.0 | 23.0 | 51.3 |
| XI-Davao region | 16.7 | 39.7 | 18.1 | 40.5 |
| XII-Soccsksargen | 21.2 | 39.4 | 20.9 | 42.7 |
| XIII-Caraga | 28.1 | 50.9 | 39.5 | 52.0 |
| ARMM-Autonomous Region in Muslim Mindanao | 21.8 | 34.6 | 30.8 | 48.8 |

*Source:* Reyes et al., (2012), "Poverty and Agriculture in the Philippines: Trends in Income Poverty and Distribution"; *Discussion Paper Series* No. 2012-19.

StatLink http://dx.doi.org/10.1787/888933452220

### *Food consumption*

The Southeast Asia region has advanced the most in combatting **undernourishment** in comparison to all other parts of the world, reducing the percentage of those undernourished from 30.6% on average in 1990-92 to less than 10% in 2014-16 (FAO, 2015). The Philippines was one of the 13 countries honoured in 2014 by the FAO for their outstanding progress in reducing hunger and meeting the Millennium Development Goals (MDG) hunger targets, having halved the proportion of undernourished from 26.3% in 1990-92 to 11.5% in 2012-14 (FAO, 2014c); however, the most recent assessment would suggest that the rate increased again to 13.5% in 2014-16 (FAO, 2015). The Philippines has yet to reach the 1996 World Food Summit's (WFS) more ambitious target of halving the absolute number of hungry people by 2015: 13.7 million Filipinos still suffered from undernourishment in 2014-16 compared to 16.7 million in 1990-92, a fall of just 18% (FAO, 2015).

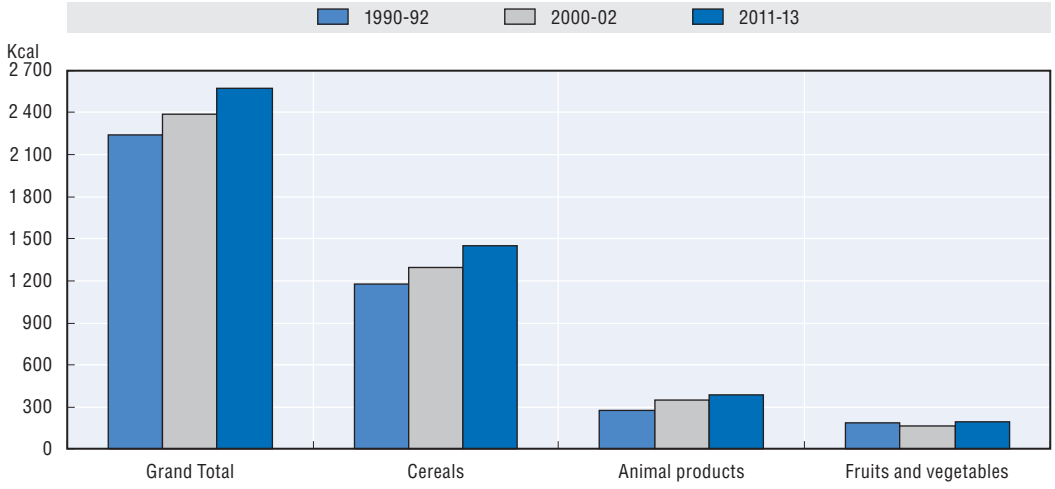
Despite overall progress in combatting undernourishment, the incidence of various forms of **malnutrition** remains very high. In particular, stunting still affects about 30% of children, both among 0-5 year olds and 5-10 year olds. In regions with a dominant share of population in rural areas, such as Bicol or Caraga, stunting affects almost 40% of 0-5 year olds. For the country as a whole, the prevalence of those underweight is also high, at about 20% for 0-5 year olds and almost 30% for 5-10 year olds. The prevalence of underweight children and stunting has marginally declined, but the prevalence of those overweight-for-height is increasing, affecting almost 9% of 5-10 year-old children in 2013 (PSA, 2015a).

Among adults, concomitant problems of both under-nutrition and over-consumption coexist. The proportion of adults with chronic energy deficiency has been declining and was 10% in 2013, but the share of those who are overweight and obese has been rapidly growing and reached almost one-third of population in 2013 (FNRI, 2015).

Daily per capita **energy availability** has increased by 15%, from 2 239 kcal per day in 1990-92 to 2 575 kcal per day in 2011-13. Consumption of animal products is increasing, but that of fruit and vegetables is stagnant and cereals still constitute the bulk of the Filipino diet, consistently accounting for 53-56% of daily intake (Figure 1.21). The dominance of cereals in the diet and very slow diversification of food consumption are further reflections of the policy bias towards rice and corn to attain self-sufficiency in these staples (FNRI, 2015).

Supply Utilisation Accounts (SUA) show that **per capita rice availability**, used as a proxy for food consumption, even increased from 103.2 kg in 2000 to 128.1 kg in 2008, before tapering off to 114-119 kg in 2010-13 (PSA, 2015d). In predominantly rural areas, such as Eastern Visayas and the Cordillera Administrative Region, rice consumption is above 120 kg/capita, compared to predominantly urban areas, such as National Capital Region, where it is below 90 kg/capita. This is due to higher incomes in urban areas, relatively low income elasticity for rice for high-income groups, and stronger diversification of food baskets due to both higher purchasing power and to a wider range of alternative foods in urban markets (CPBRD, 2014).

Figure 1.21. **Daily per capita energy availability, averages for 1990-92, 2000-02, 2011-13**




*Note:* Animal products include fish and fish products.
*Source:* FAOSTAT (2016).

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The share of **expenditures on food** in total household consumption expenditures, known as the Engel coefficient, provides an indication of food security: the lower the share, the greater the food security. Aggregate data show very little change from 43.6% in 2000 to 42.8% in 2012 (PSA, 2015a). In 2008-09, half of the average household's food budget was spent on rice (49.9%) and the rest was spent on pork (16.9%), chicken (11.4%), milkfish (4.6%), bananas (4%), tilapia (3.7%) and other (9.5%). Thus Philippine households, in particular those in low income brackets, are highly vulnerable to changes in rice prices (CPBRD, 2014).

## 1.6. Agro-food trade flows

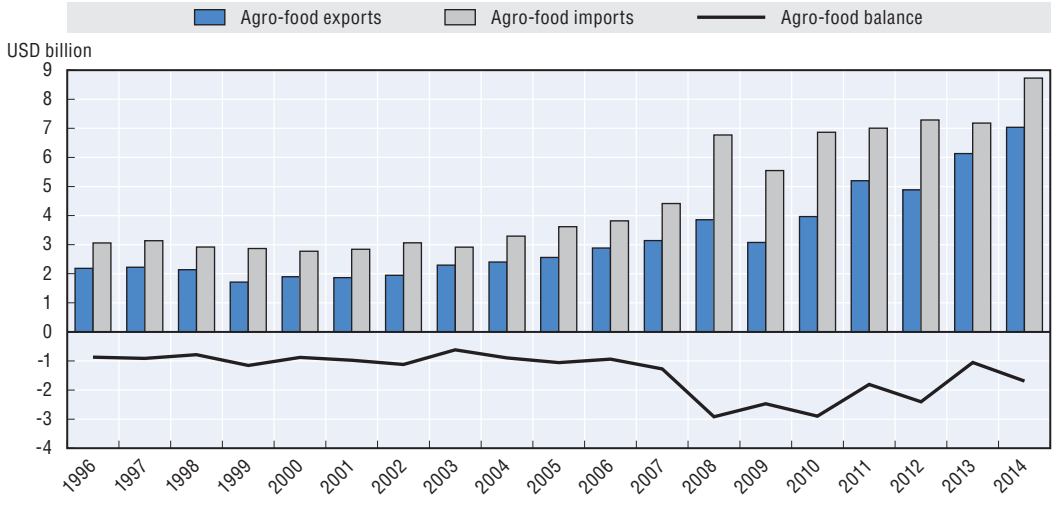
This section evaluates the Philippine agro-food sector's integration with international markets and assesses its export and import performance. Annex 1.A1 provides agro-food trade projections for the Philippines resulting from projected trends in production and consumption of major agricultural commodities by 2025.

### *Integration with agro-food markets*

The Philippines remained a **net importer of agro-food** products during 1996-2014. The total value of agro-food imports increased to almost USD 7 billion in 2008, largely due to skyrocketing agricultural commodity prices, but then stabilised at this level up to 2013 before increasing to almost USD 9 billion in 2014 due to increased volume of imports. Agro-food exports declined in 2009, but since then have more than doubled to about USD 7 billion in 2014, thus diminishing the negative overall balance of trade in agro-food products and increasing the coverage of imports by exports to 80-85% in 2013-14 (Figure 1.22 and Table 1.4). The Philippines currently (2014) has a negative agro-food trade balance with Australia, the United States, ASEAN nations and the European Union, but a positive balance with Japan (PSA, 2015c).

The share of agro-food in total trade has almost doubled since the lows of the mid-2000s, but the agro-food sector remains relatively **weakly integrated with international markets**. In 2012-14, the average ratio of agro-food exports to agricultural GDP was 19%, while that of agro-food imports to agricultural GDP was 25% (Table 1.4). Both ratios are on par with averages for the whole economy, which suggests that this relatively weak openness is not sector-specific, but rather an overall feature of the Philippine economy (Section 1.2 above).

Figure 1.22. **Agro-food trade of the Philippines, 1996-2014**




*Note:* Agro-food trade includes fish and fish products.
*Source:* UN (2016), *UN Comtrade Database*.

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Table 1.4. **Agro-food sector's integration with international markets, 1996-2014**

| | | 1996 | 2000 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Agriculture, Gross Domestic Product (GDP), current prices | USD billion | 17.1 | 11.3 | 13.1 | 15.1 | 18.7 | 23.1 | 22.0 | 24.6 | 28.5 | 29.6 | 30.6 | 32.2 |
| Agro-food exports | USD billion | 2.2 | 1.9 | 2.6 | 2.9 | 3.1 | 3.9 | 3.1 | 4.0 | 5.2 | 4.9 | 6.1 | 7.0 |
| Agro-food imports | USD billion | 3.1 | 2.8 | 3.6 | 3.8 | 4.4 | 6.8 | 5.5 | 6.9 | 7.0 | 7.3 | 7.2 | 8.7 |
| Agro-food trade balance | USD billion | -0.9 | -0.9 | -1.1 | -0.9 | -1.3 | -2.9 | -2.5 | -2.9 | -1.8 | -2.4 | -1.1 | -1.7 |
| Coverage degree of imports by exports | % | 72 | 68 | 71 | 76 | 71 | 57 | 55 | 58 | 74 | 67 | 85 | 81 |
| Share of agro-food trade in total trade | | | | | | | | | | | | | |
| Exports | % | 10.6 | 5.0 | 6.2 | 6.1 | 6.2 | 7.9 | 8.0 | 7.7 | 10.8 | 9.4 | 11.4 | 11.4 |
| Imports | % | 8.8 | 7.5 | 7.3 | 7.1 | 7.6 | 11.2 | 12.1 | 11.7 | 11.0 | 11.1 | 11.0 | 12.9 |
| Ratio of agro-food exports to agricultural GDP | % | 13 | 17 | 20 | 19 | 17 | 17 | 14 | 16 | 18 | 16 | 20 | 22 |
| Ratio of agro-food imports to agricultural GDP | % | 18 | 25 | 28 | 25 | 24 | 29 | 25 | 28 | 25 | 25 | 24 | 27 |
| Ratio of total exports to total GDP | % | 25 | 47 | 40 | 39 | 34 | 28 | 23 | 26 | 21 | 21 | 20 | 22 |
| Ratio of total imports to total GDP | % | 42 | 46 | 48 | 44 | 39 | 35 | 27 | 29 | 28 | 26 | 24 | 24 |

*Note:* Agro-food trade includes fish and fish products.

*Source:* Authors' calculations based on UN (2016), *UN Comtrade Database*; WB (2016), *World Development Indicators*.

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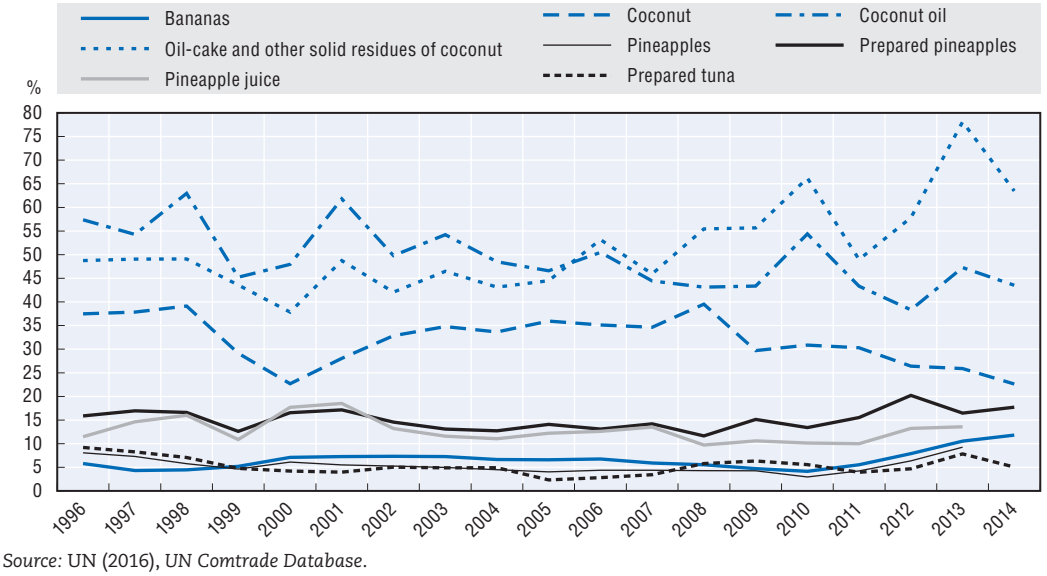
### *Agro-food exports*

Although the overall integration of the Philippine agro-food sector with the world market is weak, the country is a **major exporter of selected products**. For example, the Philippines accounted for 67% of global exports of oil cake from coconuts, 43% of coconut oil, 18% of prepared pineapple, 15% of pineapple juice, 10% of bananas, and 10% of pineapples in 2012-14 (Figure 1.23). Coconut oil is the key agro-food product exported by the Philippines (Figure 1.24). Philippine exports have doubled since the mid-2000s, but global exports have increased even more, largely driven by growing exports from Indonesia. As a result, the Philippines' share of global exports has declined (Figure 1.23).

Figure 1.23. **Share of the Philippines in global exports of selected commodities, 1996-2014**




*Source:* UN (2016), *UN Comtrade Database*.

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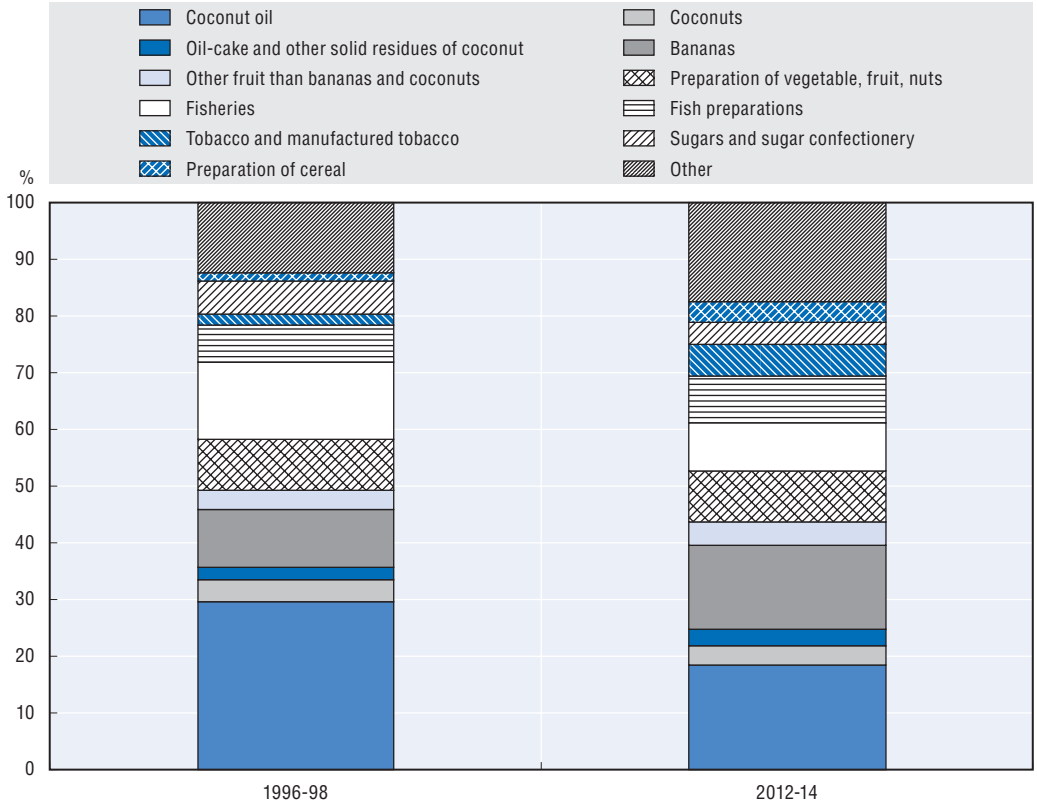
Coconut oil, bananas and fisheries have always featured strongly in the total value of agro-food exports, but their **relative importance** has evolved over time (Figure 1.24). While coconut oil remains the most important product, accounting for 18% of total agro-food exports in 2012-14, its share has declined by one-third since 1996-98. Over the same period, the share of bananas in total agro-food exports increased to about 15%.[4] The share of fisheries and fish preparations declined slightly, but still represents about 17% of the total (Figure 1.24 and Box 1.3). Although tobacco makes up only a small portion of agro-food exports by value, its share has almost tripled since the second half of the 1990s. This change, along with increases in the relative importance of other agro-food products, including fruit other than bananas and coconuts, reflect growing differentiation among agro-food exports (Figure 1.24).

Figure 1.24. **Composition of agro-food exports, averages for 1996-98 and 2012-14**




*Source:* UN (2016), *UN Comtrade Database*.

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The United States and Japan are the **key export destinations** for Philippine agro-food products accounting for 23% and 16%, respectively, of the total agro-food exports in 2012-14 (Figure 1.26). In 2014, 45% of overall coconut oil exports and 39% of pineapples were sent to the United States (PSA, 2015c). Main commodities exported to Japan include sugar, bananas, pineapple products, tuna, and shrimps and prawns. China is the third most important export market, accounting for 7% of the total and an important buyer of bananas, copra oil cake, shrimps and prawns, coconut oil and pineapple products. Korea is a large buyer of copra oil cake, sugar, tropical fruits and seaweed. Overall, exports to the Southeast Asian region mainly consist of tobacco, sugar, copra oil cake and coconut oil. Increases in agro-food exports to Japan, China, Korea and to ASEAN countries in the past few years have been facilitated by bilateral and regional foreign trade and economic co-operation agreements that went into effect in 2005-08 (Chapter 2).

### Box 1.3. **The role of fisheries in the economy of the Philippines**

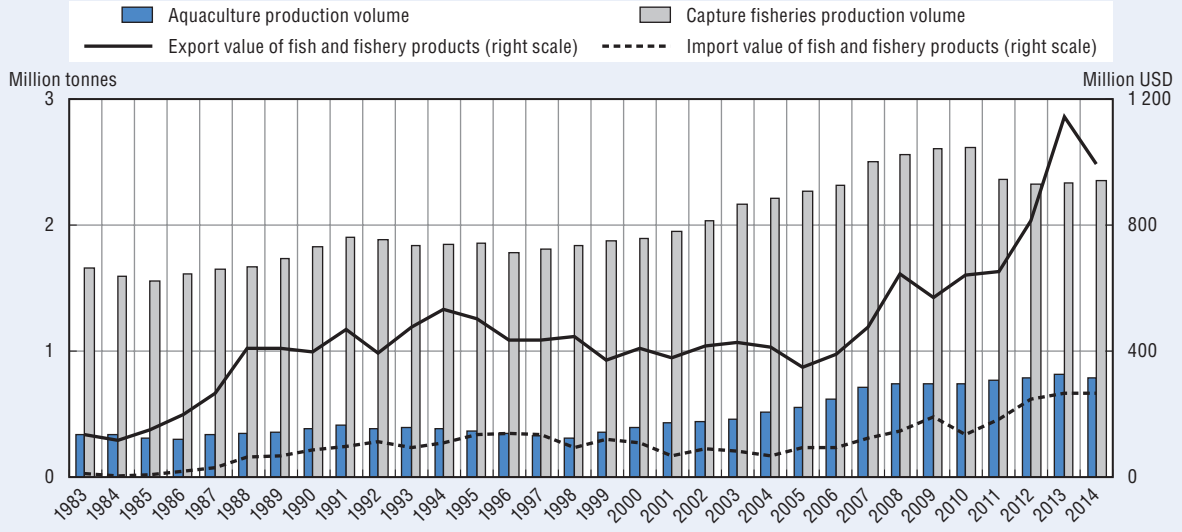
The Philippines is a major fishing nation, with a vast marine water area of 2.2 million km$^2$ (FAO, 2014a). In 2014, the Philippines recorded 3.1 million tonnes of fisheries production, 25% of which came from aquaculture, making it the 12$^{th}$ largest marine fishing nation and 11$^{th}$ largest in aquaculture.

Major species in marine capture fisheries are tuna, followed by sardine, mackerel, and anchovies. Tilapia and carp are the major finfish species in inland fisheries. The Philippines is the world's third largest producer of farmed seaweeds, after China and Indonesia, with a production of 1.8 million tonnes in 2012 (FAO, 2014d).

After a long period of stagnation, the value of Philippine exports of fish and fishery products has been growing rapidly since the mid-2000s (Figure 1.25). In 2013, the total value reached USD 1.1 billion, having tripled since 2005, but then fell by 10% in 2014. Tuna, shrimp and seaweed are the most important export products. Major export destinations are Japan, the United States and China.

Fisheries products are an important source of protein for Filipinos. The consumption of fish is very high, at 32.7 kg per capita in 2011, providing 38.7% of all animal protein consumed. It is estimated that around 1.6 million fishers operate in waters extending up to 15 km offshore, while 16 500 fishermen are involved in commercial fishing operations in waters beyond 15 km. There are also 226 000 farmers engaged in producing fish, molluscs, seaweeds, and other aquaculture products (FAO, 2014a). The fisheries industry accounted for 1.6% of GDP in 2014 (PSA, 2015a).

Figure 1.25. **Fishery production and trade, 1983-2014**




*Source*: FAOSTAT (2016); UN (2016), *UN Comtrade Database*.

StatLink http://dx.doi.org/10.1787/888933452284

Sustainability is one of the most urgent challenges facing fisheries in the Philippines. There are signs of overfishing and a resulting change in the composition of species in the marine ecosystem. In response, Philippine companies have moved to distant-water fishing in the Pacific. Stocks of demersal fish (such as cod, eel, flatfish, pollock and ray) have decreased during the past five decades and the need to improve fisheries management was recognised as early as the 1960s. However, early juveniles of certain fish species are considered a local delicacy, leading to the acceleration of resource depletion. Tropical coral reef diversity is also under threat.

Due to these sustainability concerns, Philippine fisheries exporters sometimes have difficulty accessing international markets such as the EU or the United States which have established criteria for sustainability of imports and for exporter actions to combat illegal, unreported or unregulated (IUU) fishing. The Philippines received a yellow card warning by the EU in June 2014, which could have been transferred into a (red card)

Box 1.3. **The role of fisheries in the economy of the Philippines** *(cont.)*

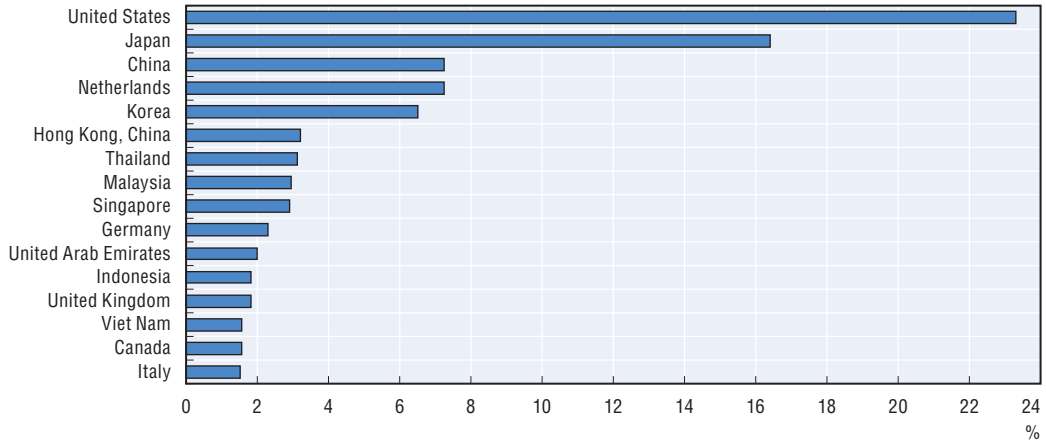
trade ban for insufficient action against IUU fishing. This warning was lifted in April in 2015 after Philippine legal systems were amended and traceability and catch certification schemes were improved.

In aquaculture, challenges include disease control, water quality conservation, quality of feed and seed and environmental impact management. Aquaculture can also be affected by typhoon, landslides, volcanoes, destructive earthquakes and tsunamis.

Partly due to these challenges, projected fish production growth is likely to be slower than consumption growth, thus switching the Philippine net trade position in volume terms to that of a net importer of fish by 2025 (Annex 1.A1).

Figure 1.26. **Main export markets for the Philippines' agro-food products, 2012-14**

As per cent of total agro-food exports




*Source:* UN (2016), *UN Comtrade Database*.

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### *Agro-food imports*

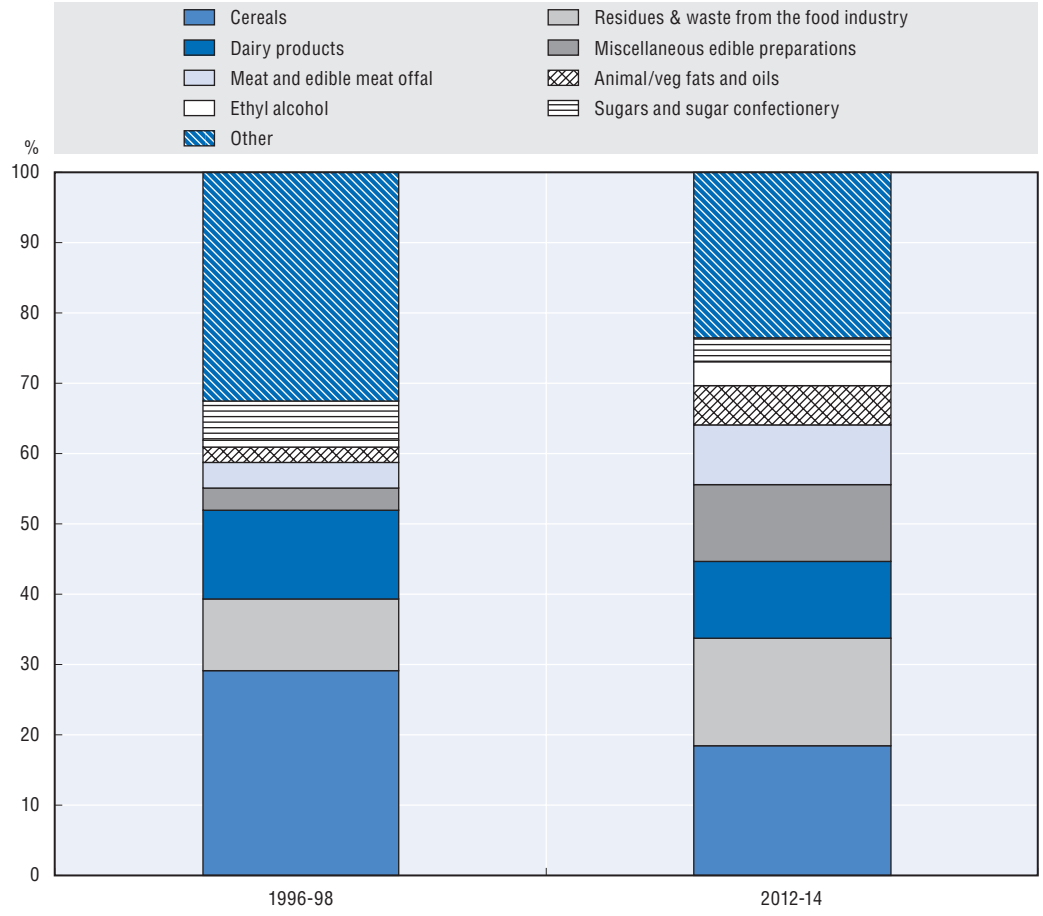
The Philippines' **agro-food imports** consist of two major groups: feed for animal production (in particular oil cake, the key part of the category classified as "residues and waste from the food industry") and products to meet food demand from domestic consumers (wheat, dairy products, beef) and for further processing (Figure 1.27). A large portion of imports goes through the domestic food and beverages processing industry. About 90% of the industry's output is consumed domestically (Singian, 2014).

**Cereal imports** are predominately made up of wheat products, followed by rice, maize and soya beans. They still account for almost one-fifth of total agro-food imports, but their share has declined by about one-third since 1996-98. Imports of wheat and soya beans are increasing and those of rice fluctuate at low levels, being subject to strict domestic and trade policy regulations (Chapter 2).

The Philippines' **dependence on imports** is particularly high for wheat, milk and soya beans. In each case, imports satisfy around 100% of domestic use. Wheat is not produced in the Philippines and production of milk and soya beans is still very small. Large annual variations in the ratio of wheat imports to total domestic use are caused by changes in domestic stocks, but may also be influenced by re-exports in the form of cereal preparations. Import penetration

for beef is also relatively high – about 30% of the market – driven by demand for prime cuts from supermarkets, deluxe hotels and first-class restaurants and for manufacturing grade meat from fast-food chains and processing companies. The shares for rice and maize fluctuate and are relatively small, below 10% for maize and usually 5-20% for rice (Figure 1.28).

Figure 1.27. **Composition of agro-food imports, averages for 1996-98 and 2012-14**




*Source:* UN (2016), *UN Comtrade Database*.

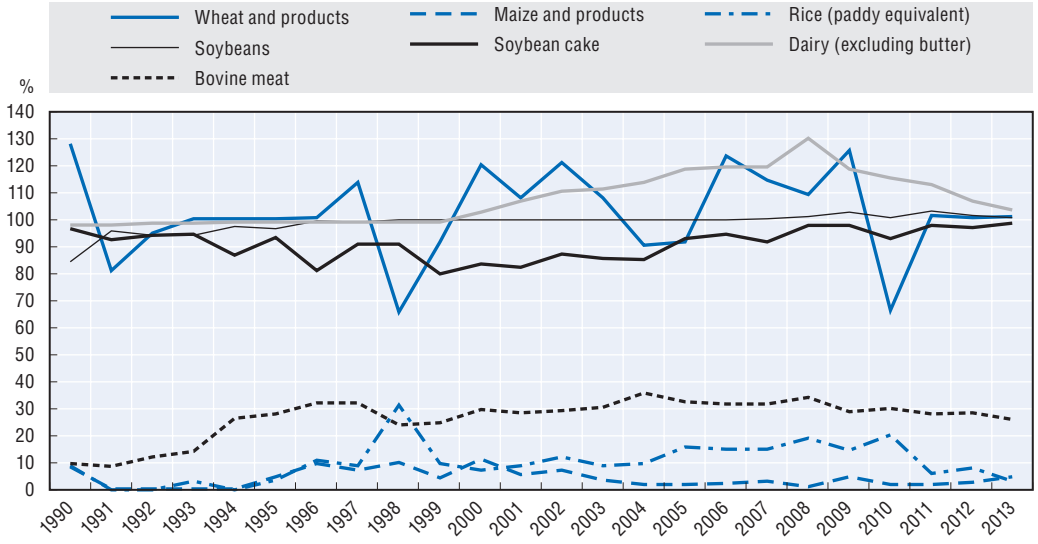
StatLink http://dx.doi.org/10.1787/888933452300

The United States is the **most important supplier** of agro-food products, accounting for almost one-fourth of the total in 2012-14 (Figure 1.29). The Philippines is a top-ten market destination for US agro-food exports, with record sales of USD 2.1 billion in 2014. Imports from the US have nearly tripled since 2005, accounting for 64% of total imports of wheat, 50% of soybean oil/cake meal and 30% of dairy products in 2014, in addition to meat, poultry, maize and other agro-food products (PSA, 2015c). An estimated 65% of agro-food imports from the US flow through the food and beverage processing industry (Singian, 2014).

China, Australia, and a few Southeast Asian nations are other major suppliers (Figure 1.29). China and Australia supply about 6-8% each of agro-food imports, while Malaysia, Thailand, Indonesia and Viet Nam supply 24% of agro-food imports collectively. China is a major supplier of tobacco, but also of agricultural inputs, in particular fertilisers (not included in the total). Australia's main agro-food exports to the Philippines consist of bovine meat, wheat and dairy products. New Zealand supplies 31% of overall dairy imports (2014) and 10% of

bovine meat. Rice is predominately imported from Viet Nam and Thailand. Other notable agro-food products imported from Southeast Asian neighbours include coffee (Indonesia and Viet Nam) and maize (Thailand) (PSA, 2015c).

Figure 1.28. **Share of imports in the Philippines' domestic use of selected commodities, 1990-2013**

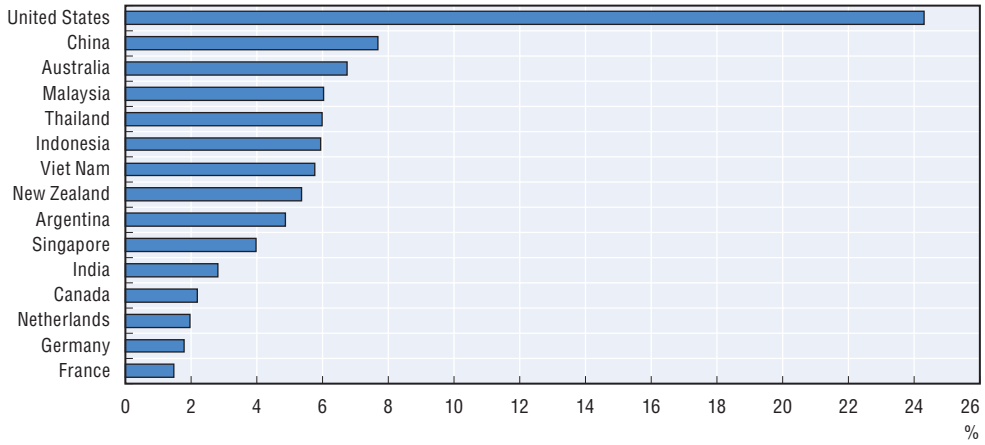



*Source:* FAOSTAT (2016).

StatLink http://dx.doi.org/10.1787/888933452317

Figure 1.29. **Main suppliers of agro-food products to the Philippines, average 2012-14**

As per cent of total agro-food imports




*Source:* UN (2016), *UN Comtrade Database*.

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## 1.7. Agro-environmental situation

Rapid economic growth combined with a burgeoning population is placing massive pressure on the environment. This section provides an overview of key agro-environmental issues, including soil degradation, deforestation, water pollution, carbon emissions from agriculture, threats to biodiversity and implications of climate change.

### *Land and soil*

Soil is important not only for crop yields, but also for its carbon sequestration and water storage capacities. **Soil degradation** is a major problem in the Philippines, mainly due to soil erosion and nutrient depletion. Both have become problematic due to deforestation and unsustainable agricultural practices, including driven by policy measures. The Philippines loses an estimated 457 million metric tonnes of soil per year to erosion (BSWM, 2015).

Soil types in the Philippines can loosely be classified into lowland, upland and hill/mountain soil. **Lowland soil** is located in flat areas between the sea and surrounding uplands, hills and mountains less than 100 metres above sea level. Lowland soils are chiefly fluvial and the most fertile for agriculture. Rivers overflow during the monsoon season and the subsequent flooding regularly replenishes lowland soil with silt (Carating, 2014).

**Conversion** of lowland agricultural land for residential, commercial and industrial activities has become a contentious issue. With 60% of the population living along coastal low-land areas, urbanisation has become a threat to agricultural land. Such land conversion displaces farmers into upland areas, where they engage in practices such as slash-and-burn farming, leading to deforestation and soil degradation (NSCB, 1998 and Suarez and Sajise, 2010).

**Upland soils** are found between 100 to 500 metres above sea level on an 8-18% slope. They mainly consist of alluvial soils formed by runoff siltation of river deltas. They are used to grow upland crops, tree crops and agro-forest trees (Carating, 2014).

**Hill and mountain soils** can be found 300 metres above sea level with a slope of 18% and above. Springs are abundant at these levels, thus areas planted for rice, corn, sugarcane, fruit trees and vegetables can be found, though the soil tends to be acidic and low in fertility (Carating et al., 2014).

### *Forests*

Although 15.8 million ha is defined as **forest land**, only 7.6 million ha is actually forested, accounting for 25% of the country's area.[5] Less than 0.9 million ha is primary forest (Table 1.5). Forest cover is predominately found in Palawan, Mindanao and in the upland highlands of Northern Luzon.

The Philippines has the lowest percentage of forest cover of all Southeast Asian countries, except Singapore (FAOSTAT, 2016). Historical documents show that around 90% of the Philippines was covered in forest when the Spanish first colonised the country in the 16$^{th}$ century. The share had declined to around 50% by 1950. Much of the **deforestation** during the post-war period occurred because of inadequate and corrupt regulation of logging (Suarez and Sajise, 2010). Other reasons include growing population density and expansion of urbanised areas. Uncertain land user rights and land conversion to non-agricultural uses also led to farmer migration and expansion of agricultural land in the space of secondary forests left by loggers. Over 1990-2000, the average annual loss of forest was 89 000 ha (FAO, 2005).

There has been some action to reverse this trend. According to official statistics, **forest disturbance** (due to shifting cultivation, fire, illegal cutting, infestation, typhoon etc.) significantly decreased after 2000, with an average 3 000 ha disturbed per year from 2001 to 2012 (PSA, 2015a). Likewise, the percentage of forest cover has gradually increased from 22% in 1990 to 25% in 2013 (Table 1.5). New policy measures have also been enacted to regrow forestland and to cut the number of timber licence agreements issued and the overall land area available for cutting. In 1990, 75 timber license agreements existed, with access granted

to 2.8 million ha of forest land. By 2014, only two timber license agreements existed, with access to an area of 120 000 ha (PSA, 2015a).

The **National Greening Program** (NGP) of 2011, the Philippines' largest-ever reforestation program, seeks to cover 1.5 million ha with trees over 2011-16. About two-thirds of that goal was met by 2011-14, with 1 million ha of land area reforested (PSA, 2015a).

Table 1.5. **Forest characteristics and dynamics, 1990-2013**

| | 1990 | 2000 | 2005 | 2010 | 2013 |
|---|---|---|---|---|---|
| **Forest characteristics (1 000 ha)** | | | | | |
| Primary forest | 861 | 861 | 861 | 861 | 861 |
| Planted forest | 301 | 323 | 47 | 45 | 765 |
| Other naturally regenerated forest | 5 393 | 5 843 | 6 166 | 5 934 | 5 934 |
| Total forests | 6 555 | 7 027 | 7 074 | 6 840 | 7 560 |
| Total forest cover as % of country area | 22 | 24 | 24 | 23 | 25 |
| **Forest establishment total (1 000 ha/year)** | | | | | |
| Afforestation | n.a. | n.a. | n.a. | n.a. | n.a. |
| Natural expansion of forest | n.a. | n.a. | n.a. | n.a. | n.a. |
| Reforestation | 104 | 34 | 17 | 97 | n.a. |

*Source:* FAO (2015), *Forestry CountrySTAT Database*.

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### *Water*

On average, water is **abundant** in the Philippines. Total actual renewable water resources per inhabitant has been falling, but at 4 800 $m^3$ in 2014 (Table 1.6) was still second highest among all countries in Southeast Asia. The Philippines receives 2 348 mm/year of precipitation on average, with zero dependency on outside sources for freshwater (FAO AQUASTAT, 2011). Despite the country's abundance of water and rainfall, distribution varies widely in time and place. The Department of Environment and Natural Resources (DENR) reported that 19 million Filipinos do not have access to water, due in part to declining health of watersheds caused by deforestation and to poor infrastructure for water storage and distribution (Orejas, 2013).

Agriculture is the main user of freshwater. In 2009, the sector accounted for 82% of total **freshwater withdrawals** (Table 1.6), almost entirely for irrigation and animal production (FAO AQUASTAT, 2011). About 8% of freshwater was used by the industrial sector and around 6% for domestic use (Table 1.6). Of the 81.6 $km^3$ of water withdrawal, 96% was drawn from surface water and the remainder from groundwater (FAO AQUASTAT, 2011).

Of the total estimated **irrigable area** at about 3 million ha, 57% had been developed by December 2015. The regions with the largest irrigated areas are Central Luzon, Cagayan Valley and Ilocos Region, all located on Luzon island (NIA, 2016). Almost 90% of harvested irrigated crop area is used to grow rice, followed by maize (4%), sugarcane (2%) and vegetables (1%) (FAO AQUASTAT, 2011).

**Pollution** of the freshwater supply and lack of wastewater treatment is a major issue, with 31% of all illnesses in the Philippines attributable to polluted water (EMB, 2015). While industry and agriculture contribute to water pollution, the principal source is domestic wastewater/sewage (48%) (NEDA, 2011). Improved sewage treatment and wastewater management could mitigate a good deal of water pollution, but the current infrastructure remains inadequate and resources allocated to improve it are limited (EMB, 2015).

Table 1.6. **Water availability and utilisation, 1992-2014**

| **Freshwater availability - volume per year** | | | | |
|---|---|---|---|---|
| | **1992** | **2002** | **2007** | **2014** |
| Total [km³] | 479 | 479 | 479 | 479 |
| Per capita [1 000 m³] | 7.4 | 5.9 | 5.4 | 4.8 |
| **Freshwater utilisation (volume per year in km³)** | | | | |
| | **1995** | **2000** | **2006** | **2009** |
| Agriculture | na | na | 65.6 | 67.1 |
| Domestic | 4.3 | 5.4 | 5.8 | 6.2 |
| Industrial | 2.3 | 2.9 | 7.5 | 8.3 |
| Total | na | na | 78.9 | 81.6 |

*Source:* FAO AQUASTAT (2016).

StatLink http://dx.doi.org/10.1787/888933452349

### *Air*

**Greenhouse (GHG) emissions** from agricultural production in the Philippines have grown over time, with rice cultivation accounting for about 60% of $CO_2$ emissions from agricultural activities which compares with the 20-22% share of rice in total value of agricultural production. In terms of growth rates, the agricultural activities whose emission impacts are growing the fastest are synthetic fertilisers and crop residues (Table 1.7).

Table 1.7. **Emissions of CO2 equivalent from agricultural activities, gigagrams per year, 1990-2014**

| | 1990 | 2000 | 2010 | 2014 | Change 1990-2014 (%) |
|---|---|---|---|---|---|
| Enteric fermentation | 5 554 | 6 913 | 7 131 | 6 489 | 17 |
| Manure management | 2 427 | 3 151 | 3 685 | 3 323 | 37 |
| Rice cultivation | 23 317 | 28 371 | 30 592 | 33 300 | 43 |
| Synthetic fertilisers | 2 586 | 3 151 | 3 829 | 4 452 | 72 |
| Manure applied to soils | 755 | 978 | 1 140 | 1 073 | 42 |
| Manure left on pasture | 1 906 | 2 416 | 2 416 | 2 257 | 18 |
| Crop residues | 1 151 | 1 301 | 1 576 | 1 833 | 59 |
| Cultivation of organic soils | 0 | 0 | 0 | 0 | |
| Burning - crop residues | 459 | 391 | 402 | 431 | -6 |
| Burning - savanna | 10 | 7 | 13 | 15 | 45 |
| Agriculture total | 38 166 | 46 678 | 50 784 | 53 173 | 39 |

*Source:* FAOSTAT (2016), *Agro-Environmental Indicators: Emissions*.

StatLink http://dx.doi.org/10.1787/888933452357

### *Biodiversity*

The Philippines is one of 18 **megadiverse** countries in the world: a total of 52 177 species of flora and fauna (67% endemic) and 15 000 plant species (40% endemic) have been identified (Altoveros and Borromeo, 2007). New discoveries of species are made yearly. In 2013, 733 species, mostly consisting of flora and birds, were considered threatened or endangered (CBD, 2014). Regarding crops, the Philippines has over 5 500 traditional rice varieties and 90 varieties of bananas, as well as many varieties of fruits and vegetables, both endemic and indigenous (Altoveros and Borromeo, 2007).

There are several **initiatives to protect biodiversity** and plant genome, both in and out of the natural habitat (*in-situ* and *ex-situ* practices). The Philippines has 45 government and non-government organisations that hold *ex situ* germplasm collections (Altoveros and Borromeo, 2007). A National Biodiversity Strategy and Action Plan (2014-25) established a comprehensive plan to protect and conserve Philippine biodiversity. Key biodiversity areas have been identified

and 14.2% (5.45 million ha) of total land is deemed protected area. A legal instrument, the *Writ of Kaliksan* (Rules of Procedure for Environmental Cases, 2010), can be used by the public to put a stop to practices deemed to be environmentally destructive and harmful to biodiversity (CBD, 2014). The major threats to Philippine biodiversity include habitat loss and degradation, over-exploitation and unsustainable use of natural resources, invasive alien species, pollution and climate change (e.g. natural disasters and abiotic stresses) (CBD, 2014).

### *Climate change*

The Global Climate Risk Index (CRI) listed the Philippines, Cambodia and India as the countries most **affected by climate change** in 2013. In its 20-year historical view (1993-2012), the Philippines featured as one of six countries most at risk and affected by climate change: the country registered an annual average death toll of 934 and annual average economic losses of USD 2.8 billion (PPP) (Kreft et al., 2015). Climate change scenarios developed by the Philippine government predict amplified weather events where wet seasons will become wetter and dry seasons will become drier. Projections suggest an increased frequency of heavy rainfall and hot days (>35°C), a rise in sea level, and a rise in temperature (between 0.9-1.1°C) (DA, 2015a).

The rise of sea level threatens mangroves and can affect cultivation areas near river deltas, which are likely to be affected by salt water intrusion. An increase in sea surface temperature affects cyclones and typhoons, which the government predicts will become more frequent and intense (by 10-20%). A combination of biotic and abiotic stress on crops[6], increased by extreme weather events, has already begun and will likely have an increasing effect on crop yields (Chapter 3). A wide range of mitigation and adaptation measures are currently underway. The Adaptation and Mitigation Initiative in Agriculture (AMIA) has adopted seven system-wide programmes to be mainstreamed and implemented throughout the Department of Agriculture's programmes, plans and budget (DA, 2015a and Chapter 3).

## 1.8. Agricultural land tenure and land management system

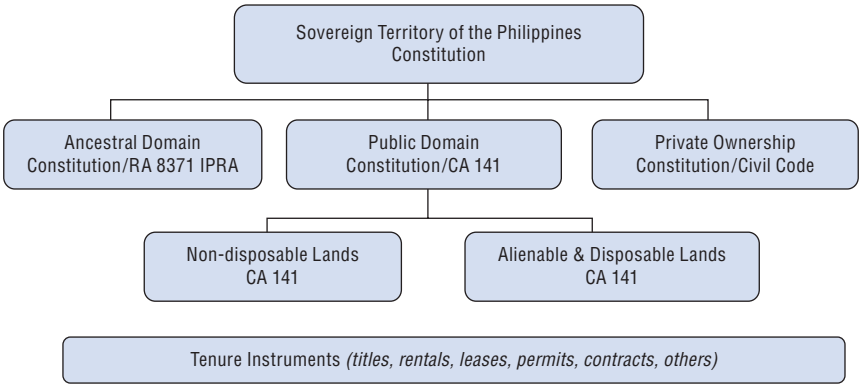
Secure, transferable **rights to land** are an important precondition for a healthy investment environment for agriculture. As stated by the *OECD Investment Policy Reviews: Philippines 2016*: "Reliable land titling and property registrars help individuals and businesses to seek legal redress in case of violation of property rights and offers a form of collateral that investors can use to improve access to credit, which is one of the main obstacles to new investment (…). Investors need to be confident that their land rights are properly recognised and protected and that they are protected against forced evictions without compensation (…). Simple land use rights, such as lease rights, can provide tenure security if they are clear and of specific duration and if the contract cannot be unilaterally broken" (OECD, 2016).

This section provides an overview of basic legal framework shaping land tenure system in the Philippines, assesses the agrarian reform programme and analyses emerging farm structures.

### *Legal framework*

The 1987 Constitution provides a broad framework and principles on the **governance of the territory** of the Philippines. Within this framework, the land tenure system is divided into three basic domains covered by separate laws: ancestral domain (covered by the *Indigenous Peoples Rights Act* – IPRA), public domain (regulated by the *Commonwealth Act* No. 141, known as the *Public Land Act*, PLA) and private ownership (regulated by the *Civil Code*). Public domain land is further divided into "alienable and disposable" (A&D) land (eligible for private ownership) and "non-disposable" land (remaining with the State) (Figure 1.30).

Figure 1.30. **Land tenure system in the Philippines**




*Source:* Quizon and Pagsanghan (2014), adapted from a 2001 DENR Study "Land Laws and Regulations Policy Study: Final Report, Volume 1" under Land Administration and Management Project (LAMP).

Under the 1987 Constitution, all **lands in the public domain** and natural resources belong to and are administered by the State.[7] Agricultural land, being part of land classified as A&D, is considered as suitable for private ownership. Forested land, mineral lands and national parks are reserved for the public domain and can only be leased under certain conditions. The PLA determines how and to what extent agricultural lands in the public domain may be alienated and may pass into private or non-State hands. It governs the survey, classification, lease, sale, or any form of concession, the disposition, and management of A&D lands in the public domain. The Land Management Bureau (LMB) under DENR is the agency responsible for the implementation of the PLA.

Overall, the Philippine system for **governing land tenure**, both in terms of legislation and organisational framework, is very **complex**. Nineteen government agencies are involved in land administration and management (USAID, 2011). In addition to the Constitution, PLA and IPRA, the 1992 Urban Development and Housing Act, the 1989 Organic Act for ARMM (granting self-governance), various land titling and registration laws, and laws under the Civil Code and Family Code complicate land administration and management.[8] The various sector-based land use policies (e.g. related to housing, agriculture and environment) enshrined in separate laws do not address cross-cutting issues for land use (SEPO, 2013). There are overlapping mandates and laws, as well as a functional overlap of agencies (Quizon and Pagsanghan, 2014). These factors create delays, high transaction costs, and problems of fake titles and corruption, thus diminishing investment in land and lowering productivity growth (Pacis, 2008).

### *Agrarian reform programme*

The Philippines inherited a feudal land structure with huge landholdings and a landless rural population of millions from the Spanish colonisation period. The first codified agrarian land reform ideals were embodied in the 1899 constitution, which initiated a "**land-to-the-landless policy**". The same ideal has pervaded all constitutions since, with various agrarian reform measures attempting to referee tenant-landlord relationships and expropriate and equitably distribute agricultural lands. All agrarian reform measures have been rooted in a sense of social justice, but up to the second half of the 1980s their implementation was hampered by political economy and funding constraints.

Central to the Philippine land tenure system for the better part of the last three decades has been the 1988 ***Comprehensive Agrarian Reform Program*** (CARP, RA 6657). The mandate of CARP is much broader than previous agrarian reform policies, which focused on specific crops (e.g. rice and corn) and on establishing a crop-sharing agreement between landowner and tenant. The CARP defines agrarian reform as the "redistribution of lands, regardless of crops or fruits produced, to farmers and regular farmworkers who are landless, irrespective of tenurial arrangement". The programme covers all public and private agricultural land, as well as any other land within the public domain suitable for agricultural purposes. The scope of "CARPable" land evolved over time, but ultimately an estimated 7.9 million ha of agricultural land were marked for redistribution in 2013, i.e. about three-fourths of total agricultural land and more than a quarter of the entire land area of the Philippines. Box 1.4 presents CARP's basic implementation rules.

### Box 1.4. **Comprehensive Agrarian Reform Programme: Key implementation rules**

The Department of Agrarian Reform (DAR) and the Department of Environment and Natural Resources (DENR) are the lead agencies for agrarian reform and responsible for the acquisition and redistribution of all agricultural lands in co-ordination with the Presidential Agrarian Reform Council. While the majority of land to be distributed by DAR is private, DENR is responsible for the distribution of public agricultural and Integrated Social Forestry/Community Based Forest Management lands. The Land Bank of the Philippines (LBP) is responsible for the processing, valuation, and approval of land transfer claims, providing credit assistance to "agrarian reform beneficiaries" (ARBs), and handling compensation for landowners for expropriated land. In the case of "voluntary land transfers" under which landowners and the qualified ARBs agree on the direct transfer of the ownership of land, the LBP is not involved in the compensation process.

CARP sets a ceiling of 3 ha that can be distributed to an agrarian reform beneficiary and 5 ha that can be retained by landowners. Landowners receive a Notice of Coverage informing them that their land is covered by CARP and subject to acquisition and distribution to beneficiaries. In addition to the right to retain 5 ha, landowners are eligible for "just compensation" based on a formula. Payments are subject to a cash limit; any remaining compensation is paid through a range of government financial instruments.

Beneficiaries (ARBs) are ranked by priority: agricultural lessees and share tenants first, followed by permanent farm workers, seasonal farmworkers, other farmworkers, actual tillers or occupants of land, collectives or co-operatives of the aforementioned, and others directly working on the land. Basic criteria for an ARB is that s/he is at least 15 years of age, a resident of the *barangay* (the smallest administrative unit) or at minimum of the municipality in which the land holding to be distributed is located, and that s/he owns no more than 3 ha of land. The beneficiaries have to pay the LBP thirty annual amortisations at 6% interest rate per year for the awarded land. The awarded land can be forfeited and awarded to another qualified beneficiary if the ARB is not able to pay three annual amortisations to the LBP. Beneficiaries also have an obligation to cultivate the land they are allocated and cannot transfer it for a period of ten years, except through hereditary succession, or to the government.

In addition to equitable distribution of land, CARP seeks to empower ARBs to effectively manage and improve agricultural production through government support services. These services are focused on Agrarian Reform Communities where clusters of *barangays* with a high density of ARBs had been identified. These services include land surveys and titling, preferential loans, extension services, marketing and management assistance, support to co-operatives and farmers' organisations, and research and infrastructure facilities.

The Land Registration Authority, an agency of the Department of Justice, issues decrees of registration and certificates of title for land and is the central repository of all land records for registered and titled land. CARP beneficiaries receive Emancipation Patents and Certificates of Land Ownership Awards (CLOAs) free of charge. CLOAs operate under the Torrens system and become full titles upon the completion of amortisation (Quizon and Pagsanghan, 2014).

The schedule of implementation for CARP was initially set for ten years, but the deadline for completion has been extended twice and is up for renewal a third time. Originally scheduled for completion in 1998, Congress initially extended the completion deadline to 2008. In 2009, CARP was again extended under the auspices of ***CARP Extension with Reform*** (CARPER, RA 9700) for five years with completion set for mid-2014 (OG, 2014). CARPER has since lapsed and it is up to the Congress to decide whether or not another extension will be granted and for how long. By December 2015, the government had acquired and distributed almost 7.3 million ha of land, amounting to 92% of the total agricultural land subject to CARP. While DENR had completed its task, DAR still needed to acquire 621 085 ha of land for redistribution, or about 12% of CARPable land under its responsibility (DAR, 2016).[9] About one-third of this balance is a combination of marginal land, exempted land, land already subdivided among heirs and land legally retained by landowners, and thus not in reality available for distribution under CARP, but about two-thirds still does need to be titled and distributed. In the vast majority of regions the accomplishment rate (that is, the share of land eligible for distribution under CARP by DAR that has already been distributed) varies between 90% and 99%, but in three regions the rates were much lower: 66% in Autonomous Region in Muslim Mindanao, 72% in Western Visayas and 77% in Bicol Region (as at the end of 2014) (PSA, 2015a).

While the redistribution of land within CARP/ER can be considered "fairly successful" (Adamopoulos and Restuccia, 2011), the economic and social **effects of the reform are mixed**. Evaluations vary depending on the criteria considered and the assessment method applied, including the selection of households for the sample and those considered as a reference. A comprehensive review by the World Bank concluded that "CARP had a positive impact on poverty and growth. However, the available empirical evidence shows that the impact on poverty has been quite modest" (WB, 2009). This conclusion is largely in line with an earlier evaluation undertaken by the Asia-Pacific Policy Center (APPC, 2007). Some studies suggest that positive changes in the economic characteristics of the respondents were not necessarily attributable to CARP (Gordoncillo, 2012). Independently from the overall assessment of the reform, a number of reviews have found that the various accompanying restrictions on land market transactions and insecure property rights have limited on-farm investment and led to some undesirable economic effects in the agriculture sector:

- Imposing a 5 ha ceiling produced a reduction in average farm size by 7%, a reduction in agricultural labour productivity by 7%, an increase in the share of employment in agriculture by over 3 percentage points, and a reduction in aggregate labour productivity by 5.8% (Adamopoulos and Restuccia, 2011).
- Since formal sale or conveyance of awarded land is prohibited for a period of 10 years and the payment of the amortisation (whichever comes later), banks, other than the LBP, do not accept land certificates (CLOA, Box 1.4) as collateral. This in effect prevents reform beneficiaries from having access to formal lending (APPC, 2007). As a result, rural rental markets operate informally, with extremely high borrowing costs and contract enforcement "by private muscle" (Fabella, 2014).
- Notwithstanding the fact that the vast majority of land has been distributed, property rights of beneficiaries remain uncertain. Although under CARPER individual certificates of land ownership should have been provided within 3 years (i.e., by 2012), in practice by December 2015 almost half (46%) of beneficiaries remained covered only by collective certificates (collective CLOAs), with rights not distributed to individuals (DAR, 2016). This lack of certainty further reduces beneficiaries' access to formal credit and undermines long-term investment.

- CARP permits conversion of awarded agricultural land to non-agricultural uses after 5 years, provided i) the land ceases to be economically sound for agricultural purposes, ii) the beneficiary has fully paid his/her obligations and iii) DAR provides permission. These restrictive rules have encouraged some owners to leave agricultural land idle to show that land is not economically sound and, thus, to accelerate conversion (Fabella, 2014).
- Moreover, policy mandates to produce rice and other subsistence crops, including on lands covered by CARP, limit farmers' incentives to grow higher-value crops (Chapters 2 and 3).

### *Conflict and dispute settlement*

**Conflicts** frequently arise between previous landowners and ARBs, between landowners and leaseholders, and between potential ARBs over competing claims for land. Within CARP/ER, DAR has been granted quasi-judicial power and primary jurisdiction to adjudicate all agrarian reform cases, but problems occur due to overlapping land laws and agency mandates. Other than Judicial courts, the *Joint Administrative Order No.* 1 (2012) seeks to resolve jurisdiction issues on issuance of land titles and conflict of claims among agencies, in relation to the Public Land Act, CARP and IPRA. Additionally, Technical Working Groups and the National Convergence Initiative seek to improve inter-agency synchronisation and the delivery of agrarian justice. However, these efforts have not necessarily led to the co-ordination of policy (Quizon and Pagsanghan, 2014).

Although IPRA is considered to be one of the strongest legal frameworks in terms of recognition of the rights of **indigenous peoples**, its implementation has been "hindered by contradictory legislations, conflicting boundaries and overlapping agency mandates" (Quizon and Pagsanghan, 2014). A key disagreement has been on jurisdiction over forest lands, as the revised Forestry Code of 1975 requires that "all lands above 18 degrees slope automatically belong to the state and are classified as forest lands". Furthermore, many ancestral domains have overlapping limitations with national parks and protected areas, land concessions, and agrarian reform areas covered by land titles and stewardship agreements. Nowadays, mining is the main large-scale incursion into ancestral domain lands. Studies show that about two-thirds of indigenous peoples' lands are affected by mining concessions (Quizon and Pagsanghan, 2014).

Given the limited supply of land and strong population growth, **urbanisation** has resulted in increasing cases of land disputes over conversion of agricultural land for commercial and residential use. A growing issue is the increase in slums, homelessness and informal settlements. In some regions, in particular those affected by disasters, almost one-third of the population consists of informal settlers (Oxfam, 2014). Uncertainties surrounding land use have caused prices for land demarcated for non-agricultural use to spiral upwards.

Various efforts to close the gaps in land tenure governance have been made in the governmental and non-governmental sector. The World Bank initiated the **Land Administration and Management Project** (LAMP) designed to create a sound market and increase land tenure security by developing a consistent set of land administration policies and laws; systematic titling; cadastral index mapping; developing an effective valuation system consistent with internationally accepted standards; and implementing a one-stop-shop for land administration and management with an integrated information system (Pacis, 2008).

A **Cadastral Survey Program** was launched as early as 1913 under Commonwealth Act 2259, but failed to take off due to lack of resources. In 1992, RA 7160 was passed to conduct a cadastral and lot survey, the conduct of which had been under the purview of the DENR but was devolved to local government units (LGUs). By 2012, not a single municipality had carried out the surveys due to financial and human resource constraints. This prompted the DENR to repatriate the delegated functions for executing land surveys from the LGUs (DENR, 2015). The DENR Land Management Bureau (LMB) was made directly responsible and by early 2015 DENR announced that 28.8 million ha had been surveyed, or 87% of total land to be covered (Villanueva, 2015). This should be a significant step toward defining administrative boundaries and making the process of land titling more transparent and efficient.

Three proposed **Congressional Bills** also seek to address inadequacies in land tenure governance: the National Land Use Act (NLUA), the Freedom of Information (FOI) Act, and the Land Administration Reform Act (LARA) (Quizon and Pagsanghan, 2014). Among many other objectives, the new NLUA seeks to harmonise conflicting land laws and to regulate spatial planning, including with a view to disaster preparedness and prevention. The proposed FOI aims to mandate the disclosure of public documents. If approved, it could improve the overall governance of tenure and impact on the delivery of tenure services (Quizon and Pagsanghan, 2014). The proposed LARA attempts to consolidate and streamline within a single government agency land administration powers and functions currently dispersed across various institutions and levels of administration. In July 2016, President Duterte signed the FOI, but as at early December 2016 the two remaining pieces of legislation remained pending due to the highly politicised nature of agrarian reform and land tenure issues.

### *Farm structures*

Partly due to the agrarian reforms discussed above, between 1980 and 2012, the total number of farms increased by almost two-thirds and the **average farm size fell** from 2.8 ha to 1.3 ha. Moreover, while the total number of farms under 1 ha increased more than fourfold, the number of farms greater than 10 ha more than halved (PSA, 2015e and DA, 2015b).

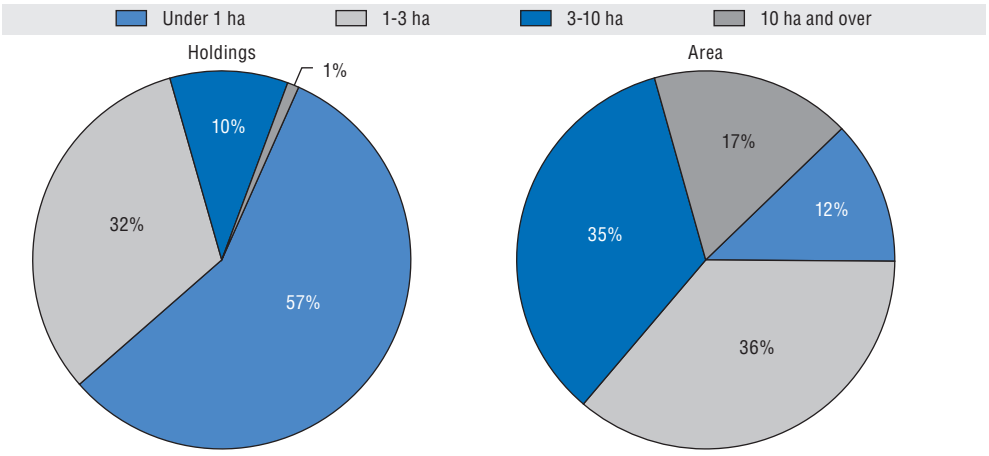
According to the 2012 **Census on Agriculture and Fisheries** (CAF), there were 5.6 million farms, including 3.2 million farms under 1 ha and 55 thousand farms of 10 ha or more. The former accounted for 57% of the total number of farms and 12% of agricultural area, the latter for just 1% of the total number of farms and for 17% of agricultural area (Figure 1.31). Despite the ongoing distribution process, in 2012 there were still 1 600 farms of 50 ha or more, with an average size of 283 ha (PSA, 2015e).

While the legislation supporting agrarian reforms in the Philippines does not allow post-reform consolidation of ownership, the government has devised a national project to encourage **cluster farming** in order to take advantage of economies of scale and create field shapes and sizes conducive to the use of agricultural machinery. Accordingly, the 2013 *Agricultural and Fisheries Mechanization Law* (AFMech, RA 1060) empowers the Department of Agriculture (DA) together with DAR to carry out contiguous farming projects promoting farm land clustering (minimum size of 50 ha), farm development planning, and the promotion or strengthening of farming co-operatives. The 2015 *Sugarcane Industry Development Act* (RA 10659) introduces a "block farm programme" to consolidate small farms to form larger farms with a minimum area of 30 ha to take advantage of economies of scale.

Some development of **on-farm businesses** is taking place. The 2012 Census of Business and Industry indicated that there were 2 641 establishments engaged in agriculture, forestry and fishery activities in the formal sector, up from 1 546 establishments in 2010.

These are relatively large-scale enterprises, using hired labour and around half employing at least 20 workers. Hog farming (16%), sugarcane cultivation (13%) and chicken broiler production (11%) lead this sub-sector by number of farms, but in terms of the value of output, Cavendish banana cultivation is by far the most important (41%), followed by hog farming (14%) (PSA, 2015f).

Figure 1.31. **Distribution of farms and agricultural area, by land size classes, 2012**




*Note:* According to the definition applied by the CAF, a farm/holding is any piece of land used wholly or partly for crop or animal production under single management, and operated as one technical unit by one person alone or with others, regardless of title, legal form, size or location.
*Source:* PSA (2015e), *Special Report – Highlights of the 2012 Census of Agriculture* (2012 CA).
StatLink http://dx.doi.org/10.1787/888933452363

Some ARB farmers are also entering into **Agribusiness Venture Arrangements** (AVA) – contracts with agribusiness firms based most often on land lease and contract growing. Their creation and functioning are strictly regulated. Changes introduced by DAR in June 2016 impose additional regulations to protect ARBs, including automatic and yearly increase of the land lease rates based on core inflation, prohibition of non-payment on the grounds of crop failure due to natural calamities or force majeure and prohibition of unilateral renewals of lease arrangements.[10] While the new regulations attempt to create more equitable relations between ARBs and investors, there is a risk that more restrictive rules will again diminish the incentive for private investors to transact with ARBs, thus denying ARBs access to private sector expertise, marketing channels and to resources that the government is not able to provide.

## 1.9. Competition and structural change beyond the farm gate

This section identifies strengths and weaknesses in the agro-food supply chain and analyses changes in agriculture's upstream and downstream sectors.

### *Supply chain connectivity*

Agro-food supply chains in the Philippines are disrupted by **infrastructure gaps**, which remain widespread, in particular in road and rail connectivity, and logistics and energy (OECD, 2016). As major agricultural production areas are spread across the archipelago, their connection with food consumption centres is crucial for the creation of coherent domestic market.

Government **expenditure on physical infrastructure** in the Philippines has long been low. In 2008-12 it ranged between 1.4% and 2.1% of GDP, below that in most other ASEAN countries (Navarro and Llanto, 2014). To improve the situation, the *Philippine Development Plan 2011-16* (PDP) set out strategies and major programmes to be supported by increased public spending on infrastructure (NEDA, 2011). Consequently, spending rose to 2.7% of GDP in 2013 and 3.2% in 2014, with 5% budgeted for 2015 (Singson, 2014).

In addition to increased public spending and improvements in the regulatory environment, the government is pursuing **public-private partnerships** (PPP) to fund infrastructure and value-chain development. Although these changes will encourage private participation in infrastructure, gaps persist in terms of policy implementation, infrastructure regulation and the attraction of effective investment to key sectors (OECD, 2016).

Gaps in infrastructure are particularly **disruptive for agro-food supply chains** dealing with perishable products and connecting predominantly small-scale producers with consumers. These gaps drive up transaction costs and result in higher prices for inputs and higher wholesale and retail prices for food. Limited connectivity increases post-harvest losses, lowers farmers' income and decreases farmers' incentive to produce.

According to PDP, the ineffective **logistic services** associated with inappropriate postharvest handling lead to significant post-harvest losses: around 15% for rice, 7% for corn, 16-40% for vegetables and 5-48% for fruits. Logistics account for 30-40% of total marketing costs and distribution and processing costs are 20-30% higher in the Philippines than in developed countries (NEDA, 2011).

Inadequate and poor quality **farm to market roads** (FMR) remains an important issue. While the length of FMR roads has been increasing, the majority are still gravel or red dirt roads, susceptible to damage from flooding and extreme weather events, and often impassable during the wet season (ADB, 2012). The DA in partnership with the Department of Public Works and Highways and LGUs is aiming address this issue through growing expenditure on FMRs and concrete, rather than "all-weather" gravel roads (DA, 2015c).

The importance of **paved roads** on agricultural labour productivity has been demonstrated by numerous studies. For example, Llanto has shown that a one percentage point increase in the length of paved roads as a ratio to total length of roads is associated with an increase in agricultural labour productivity of PHP 285 000 (USD 5 700) per worker. This contrasts with results for irrigation expansion, which has shown a positive but insignificant relationship with agricultural labour productivity (Llanto, 2013).

In addition, **inter-island shipping costs** are high due to existing physical constraints in port infrastructure, but also to cabotage restrictions which allow just a few domestic firms to control most of the primary shipping routes. This contributes to large-scale inefficiencies and higher prices for many goods, in particular food (WB, 2013b). The recent amendment to the Cabotage Law adopted in July 2015 has partly removed these restrictions and allowed more efficient foreign ships to service domestic routes. This move is expected to lead to greater efficiency, lower operating costs and lower freight rates (OECD, 2016).

### *Input supplies*

The *Philippines Development Plan 2011-2016* identified the **high cost of production inputs** as a key constraint to agriculture (NEDA, 2011). Increased expenditure on R&D and rural infrastructure are stipulated in the 1997 *Agriculture and Fisheries Modernization Act* (AFMA,

RA 8435) with the aim of making the agriculture sector more profitable and better prepared for global competition. The Act established the Agro-Industry Modernization Credit and Financing Program (AMCFP), mandated with the packaging and delivery of various credit assistance programmes aimed at, among other things, easing farmers' access to inputs: fertilisers, seeds, farm machinery, work animals, water pumps, feeds etc. Exemptions on tariffs and duties for the importation of agricultural and fisheries inputs (e.g. farm equipment, machinery, fertiliser, seeds, renewable energy systems etc.) were renewed in 2003 until 2015. Further laws that impact agricultural mechanisation and capital inputs are the *Agricultural Engineering Law* (1998) and the 2013 AFMech (see above).

### *Fertilisers*

Prior to 1986, the Fertilizer and Pesticide Authority practiced a price-setting policy and quantitative restrictions were placed on imports. In the second half of the 1980s these practices were abandoned and fertiliser policy became more market-oriented. Currently, tariff rates range from 1% to 3% depending on the product, but AFMA (1997) provides for **duty-free importation** of fertilisers and pesticides (Briones, 2014). Liberalisation of the sector has opened the door for numerous private sector players to take over the distribution of fertilisers; it has also allowed competition from imports, reducing prices.

Though domestic demand is now predominately met by **imports from China** and other trading partners (Section 1.4), some domestic manufacturers managed to weather the increased competition following liberalisation. Presently, there are five fertiliser producers in the Philippines, with a combined capacity of 2.47 million metric tonnes per year (Briones, 2014). PHILPHOS, formally a Government-Owned and Controlled Corporation (GOCC), was privatised in 2000 and is by far the largest producer, accounting for 47% of production capacity (Briones, 2014).

Importers/manufacturers, distributors/wholesalers and dealers/retailers are the major players in the industry. Some larger plantations and farmer co-operatives have the capacity to import fertilisers directly, but most pass through **distributors** who sell fertilisers to dealers who then resell to end users. In some cases distributors can also sell directly to end users if they have a dealer's licence. Entry into fertiliser marketing is relatively simple, which contributes to healthy competition. In 2012 there were 483 licensed handlers (Briones, 2014).

The large number of participants in the market has deterred distributors and dealers from increasing the mark-up for fear of losing buyers, thus the **mark-up** along the supply chain has been minimal (Briones, 2014). Based on anecdotal evidence, importers normally sell fertilisers to distributors, dealers or end users at a 3% mark-up which, due to competition, seldom deviates (Briones, 2014).

A high correlation between world and domestic prices indicates that the Philippine **fertiliser market** is well integrated with the world market. However, price disparities exist across regions. They can be explained by deficiencies in transport infrastructure, high logistics cost and differences in distances to shipping ports. The cheapest fertilisers can be found in Illocos, Cagayan Valley, Western Visayas and in Davao, while the most expensive are in ARMM and Eastern Visayas (Briones, 2014). Despite some inefficiency along the supply chain, in general, farmers have access to fertilisers at competitive prices.

### *Seeds*

Both the public and private sector play a role in the **seed industry**. The public sector develops improved varieties and regulates quality control while the private sector produces and distributes seeds to farmers (Norton and Francisco, 2006). The Bureau of Plant Industry (BPI) of the DA is the main governing arm for the country's seed system. Under the BPI, there is the National Seed Industry Council (NSIC), which, among other responsibilities, prioritises plant breeding activities and promotes the establishment of infrastructure for further development of the seed industry (Sombilla and Quilloy, 2014).

The **Seed Industry Development Act** of 1992 aimed at strengthening the local seed industry. It restricted the importation of commercial quantities of seeds that were grown locally, unless not enough local seeds could be produced to meet domestic demand; this provision was repealed by the Agricultural Tariffication Act of 1995. Currently, Administrative Order (AO) No. 4 (2009) permits seeds that have passed the national co-operative trial and that are approved by the NSIC to be imported on a commercial scale (Sombilla and Quilloy, 2014).

A number of agencies are involved in the **research and development** (R&D) of plant breeding and seed production, including the International Rice Research Institute (IRRI) (rice), the Institute of Plant Breeding of the University of the Philippines Los Baños (corn, legumes, root crops, vegetables, and fruit crops) and the Philippine Rice Research Institute (PhilRice) (rice). In order for a new variety of seed to be recognised, it must undergo multi-location yield testing, a process that typically takes several years. New varieties are certified by the National Seed Quality Control and Services (NSQSC), also under the BPI. Once a new variety is approved, it goes through the process of multiplication. In the case of rice, the process takes one to two years (Norton and Francisco, 2006).

The government strongly promotes the adoption of **hybrid seeds**. Prior to 2010, seed subsidies, cash incentives, discounts, guaranteed prices and plant-now-pay-later schemes were the norm (Chapter 2). Seed subsidies were removed in 2011, but the government mandated a fixed price for publicly bred seeds, below the private sector competitive price; this measure discourages seed growers from selling their seeds through formal channels (Sombilla and Quilloy, 2014).

Though most farmers use modern seed varieties developed in the last two decades, a large percentage use **own-saved seeds** (Section 1.4). The reasons vary across crops, but insufficient availability of commercial seeds, inadequate seed distribution systems, long distances to seed suppliers, and high hybrid seed prices relative to farm gate prices are among the most often cited (Sombilla and Quilloy, 2014).

### *Machinery*

Small-scale farming and on-going farm fragmentation (Section 1.8) are **not conducive to mechanisation**. Other constraints include very limited access to formal credit and inadequate extension services poorly transmitting information on technological innovations (Amongo et al., 2011). However, a fall in the total number of employed in agriculture (Section 1.4) combined with higher farm labour cost will enhance a wider use of various types of machinery.

The *Agricultural and Fisheries Mechanization Law* (AFMech) enacted in 2013 seeks to create synergies between Philippine government agencies, the R&D arms of academic institutions, farmer organisations and private entities to sustainably promote the

development and adoption of agricultural machinery and technologies. Key aspects of the **legislation** are to build linkages between stakeholders, increase R&D, provide training and extension services to farmers, create policy supporting mechanisation, establish custom hiring services for machinery and encourage machinery pooling. The Philippine Center for Postharvest Development and Mechanization (PhilMech) is mandated to take the lead role in implementing different governmental programmes and plans for mechanising the agricultural sector (Amongo et al., 2011).

Both AFMech and the mandate given to the PhilMech to integrate mechanisation efforts are steps into the right direction, but co-ordination remains an issue, including in agricultural mechanisation R&D activities. There are various government and private institutions conducting separate R&D activities, which leads to duplication and waste of resources (Amongo et al., 2011).

### *Marketing channels for selected commodities*

#### *Rice*

In the Philippines, much of the rice output is consumed where it is produced (Sombilla et al., 2006). However, there are major net **surplus regions** such as northern and central parts of Luzon (Illocos, Cagayan Valley and Central Luzon) and major **net deficit regions**, in particular the southern part of Luzon (NCR and Calabarzon) and Central Visayas (DA, 2015b). Demand in net deficit regions is met by supplies from surplus regions and, partly, by imports.

The marketing system for rice has been shaped by government intervention policies and by the involvement of government agencies in the commodity flow from producers to consumers. The government intervenes by controlling imports and exports of rice, buying from producers, stocking, selling to wholesalers and providing price support to growers (Chapter 2; WTO, 2012). The **National Food Authority** (NFA) plays a central role in these activities. It buys rice from growers at a support price set by the Inter Agency Committee on Rice and then sells to dealers at fixed prices. These government interventions are aimed at enhancing the income of small farmers through a price floor policy while protecting consumers through a paddy price ceiling (Chapter 2).

Despite government involvement in the **rice market**, considerable competition exists for the available surplus of paddy. Typically, farmers sell paddy to local assembly traders or collectors. The latter gather surplus rice and arrange for it to be delivered to mills or traders (Alavi, 2012). Rice millers are present in all major production areas (Sombilla et al., 2006). The industry is fragmented with around 8 250 millers operating in the country in 2015 (NFA, 2016). Equipment used is typically antiquated and quality issues are prevalent. The moisture of rice is determined by the eye and rarely by moisture metres because of their high cost. As a result, laboratory analysis has shown that 80% of retail rice fails to comply with grading standards (Alavi, 2012).

Wholesalers and wholesale-retailers are most often found in regions with rice surpluses. Retailers are concentrated in rice-deficit areas, primarily in the NCR and Calabarzon. Some market concentration can be found at each stage of the marketing channel. At the retail level, supermarkets and the modern retailing sector account for a growing share of rice sales (Alavi, 2012).

The **poor state of infrastructure** makes shipments of rice from other countries and from surplus regions difficult and costly. Typically, roads pass through urban areas rather than around them, making the use of large, cost-efficient trucks impractical (Alavi, 2012). Marketing costs are also high, partly due to disjointed agents. A recent World Bank study reveals that it takes about 18 marketing agents (e.g. assemblers, traders and millers) to process 90 000 tonnes of dry rice a year, while in Thailand the same can be done by just one miller (WB, 2015).

Within the Philippines, the **government's market interventions** have been criticised on the grounds of allocative inefficiency, poor targeting, and high public budgetary cost (Mariano and Giesecke, 2014). As discussed in Chapter 2, the NFA's price stabilisation efforts have led to high domestic prices for consumers, well above that on international markets. This runs counter to the government's poverty reduction aims, as food cost accounts for a large portion of household expenditures (WB, 2015).

While high import tariffs and price support protect rice growers and insulate them from price shocks, this kind of protection is high-cost and does not incentivise farmers to produce higher-value crops or to migrate to higher productivity non-agricultural sectors (Chapters 2 and 3 and WB, 2015). Moreover, high domestic rice prices compared to those on international markets, combined with strict regulations applied on formal rice imports, encourage rice smuggling. Media reports suggest numerous such cases, but the actual scale is difficult to assess.

### *Sugar*

The Philippines is the **8th largest sugarcane producer** in the world, but is not a major player on the international sugar market due to high production costs (Corpuz, 2014). The island of Negros in the Visayas accounts for 57% of total Philippine sugar production, followed by Mindanao with 19% and Luzon with 14%. About 90% of the total originates from four sugar-planter federations and three miller associations. There are 27 sugar mills (running at about 60% capacity) and 13 sugar refiners (running at 73% capacity) (Ang, 2015).

According to the Sugar Regulatory Administration (SRA), there are about 65 000 sugarcane farmers in the country. About 80% have farms of less than five hectares (due to the CARP) and less than one per cent have farms greater than 100 ha. Farms of more than 100 ha are much more productive with an average of 7.34 tonnes/ha compared to those of less than 5 ha with an average of 5.03 tonnes/ha (Ang, 2015).

The sugar industry is the second most **highly protected sector** in the Philippines after rice, with domestic sugar prices well in excess of those on international markets (Chapter 2). The SRA manages sugar production and supply through a system established in 1952 under the *Sugar Sharing Act* (RA809, 1952). Under this system, the sugarcane producer allocates 30% of cane harvest to the mill in payment for the processing of the cane. As soon as the sugar is processed, the mill issues a warehouse receipt, *quedan*, to the farmer, equivalent to his/her 70% share of the sugar, which the farmer then immediately sells to local traders, who in turn sell them to larger traders. The latter sell the *quedans* in large volumes to wholesalers, distributors, or processors who withdraw sugar from the mills (Ang, 2015). The *quedan* system is argued to discourage millers from upgrading their operations, as 70% of the returns for any investment will go to farmers rather than to them (Cahiles-Magkilat, 2013).

The SRA determines the proportion of sugar designated for export, domestic use and reserve and approves releases from warehouses or customs (Chapter 2). Traders registered with the SRA can import and export sugar, but exports are only authorised by

the SRA once domestic demand has been met (WTO, 2012). The SRA has also the power to grant conversion rights to producers across various designations, depending on the market situation.

Under the ASEAN Free Trade Agreement (AFTA) the Philippines agreed to lower the common preferential tariff on sugar from 38% in 2010 to 10% in 2014 and to 5% in 2015 (Chapter 2). To make the sugar industry competitive under the **lower tariff regime**, the *Sugarcane Industry Roadmap (2011-2016)* promotes block-farming, an increase in bioethanol distilleries (supplying the 10% bioethanol mandate), selling electricity from power co-generation of processing sugar, constructing roads between mills and farms, and pursuing production of bioplastics, biowater, biofertilisers and other by-products of sugarcane.

### *Coconuts*

Philippine **production of coconuts** is year-round. Postharvest, farmers typically extract coconut meat for drying into copra and sell mature or husked coconuts to village agents who then sell to traders. No written contract is required (Briones and Israel, 2014). Any volume, size or quality is accepted and farmers are paid immediately in cash. Though hundreds of products can be made from coconuts, copra is the chief traded product. Traders sell copra or husked coconuts to mills for processing, which is predominantly done in coconut-growing areas. There are 63 coconut oil mills, 38 oil refineries, 10 desiccated coconut plants, 10 oleo chemical plants, 8 activated charcoal plants, 9 shell charcoal plants, and 12 biodiesel plants throughout the country (Briones and Israel, 2013). Most copra is processed into crude coconut oil, which is exported or used domestically. It can be further refined for edible cooking oil or into oleochemicals for biodiesel or other manufactured goods.

The arrangement between farmers, village agents and traders allows farmers to avoid the transaction costs of transporting their goods to local markets or larger cities, but it also means that traders control farm gate prices. This allows traders and millers to benefit from **high marketing margins**. Coconut farmers could benefit from economies of scale by forming co-operatives, an initiative recognised by the Philippine Coconut Authority (PCA). In 2014, the PCA signed a memorandum of agreement with the Cooperative Development Authority (CDA) to strengthen the development of coconut farmer co-operatives (PCA, 2014).

### *Supermarkets*

The food retail sector is growing and spreading across the country, with rising per capita incomes motivating **supermarket growth** (WB, 2008). Modern retail outlets have been built in both urban and rural areas. These are dominated by national chains as laws restrict retail FDI in the Philippines, despite partial liberalisation in 2000 which allowed entry of foreign investment in selected areas of retail trade (Reardon et al., 2012 and OECD, 2016).

Around 70% of retail food sales can still be attributed to **wet markets and "mom & pop" shops** (*sari-sari* stores), but the market share of hypermarkets, supermarkets and convenience stores is increasing (Claridades, 2014). Consumers are attracted to their cleanliness, longer operating hours, and the variety of both perishable and non-perishable goods offered. That said, wet markets are still more popular for fresh products. *Sari-sari* stores remain the primary source of food sales due to proximity and payment flexibility, including short-term credit extended to regular customers. Overall, *sari-sari* stores serve lower and middle-income consumers, while supermarkets serve middle to high-income consumers (Claridades, 2014).

Typically, **large-scale retail stores** have many suppliers, which include local food processing enterprises or their distributors, trading firms or importers/distributors. While a few large retailers have the capacity to import directly, the most common and preferred practice is to source products from importers/distributors. Despite increased importation of food items by supermarkets, domestically produced items account for 80% of the total food supply (Claridades, 2014).

### *Agricultural trading enterprises*

The NFA is identified as the only **state-trading enterprise** in the Philippines (WTO, 2012). It essentially has a monopoly on rice imports. While, since July 2001, private sector imports have been permitted, they have to be organised through tenders to NFA and are subject to quantity limits set by the government. Moreover, dominant government-to-government agreements on rice trade as well as preferential treatment accorded to the NFA (e.g. waived import duties) essentially push out the private sector from trade transactions in rice (Alavi, 2012; Chapter 2).

## 1.10. Summary

At just 0.13 ha per capita, **agricultural land is very scarce** in the Philippines. Water is relatively abundant but shortages – even drought – can occur during the dry season, which can be further exacerbated by climatic events in some regions.

The s**ound macroeconomic environment** and institutional reforms undertaken in the 2010s improved the competitiveness of the Philippine economy, thus improving the enabling environment for agriculture. The Philippines ranks in the middle of 32 emerging countries covered by the Agricultural Growth Enhancing Index, performing relatively well on governance, driven largely by good macroeconomic performance, but below average on capital and agriculture/sustainability. Areas of particular concern are poor infrastructure, a poorly functioning labour market, low capital input per unit of farm labour and low land availability.

The role of agriculture in GDP-creation halved from 22% in 1990 to 11% in 2014 and its share in employment fell by one-third from 45% to 30% over the same period. While this **structural shift** out of low-productivity agriculture to higher-productivity sectors is important, it is less prominent compared with most other countries in the region, in particular China and Viet Nam.

**Agricultural productivity** growth remains a challenge and lags behind other Southeast Asian countries as a result of decades of underinvestment, policy distortions, uncertainties linked with the implementation of agrarian reform and periodic extreme weather conditions. In contrast to its Asian peers, the Philippines is not making the shift from low value agricultural commodities to products that can attract higher returns, occupy less land area and improve farmer incomes. This is largely due to a set of distortive policies privileging low value commodities, in particular rice. Alone amongst Asian countries, the share of rice in the total value of agricultural production in the Philippines actually increased from 16% in 1991 to 22% in 2013.

Agriculture seems to have started **shedding labour** in absolute terms. This could indicate that the sector is entering a new stage of development characterised by higher farm labour costs. If so, this will accelerate internal restructuring of the farming sector and enhance mechanisation, leading to higher productivity and higher incomes, in particular if supported by policies allowing more flexible reallocation of land resources across farms and crops.

**Annual incomes** of farm households are low, at about 60% of the national average and just 48% of the average income earned by all non-farming households. Low farm incomes have led to high poverty rates among farmers: 38% in 2012, compared to the 13% nationwide average for urban populations. The Philippines almost halved the proportion of undernourished from 26% in 1990-92 to 13.5% in 2014-16. However, the incidence of various forms of malnutrition remains high; in particular, stunting still affects about 30% of children.

The Philippines is a **net importer of agro-food products**. Its agro-food sector remains relatively weakly integrated with international markets, as indicated by low ratios of agro-food exports and imports to agricultural GDP. This weak openness is not sector-specific, but rather an overall feature of the Philippine economy.

Philippine **land tenure governance** is very complex, both in terms of legislation and organisational framework. Nineteen government agencies are involved in land administration and management. While the redistribution of land within the Comprehensive Agrarian Reform Program can be considered "fairly successful", economic and social effects of the reform are mixed. Various restrictions on land market transactions and insecure property rights limit on-farm investment and have led to a range of undesirable economic effects in the agriculture sector. Largely due to agrarian reforms and to demographic pressures, between 1980 and 2012, the total number of farms increased by almost two-thirds and the average farm size fell from 2.8 ha to 1.3 ha.

**Gaps in infrastructure** and logistics disrupt agro-food supply chains dealing with perishable products and connecting dominantly small-scale producers with consumers. These gaps drive up transaction costs and result in higher prices for inputs and higher wholesale and retail prices for food. Limited connectivity increases post-harvest losses, lowers farmers' income and decreases farmers' incentive to produce.

High **cost of production inputs** is considered as one of key constraints to agriculture. Though most farmers use modern seed varieties developed in the last two decades, a large percentage use own-saved seeds mostly due to insufficient availability of commercial seeds, inadequate seed distribution systems, long distances to seed suppliers and high hybrid seed prices relative to farm gate prices. Despite some inefficiency along the supply chain of fertilisers, in general, farmers have access to fertilisers at competitive prices. However, price disparities exist across regions. They can be explained by deficiencies in transport infrastructure, high logistics cost and differences in distances to shipping ports. Small-scale farming and on-going farm fragmentation are not conducive to mechanisation. Other constraints include very limited access to formal credit and inadequate extension services poorly transmitting information on technological innovations.

### *Notes*

1. By comparison, the share of rice in Viet Nam's value of agricultural production increased from 40% in 1991 to 46% in 2000, but fell to 35% in 2012, with the share of more lucrative products such as coffee increasing six-fold, rubber four-fold, and pepper three-fold over 1991-2012 (OECD, 2015b). Even in Indonesia, with its strong focus on self-sufficiency in rice production, the share of rice in the value of agricultural production declined from 32% in 1991 to 19% in 2009, as the country increased the production of palm oil, cassava, cocoa beans, and poultry meat (OECD, 2012).
2. Lack of water control and efficient irrigation and drainage systems at the field level, combined with inadequate roads for delivery of farm equipment, also curtail mechanisation (Amongo and Larona, 2014).
3. In the Philippines, the poverty line (threshold) is defined as the minimum income/expenditure required for a family/individual to meet the basic food and non-food requirements. Basic food requirements are based on 100% adequacy for the Recommended Energy and Nutrient Intake (RENI) for protein and energy equivalent to an average of 2 000 kilocalories per capita, and 80% adequacy for other nutrients. Those below this threshold are defined as food-poor. Basic non-food requirements,

indirectly estimated by obtaining the ratio of food to total basic expenditures from a reference group of families, cover expenditure on: clothing and footwear; housing; fuel, light, water; maintenance and minor repairs; rental of occupied dwelling units; medical care; education; and transportation and communication. Thresholds are revised every three years and differ across regions.

4. The strong performance of the banana industry was facilitated by President Arroyo's Executive Order No. 807 issued in 2009 allowing expansion of the area dedicated to banana plantations. This voided the long-standing Letter of Instruction No. 58 issued in 1973 by former President Ferdinand Marcos which had set the allowable area for commercial banana plantation at 21 000 ha, later (in 1979) expanded to 26 750 ha.
5. Although the Philippines applies the FAO's definition of "forest", there is a discrepancy between national and FAO data on total forest cover. The FAO quotes 7.6 million ha and the Philippines' Forestry Management Bureau quotes 6.8 million ha. This report uses the FAO data.
6. Biotic stress is caused by other living organisms, such as bacteria, viruses, fungi, parasites, beneficial and harmful insects, weeds, and cultivated or native plants. Abiotic stress is due to a negative impact of non-living factors such as strong winds, extreme temperature, drought, flood, salinity.
7. State ownership of land is analogous to the Regalian Doctrine employed by the Spanish Crown during colonisation to claim exclusive power over all land. Under the Doctrine, the crown maintained sovereignty and private ownership of land could only be granted by royal decree – parallel the State's power today.
8. A recent study prepared on behalf of the Asian NGO Coalition for Agrarian Reform and Rural Development recognises that, unlike some other Asian countries that have a comprehensive and consolidated Land Law or a Land Code, land tenure in the Philippines is based on numerous pieces of legislation reflecting sectoral approaches to land and resource policy, tenure reforms and administration. Moreover, while new laws or amendments are constantly being passed by Congress, the old laws are often not repealed. Various sections of old laws are simply superseded, replaced or amended, thus old laws retain their residual validity in totality or in part (Quizon and Pagsanghan, 2014).
9. Regardless of whether or not CARPER is extended, DAR is mandated to continue distribution of land to beneficiaries until completion, as long as a Notice of Coverage informing a landowner that his/her land is covered by CARPER was issued before or on 30 June 2014, per RA No. 9700 (CARPER) (OG, 2014).
10. DAR Administrative Order No. 04-16, Subject: "Rules on Agri-Business Venture Agreements", 7 June 2016.

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# ANNEX 1.A1

# *The Philippines: projected production, consumption and trade for major commodities by 2025*

This annex presents the main projections for the major agricultural commodities produced, consumed and traded by the Philippines during the next ten years as embedded in the OECD-FAO *Agricultural Outlook 2016-2025* report. The main purpose of the report is to build consensus on global prospects for the period 2016-25, for the agriculture, fisheries and food sectors, and on emerging issues affecting these sectors. A jointly developed modelling system, based on the OECD's Aglink and FAO's Cosimo models, facilitates consistency and analysis of the projections. Box 1.A1.1 provides a short description of the methodology. The fully documented outlook database, including historical data and projections, is available through the OECD-FAO joint Internet site *www.agri-outlook.org*.

### *The Philippines: The main macroeconomic and policy assumptions underlying the baseline projections*

The *Outlook* is presented as a baseline scenario considered plausible given a range of conditioning assumptions. These assumptions reflect a specific macroeconomic and demographic environment which shapes the evolution of demand and supply for agricultural and fish products. These general factors for the Philippines are as follows:

- Population is assumed to increase from 101 million in 2015 to 116 million in 2025.
- Inflation is expected to average around 4% in the next ten years.
- The Philippine Peso is expected to appreciate in nominal terms relative to USD from PHP/USD 45.2 in 2015 to PHP/USD 40.8 in 2025.
- GDP is expected to grow at 6.8% per year.
- The policy framework, including the level of tariffs, is assumed to remain as defined within the Philippines' WTO commitments until 2025.

### *Main findings*

#### *Position of the Philippines on selected world markets*

The Philippines is not a major player on global agro-food markets for key agricultural commodities and its position is expected to remain low over the coming decade. Rice represents the most important product in the Philippines, projected to account for 2.4% of the world production in 2025 at 14 million tonnes (Figure 1.A1.1).

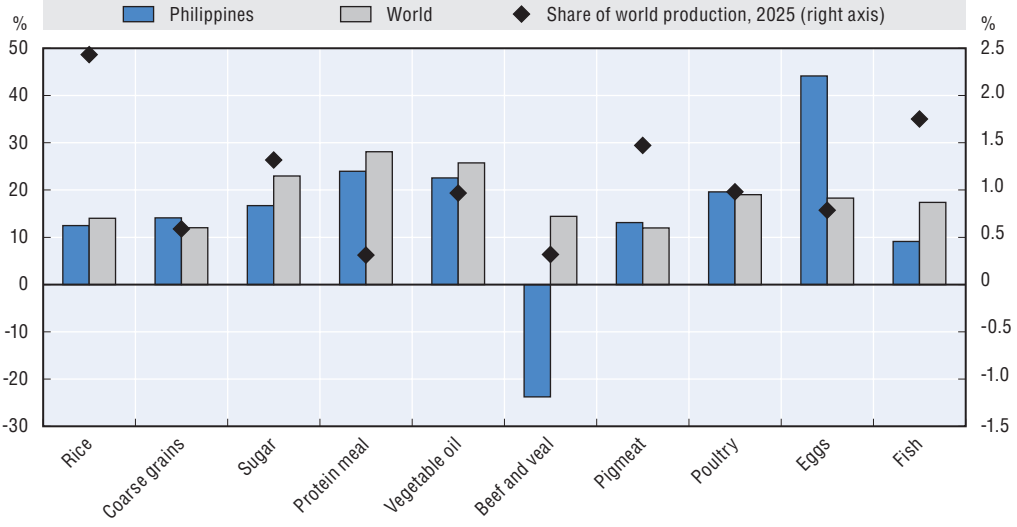
### Box 1.A1.1. **Aglink-Cosimo model methodology**

Aglink-Cosimo is an economic model that analyses supply and demand of world agriculture. It is managed by the Secretariats of the OECD and Food and Agriculture Organization of the United Nations (FAO), and used to generate the OECD-FAO Agricultural Outlook and policy scenario analysis.

Aglink-Cosimo is a recursive-dynamic, partial equilibrium model used to simulate developments of annual market balances and prices for the main agricultural commodities produced, consumed and traded worldwide. The Aglink-Cosimo country and regional modules covering the whole world, and projections are developed and maintained by the OECD and FAO Secretariats in conjunction with country experts and national administrations. Several key factors or assumptions are as follows:

- World markets for agricultural commodities are competitive, with buyers and sellers acting as price takers. Market prices are determined through a global or regional equilibrium in supply and demand.
- Domestically produced and traded commodities are viewed to be homogeneous and thus perfect substitutes by buyers and sellers. In particular, importers do not distinguish commodities by country of origin as Aglink-Cosimo is not a spatial model. Imports and exports are nevertheless determined separately. This assumption will affect the results of analysis in which trade is a major driver.
- Aglink-Cosimo is a "partial equilibrium" model for the main agricultural commodities. Non-agricultural markets are not modelled and are treated exogenously to the model. As non-agricultural markets are exogenous, hypotheses concerning the paths of key macroeconomic variables are predetermined with no accounting of feedback from developments in agricultural markets to the economy as a whole.
- Aglink-Cosimo is recursive-dynamic. Thus, each year is modelled over the projection period and depends on the outcome of previous years. Aglink-Cosimo models ten years into the future.

Figure 1.A1.1. **Production: Per cent change 2025 compared to 2013-15 average**




*Source:* OECD-FAO (2016), *Agricultural Outlook 2016-2025.*

StatLink http://dx.doi.org/10.1787/888933452379

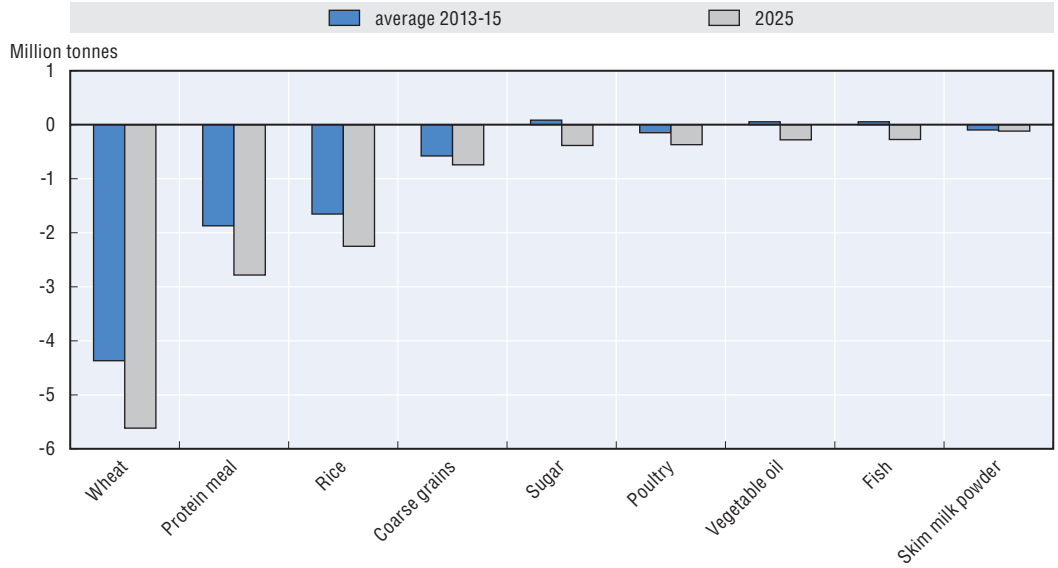
### *Main trends for selected commodities*

Philippine consumption is expected to increase by relatively more than global rates for almost all commodities in the next ten years, and the country is projected to remain a net importer for all commodities covered by the OECD-FAO projections. Net imports of cereals, poultry meat, dairy products and protein meals are projected to increase (Figure 1.A1.2).

The Philippines, a net exporter of fish and vegetables oils in 2013-15, should become a net importer of these products by 2025, reflecting the relatively low production growth rates for these commodities compared to world rates and strong projected growth in national consumption of these products. Vegetable oil production (mainly copra oil) is expected to increase by 23% over the next ten years, compared to the projected world production increase of 26% and to a national consumption increase of 43%. Fish production in the Philippines, accounting for 1.8% of world production, is expected to increase by 9% over the coming decade, compared to growth of 17% for world fish production and increased national consumption of 20% over the same period.

Philippine production growth rates are projected to be much higher than world rates for eggs and somewhat higher for coarse grains, pigmeat and poultry meat. By contrast, Philippine production growth rates for rice, sugar, protein meals, vegetable oils, beef and veal, and fish are projected to be lower than world rates. Production and consumption of eggs are expected to increase the most, by 44% each by 2025. Production of protein meals, vegetable oils, poultry meat and pigmeat should also increase by 24%, 23%, 20% and 13% respectively during the next decade, whereas beef and veal production is expected to decrease by 24% during the same period despite an expected increase in consumption of 14%.

Figure 1.A1.2. **Projected net trade for selected products, 2025 compared to 2013-15 average**




*Source:* OECD-FAO (2015), *Agricultural Outlook 2016-2025*.

StatLink http://dx.doi.org/10.1787/888933452381

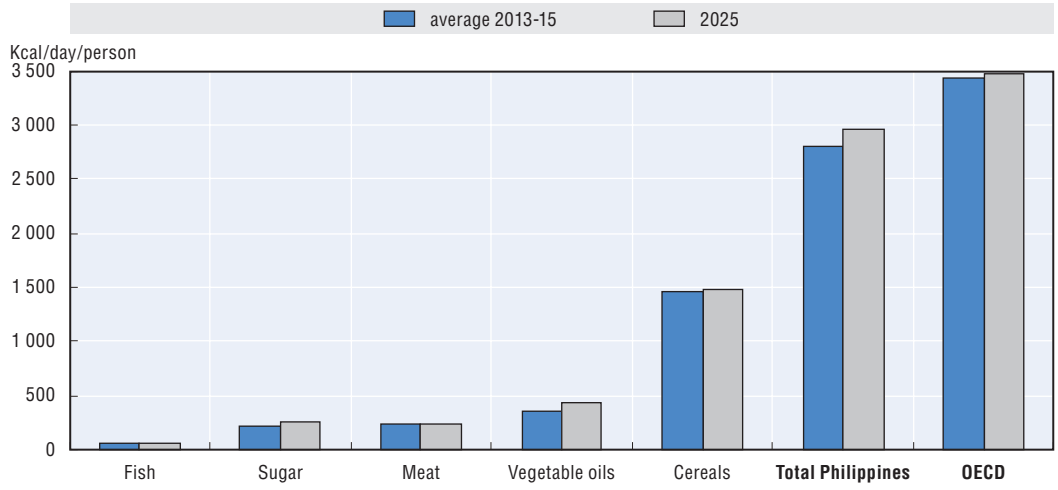
### *Caloric and protein intake in the Philippines*

Total caloric intake in the Philippines is expected to rise by 6% to 2 966 kcal per day per person by 2025, below the OECD average level at almost 3 500 kcal (Figure 1.A1.3).

Cereals are still the main staple component of the daily diet and the single most important source of dietary energy, but calories obtained from cereals are gradually being replaced by ready-made food, resulting in higher demand for sugar and in particular vegetable oils (Figure 1.A1.3). Over the next decade, the share of cereals in total caloric intake should decrease from 52.1% to 49.9%, while the share of vegetable oils is expected to increase from 12.9% to 14.6%. The share of meat in total caloric intake is expected to remain unchanged.

Protein intake on a per capita basis is projected to increase to 64.9 g/day/person by 2025, but will remain very low compared to OECD countries (Figure 1.A1.4). The share of cereals in total protein intake per capita is expected to decrease during the next decade from 44.7% to 43.2%. In turn, fish should represent a slightly more important source of protein in the Philippines in 2025, whereas the shares of meat and dairy are projected to remain almost unchanged.

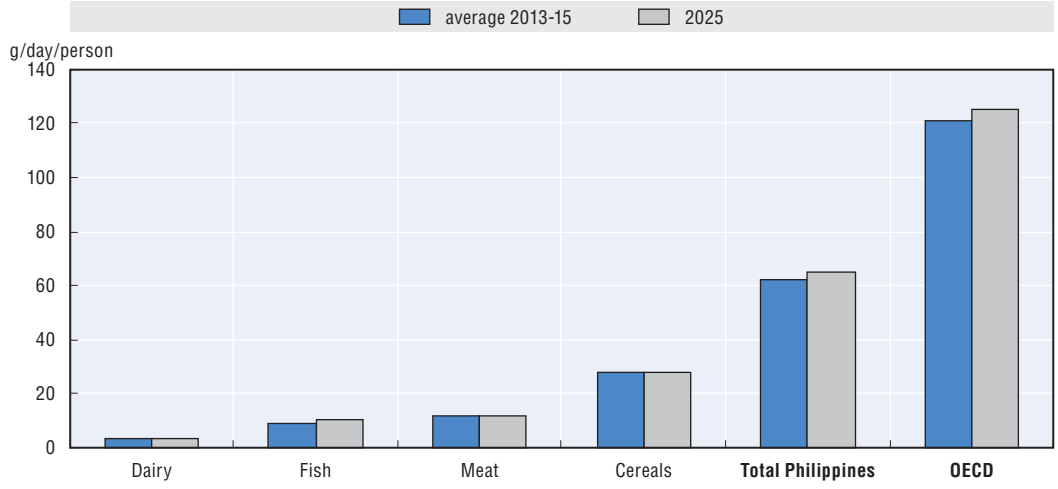
Figure 1.A1.3. **Projections of caloric intake per capita by commodity, 2025 compared to 2013-15 average**




*Source:* OECD-FAO (2015), *Agricultural Outlook 2016-2025*.

StatLink http://dx.doi.org/10.1787/888933452396

Figure 1.A1.4. **Projections of protein intake per capita by commodity, 2025 compared to 2013-15 average**




*Source:* OECD-FAO (2016), *Agricultural Outlook 2016-2025*.

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*Chapter 2*

# Trends and evaluation of agricultural policy in the Philippines

*This chapter describes the main objectives that have guided the design of Philippine agricultural policy since the beginning of the 1990s and the institutional structures established to implement that policy. It provides a systematic overview of domestic and trade policies targeting agriculture, followed by an assessment of the level and structure of support provided to the Philippine agricultural sector over the period 2000-14.*

## 2.1. Introduction

This chapter examines agricultural policy and the support provided to agricultural producers in the Philippines since 2000. Achieving food self-sufficiency, in particular in rice production, has been the main agricultural policy objective over the past decades, and price support and input subsidies have been the main policy tools. The Department of Agriculture (DA) leads the development and implementation of agricultural policies, in which several other departments and Government-Owned and Controlled Corporations play important roles. On the policy level, since 2011, inputs subsidies have been replaced by roll-over schemes to encourage adoption of high-yielding seed varieties. Expenditure on irrigation accounts for a third of annual government spending on agriculture. Tariff protection remains the main tool of trade policy and until recently has remained at high level. Trade liberalisation has mainly occurred within regional trade agreements, particularly the ASEAN Free Trade Area.

The level of support to producers as measured by the ratio of policy-related transfers from taxpayers and consumers to gross farm revenues (the percentage Producer Support Estimate, %PSE) averaged 25% in 2012-14, above the OECD average of 18%. Support for rice and sugar producers is the highest across all commodities. The total value of transfers arising from support to agriculture was equivalent to 3.3% of GDP in 2012-14, which is close to the levels in the People's Republic of China (hereafter "China") (3.0%) and Indonesia (3.4%), but much higher than the OECD average (0.7%).

## 2.2. Agricultural policy framework

This section provides an overview of the policy objectives for agriculture, the key stages of agricultural policy reform, the framework for policy implementation and the institutional arrangements for administering agricultural policy.

### *Agricultural policy objectives*

Agriculture is of paramount importance to the Philippines, both in terms of food production and income generation. The main agricultural policy objectives over the past few decades have focused on food security and poverty alleviation, to be achieved by guaranteeing a stable supply of food at affordable prices (NEDA, 2014a). Food **self-sufficiency**, particularly in rice, has been the major policy goal of all governments.

The 1997 Agriculture and Fisheries Modernization Act (AFMA, Republic Act, RA 8435), to date the most important framework law for the agricultural sector, states the following core objectives for agricultural policy: poverty alleviation and social equity; food security; rational use of resources; global competitiveness; sustainable development; empowerment of people; and protection from unfair competition (Aquino et al., 2013a). These objectives have been broadly continued in subsequent policy planning documents, including the Philippine Development Plan for 2011-16, but new objectives have also been added such as improving sector's resilience to risks, in particular those related to climate change (Chapter 3), and food safety.

## *Basic stages of agricultural policy reform*

### *1970-86: Heavy government involvement*

Up to the end of the 1970s, the **macroeconomic policies** of the Philippines did not favour the development of the agricultural sector. The import tariff and export tax structures were biased against agriculture and agricultural trade and favoured import-competing, non-agricultural industries. This industrialisation strategy resulted in an artificial increase in prices for manufactured goods and relative reduction in prices for food and raw materials. The policy was supported by an overvalued exchange rate arising from foreign exchange and import controls (Piadozo, 2012).

Moreover, a sequence of unfavourable weather events in the beginning of the 1970s led the government to take **monopoly control** over rice and maize trade. The National Grains Authority was established in 1972, and was later renamed as the National Food Authority (NFA) which still operates today (Intal and Garcia, 2005). Sugar trade was also nationalised under the National Sugar Trading Corporation.

At the same time as heavy government intervention in markets, high-yielding rice technology was developed which increased production as part of the **green revolution**. In 1973, the new technology was disseminated under the *Masagana 99* production programme, the purpose of which was to help the Philippines attain self-sufficiency in rice and eventually become a net rice exporter. Farmers were encouraged to use new high-yielding varieties of rice as well as fertilisers and pesticides. Public spending was increased (particularly on irrigation), financed by a mix of taxes on major agricultural exports and foreign loans (David et al., 2012). Access to credit and to extension services was facilitated; for example, financial institutions were legally obliged to provide 25% of their loans to the agricultural sector (DA, 2015). The *Masagana 99* programme lasted for 15 years and led to a substantial increase in rice production. Rice self-sufficiency was achieved and the Philippines became a net-exporter of rice over the period 1978-83 (Hernandez, 2013; Galero et al., 2014).

### *1986-2000: Towards liberalisation*

Although world market commodity prices had started to fall by the late 1970s, the Marcos administration maintained policies and measures originally implemented in the period of high world market prices. The end of the Marcos administration in 1986 saw **liberalisation** of agricultural policies. A range of reforms undertaken in the 1990s aimed at improving services provided to agriculture, particularly extension services, and infrastructure and the private sector assumed a greater role in agricultural credit policy. Market interventions were also reduced, as were tariffs and non-tariff measures on agro-food imports, and export taxes and the coconut export ban were abolished. The responsibilities of the NFA were reduced and the Sugar Trading Corporation was replaced by the Sugar Regulatory Administration, which had no power to engage in direct marketing operations (David et al., 2009).

**The Comprehensive Agrarian Reform Program (CARP)**, a government initiative aimed at granting landless farmers and farmworkers ownership of agricultural lands, was launched in 1988. The scope of land covered by the reform evolved over time, but it is estimated that about 7.9 million ha, or about three-quarters of total agricultural land, was covered. The original deadline for completion was 1998, but it has been extended twice. While the distribution of land has almost been completed, the economic and social effects of the reform are mixed (Chapter 1).

Efforts to liberalise trade policy such as through the removal of quantitative restrictions on imports of agricultural commodities were halted by the adoption of the Magna Carta for Small Farmers in 1991 which imposed restrictions on agricultural imports that were deemed to compete with domestic production (David et al., 2009).

The policy of self-sufficiency in rice continued. Several programmes to **enhance rice productivity** were launched by the DA. The strategy involved the provision of input subsidies to farmers, mainly fertilisers and certified seeds of inbred high-yielding rice varieties, but also credit facilitation and support to public services for agriculture, like investments in irrigation and farm-to-market roads. Public expenditures on input subsidies declined substantially in the late 1990s, due to the tight fiscal policies adopted in the aftermath of the 1997 Asian Financial Crisis (Bordey, 2010).

At the beginning of the 1990s, the Philippines also negotiated a number of **trade agreements**. The country was one of the founding members of the ASEAN Free Trade Area (AFTA) in 1992. In 1995, the Philippines joined the WTO and committed itself to removing quantitative restrictions on imports of sensitive agricultural products, with the exception of rice, and to a gradual liberalisation of agriculture. In the early 1990s, the Philippines also launched consecutive unilateral Tariff Reform Programs to reduce tariffs and remove quantitative trade restrictions. The government adopted the AFMA budget and action plan in 1997, which provided safety nets to facilitate farmers' adjustment to changes in trade policy. One strategic objective of the AFMA was to transform Philippine agriculture from being resource-based to becoming technology- and market-driven. However, it also made self-sufficiency in rice official government policy.

The programmes of liberalisation, reform and production support did not bring the expected increase in productivity, nor were they successful in modernising Philippine agriculture. Several researchers (Habito and Briones, 2005; Cororaton and Corong, 2009) argue that one of the main reasons was that agriculture remained penalised by macroeconomic policies and that support was still concentrated on input subsidies and financing mostly private goods and services, with promised expenditures on public services such as farm-to-market roads, irrigation, and post-harvest facilities lower than planned (Habito and Briones, 2005). High protection against rice imports resulted in higher prices in the Philippines than on world markets, yet because the increase in rice production could not keep pace with consumption growth, rice imports increased to meet the gap.

### *2000 to present: Increasing public support to agriculture*

During the 2000s, the government undertook some policy measures to further **reduce market interventions** in agriculture. In particular, subsidised credit programmes were terminated and private traders allowed to import rice, albeit at very limited levels.

However, the focus on food (rice) self-sufficiency was further reinforced. Various programmes were instituted under AFMA to increase rice productivity (Cororaton and Corong, 2009). The composition of budgetary support to agriculture in the first half of the 2000s was increasingly biased towards rice: the share of the total agricultural budget devoted to supporting rice production increased from about 40% in 2000 to nearly 60% in 2005. Yet despite efforts to increase rice production, the government was not able to reduce dependency on rice imports.

After the global food price crisis in 2008, **budgetary spending on agriculture increased** substantially. The government concentrated on intensifying rice production enhancement programmes, increasing public expenditure on irrigation and input subsidies to achieve self-sufficiency in rice by 2013 (later changed to 2016).

The new **National Development Plan for 2011-16** aimed to address the major challenges facing the agricultural sector, namely the high cost of agricultural inputs, inefficient supply chain and logistics systems, inadequate provision of irrigation infrastructure, low rate of adoption of technologies, and limited access to formal credit (WTO, 2012).

The **Food Staples Sufficiency Program (FSSP)**, launched in 2011, reflected the food security policy. The FSSP retained a strong focus on rice and other staples such as white corn, banana (saba), cassava and sweet potato, but shifted the emphasis away from input subsidies towards public services to agriculture such as extension and infrastructure (e.g. farm-to-market roads).

The **Food Safety Act** (RA 10611), adopted in 2013, unifies all food safety regulations in the Philippines. The objectives of the law are to protect consumer health; enhance industry and consumer confidence in the food regulatory system; and promote fair trade practices and a sound regulatory foundation for domestic and international trade. In 2015, the implementing rules and regulations were signed by Secretaries of DA and Department of Health.

### *Framework for policy implementation*

#### *Laws and regulations*

The **1987 Philippine Constitution** is the ultimate law of the Philippines. The Congress of the Philippines (*Kongreso ng Pilipinas*) is the national legislative body. Laws passed by the Congress are titled as **Republic Acts (RA)**. Every bill passed by both chambers in identical form and signed by the President becomes a law. In the case of the exercise of a Presidential veto, Congress can override the veto with a two-thirds majority in both chambers (voting separately), after which the bill becomes law. Laws can only be changed, revoked or amended by an Act of Congress. The executive branch, through its regulatory agencies and departments, can issue **orders** that have the force and effect of a law, though they are not officially laws but simply rules or administrative regulations to facilitate implementation of laws enacted by Congress. The President, as the chief executive, signs these orders that can be: executive orders (EO), administrative orders, proclamations, memorandum orders, memorandum circulars or general or specific orders, depending on their substance and in accordance with the Administrative Code of the Philippines. These orders regulate or direct behaviour of firms and individuals, but may be revoked, amended or changed by the succeeding President. Local governments may issue ordinances or local executive orders that pass through an approval process at local councils. The list of major laws regulating the agricultural sector is presented in Table 2.A1.1.

The most important legal document guiding Philippine agriculture is the **AFMA**, adopted in 1997. The AFMA was created to provide the policy framework and support measures to enhance competitiveness and the modernisation of the agricultural sector. The law was driven by the government's commitment to provide safety nets for farmers to help them cope with trade reforms undertaken under the WTO. AFMA is financed through the General Appropriations Act (GAA), the official document indicating the allocation of funds by the Philippine government.

Implementation of AFMA, which started in 2001, is based on the Administrative Order No. 6 from 1998 Implementing Rules and Regulations (IRR) issued by the DA.

The AFMA has been implemented through the **Agricultural and Fisheries Modernization Plan**, which integrates all development plans and agricultural policy measures for the modernisation of the agricultural sector. The plan covers a wide range of agricultural policy areas: the agriculture and fisheries modernisation plan, human resource development, research development and extension, rural non-farm employment, trade and fiscal incentives, production and marketing support services, infrastructure (including post-harvest infrastructure), credit, the basic needs programme, irrigation, training, product standardisation and consumer safety. Also under AFMA, the **Agro-industry Modernisation Credit and Financing Program (AMCFP)** provides credit assistance to small and medium size enterprises and makes credit accessible to all, regardless of economic status (NAFC, 2007).

**Strategic Agriculture and Fishery Development Zones** are one of AFMA's key implementation tools intended to concentrate agricultural development in pre-defined areas and redirect urban development away from those areas. All lands suitable for agriculture are to be identified, set aside, and protected from future conversion to competing uses, e.g. urban development. Agricultural production should also be maximised without causing irreversible environmental problems (Briones, 2005). The zones are intended to focus government resources on areas where they can have the greatest impact on agricultural productivity and poverty reduction. Strategic Agriculture and Fishery Development Zones cover 10.64 million hectares (SEPO, 2014), including irrigated or irrigable agricultural lands, that is, almost all areas currently classified as agricultural land.

### *National development plan*

The National Economic and Development Authority (NEDA) formulates national and regional **development plans** and **public investment plans** in the Philippines. The NEDA Board is the government's highest socio-economic planning body, chaired by the President. There are three types of development plans in the Philippines: the national-level Medium-Term Philippine Development Plans (MTPDPs); the Regional Development Plans (RDPs); and the Local Development Plans. In addition, the Medium-Term Public Investment Programs and Regional Development Investment Programs are prepared by taking the targets, goals and strategies specified in the MTPDPs and the RDPs and translating them into specific, time-bound activities in the form of programmes and projects (Ohno and Shimamura, 2007).

Philippine Development Plans serve as a guide for formulating policies and implementing development programmes for **six years** (coinciding with the presidential term) and are updated and revised in their third year. The plans provide cost estimates for the proposed strategies or programmes. Indicative budgetary allocations are reflected in the Public Investment Plan, developed in conjunction with the National Development Plan to set out in more detail key programmes, activities, and projects. However, these have no binding effect on the subsequent investment selection and budgeting process.

The **Philippine Development Plan 2011-16** aims to promote a framework of inclusive and sustained growth that generates mass employment and reduces poverty. The agricultural sector is seen to play important role in developing and improving living conditions. To

achieve competitiveness and sustainability in the agricultural sector, the medium-term update of the Development Plan sets out three priorities: increase productivity; increase forward linkages with the industry and services sectors; and improve sector resilience to risks, including climate change (NEDA, 2014a). To achieve these objectives, the following actions are planned:

- Increase investments for **research and development** as well as extension services; speed up Agrarian Reform (distribution of individual land titles to provide greater security of tenure and improve access to finance for agrarian reform beneficiaries).
- Provide **training** for farmers in terms of value-adding, agri-business development and value chain management; strengthen farmers' groups and co-operatives; and encourage public-private sector partnerships to finance infrastructure or certain postharvest facilities.
- Encourage **diversity of production** and livelihood sources; strengthen the insurance system; and adapt the community-based employment programme to function as a social protection mechanism (NEDA, 2014a).

### *Institutional arrangements for administering agricultural policy*

The agricultural sector is governed at both the national and local levels. Four key departments of the Philippine government are responsible for rural and agricultural development: the DA, the Department of Environment and Natural Resources (DENR), the Department of Agrarian Reform (DAR) and the Department of Interior and Local Government (DILG) (Figure 2.1). Additionally, the Department of Science and Technology (DOST) has an important role in co-ordinating agricultural research.[1]

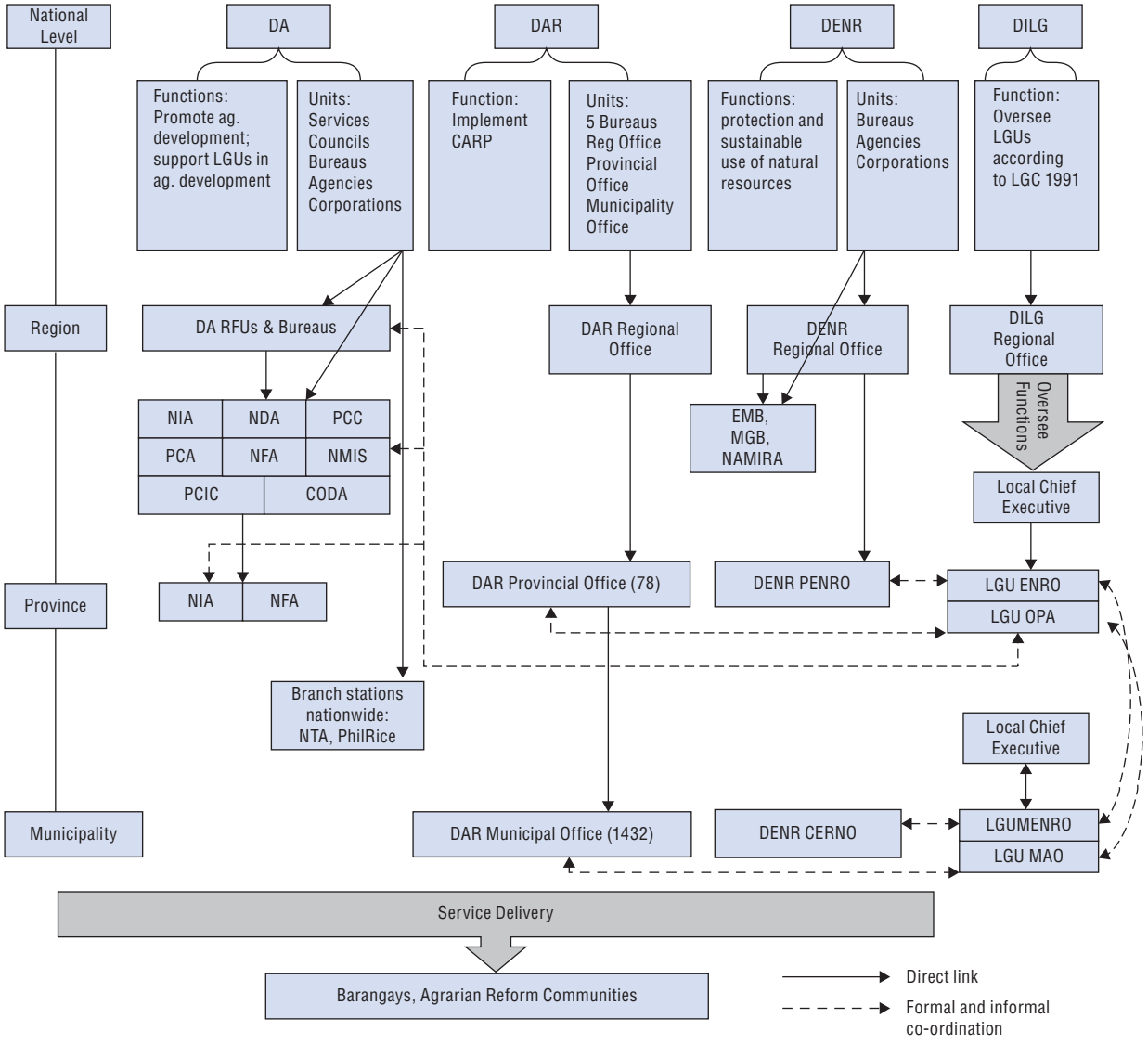
#### *Department of Agriculture*

At the national level, the **Department of Agriculture** is the main agency responsible for the promotion of agricultural development and growth. It provides the policy framework, public investments and support services needed for domestic and export-oriented business enterprises. The organisational structure of the DA is complex; as at early December 2016 it consisted of ten services, 15 regional offices, six bureaus, seven attached agencies (Table 2.A1.2) and seven Government-Owned and Controlled Corporations (GOCCs) that represent a mix of commodity and function-focused structures (Table 2.1). The bureaus are core units of the DA and are generally responsible for undertaking or providing specialist and technical functions and services.

Attached agencies and corporations may have single functions, i.e. rice research (PhilRice); market or technical regulations (National Food Authority, NFA; Fertiliser and Pesticide Authority, FPA); infrastructure development (National Irrigation Administration, NIA); or a whole range of functions, i.e. research, extension, marketing and other regulatory functions (Philippine Coconut Authority, PCA; Sugar Regulatory Administration, SRA; National Tobacco Administration, NTA; National Dairy Authority, NDA) (David, 1997).

In addition to functions at the national level, the DA also has 15 regional offices that mainly deliver extension services. Agricultural policy measures are implemented by local governments as the DA does not have local representation at the provincial or municipal level (Figure 2.1).

Figure 2.1. **Organisational framework of agricultural policy implementation in the Philippines**




| | |
|---|---|
| CODA | Cotton Development Administration |
| DILG | Department of Interior and Local Government |
| EMB | Environmental Management Bureau |
| MAO | Municipal Agriculture Officer |
| MGB | Mines and Geosciences Bureau |
| NAMIRA | National Mapping and Resource Information Agency |
| NDA | National Dairy Authority |
| NFA | National Food Authority |
| NIA | National Irrigation Administration |
| NMIS | National Meat Inspection Service |
| OPA | Office of Provincial Agriculturist |
| PCA | Philippine Coconut Authority |
| PCC | Philippine Carabao Center |
| PCIC | Philippine Crop Insurance Corporation |
| PhilRice | Philippine Rice Research Institute |
| P/CERNO | Provincial/Community Environment and National Resources Offices |
| RFU | Regional Field Unit |

*Source:* Lange (2009).

The DA has two attached councils:

- The **Philippine Council for Agriculture and Fisheries** (PCAF) was initially established in 1987 as the National Agricultural and Fishery Council (NAFC) to serve as an advisory body at the regional, provincial, and municipal levels to promote private sector participation in agricultural and fishery development through consultation, advocacy, planning and monitoring and project evaluation. In 2004, the NAFC and the Livestock Development Council

were merged to form what is now the PCAF, with the aim of moving from sector-specific to more holistic coverage of agriculture and fisheries issues. The main role of PCAF is to serve as consultative and feedback mechanism on the policies, plans and programmes of the DA.[2] The tasks of PCAF also include AFMA monitoring, assisting the DA in mobilising and evaluating the contributions of government agencies to agriculture and fishery modernisation, and promoting consensus on national and local budgets for agriculture and fisheries.

- **The Agricultural Credit Policy Council** (ACPC) was created in 1986. It plays a unique strategic role in improving the access of small farmers to formal credit. It is the only agency with the legal authority to synchronise all government agricultural credit policies and financing programmes. The ACPC is mandated to formulate credit policies and programmes and oversee the implementation of AMCFP. Among the tasks of ACPC is to provide certification of eligibility of bonds and other debt securities, and accreditation of non-bank rural financial institutions under the Agri-Agra Reform Credit Act (RA 10000 from 2009), the purpose of which is to enhance the access of agricultural sector to financial services and programmes. The Act mandates all banking institutions to set aside at least 25% of their total loanable funds for agriculture and fisheries credits, of which at least 10% should be for agrarian reform beneficiaries. ACPC has also begun to participate in the management of certain credit programmes. ACPC's commitment under the Philippine Development Plan (PDP) 2011-16 is to further increase formal borrowing in the sector from 57% in 2008 to 85% by 2016, requiring an annual increase in formal borrowing of 4% until 2016.

### *Government-Owned and Controlled Corporations*

The most influential GOCC is the **National Food Authority** (NFA). Created in 1981, it took over the tasks of the National Grains Authority, which was responsible for promoting the growth of the grains industry (rice, maize, wheat and feed grains as well as their substitutes such as mung beans, soybeans and cassava). The NFA is mandated to strengthen the development of the food industry and ensure the adequate and continuous supply of food items at reasonable prices. Soon after its foundation in 1985, along with the deregulation of prices and markets[3], the NFA's responsibilities were limited to rice and maize, including exclusive authority to import rice. However, in 1997, the NFA was given the right to stabilise sugar prices as necessary (EO No 398, 2007). Following El Niño in 1998, the NFA's responsibilities were further extended to include interventions to stabilise the prices and supply of basic food items (rice, sugar, cooking oil, milk, coffee, sardines and noodles) as necessary (SEPO, 2006).

Today, the **NFA's main role** is to ensure national food security and stabilisation of supply and prices of staple cereals at both farm and consumer levels. Its main activities are the procurement of paddy rice (*palay*) from farmers and their organisations, buffer stocking, processing activities, and distribution of paddy rice and milled rice to strategic locations and to various marketing outlets (SEPO, 2006). NFA also grants import permits for rice. In addition, it has a number of tasks related to market regulation: monitoring grain storage; seizing stocks in case of hoarding; establishing and enforcing standards in grading, sampling and inspection; registering, licensing and supervising warehouse, mills and other businesses related to grains; and controlling export of grains. The NFA also regulates rice-related processing and servicing activities by issuing licenses, including: mechanical trying, threshing and other post production processes, transportation, milling, warehousing, manufacture of rice-based and maize-based products, grains packaging, retailing, wholesaling, importing, exporting and indenting (Briones and de la Peña, 2015).

Under its mandate, the NFA has to fulfil two **contrasting tasks**: to buy paddy rice from farmers at higher-than-market prices and sell rice to consumers at a price lower-than-market prices. Hence, the activities of the NFA are very costly. The NFA is financed from the national budget at PHP 4.25 billion (USD 96 million) annually (2013-14), but it is also authorised to borrow from commercial banks backed by a government guarantee and is exempt from all kinds of taxes, duties and fees. The NFA has consistently incurred **losses** since 1999, but a large part of its debt was incurred over 2007-10 due to increased rice imports and the "food price crisis", when world market prices of rice surged (Briones, 2014). NFA's outstanding debt reached PHP 170 billion (USD 3.8 million) in 2010 and had only decreased to PHP 155 billion (USD 3.7 billion) by 2013 (Montes et al., 2015). As budgetary allocations are only sufficient to cover cost of public stockholding, debt servicing in recent years has been financed from sales of imported rice at lower-than-domestic-market – but much higher than international market – prices (Figure 2.9 below). Several attempts have been made to reform the NFA in order to increase its efficiency and streamline or privatise certain activities. In addition, authority over the NFA has been transferred between the Office of President and the DA several times, most recently to the Office of Cabinet Secretary at the Office of the President (Table 2.A1.3).

Table 2.1. **Major Government-Owned and Controlled Corporations, November 2016**

| Name | Activities |
|---|---|
| National Food Authority, NFA | The NFA is the state trading enterprise, created in 1981. It controls rice trade, has the right to intervene in the domestic rice market and holds public rice stocks. |
| National Irrigation Administration, NIA | The NIA is responsible for irrigation development and management. Created in 1963, its main tasks include: investigating and developing all available water resources for irrigation purposes; planning and constructing all types of irrigation projects; operating and maintaining all national irrigation systems; and supervising the operation of communal and pump irrigation systems. |
| Sugar Regulatory Administration, SRA | The SRA was created in 1986. Its main objective is to promote the growth and development of the sugar industry through greater participation of the private sector and to improve working conditions. Since 2006, when the Biofuels Act was adopted, the SRA has also been responsible for developing and implementing policies supporting the Philippine Biofuels Program and ensuring security of the domestic sugar supply. The SRA has been self-financing since 2007 and receives no subsidies from the government. |
| Philippine Coconut Authority, PCA | The PCA is responsible for developing the coconut and other palm oil industry. Created in 1973, it implements nationwide coconut planting and replanting, fertilisation and rehabilitation, and other farm productivity programmes. The PCA conducts research and extension works on farm productivity and process development for product quality and diversification. It also establishes quality standards for coconut and palm products and by-products and develops domestic and foreign markets. |
| Quedan Corporation, QuedanCor | The Quedan Guarantee Fund Board (QGFB) was created in 1978 to accelerate the flow of investment and credit into the countryside through the various quedan (Box 2.2) credit and guarantee programmes. In 1992, the QGFB was reorganised into QuedanCor. 60% of the QuedanCor is government-owned and the remaining 40% is owned by farmers, fishermen and private investors. QuedanCor has 14 Regional Offices. Presently, it is implementing the QuedanCor Agricultural Credit Guarantee for Rural Productivity, Agri-fishery and Livelihood Projects. |
| National Dairy Authority, NDA | The NDA, created in 1995, is the DA's primary agency overseeing and supporting the development of the dairy sector with a special emphasis improving local supply of fresh milk. The NDA aims to accelerate dairy herd build-up and milk production, enhance the dairy business through delivery of technical services, increase coverage of milk feeding programmes and promote milk consumption. The NDA also holds the dairy functions of the Livestock Development Council, the Dairy Division of the Bureau of Animal Industry and the Livelihood Corporation's Laguna Processing Center. |
| National Tobacco Administration, NTA | The NTA was created in 1987 to improve the economic and living conditions of tobacco farmers including those who depend upon the industry for their livelihood; and to promote the balanced and integrated growth and development of the tobacco industry to help make agriculture a solid base for industrialisation. The NTA: i) provides financial support to registered farmers; ii) assists tobacco farmers in developing alternative farming systems; iii) provides scholarships for dependents of tobacco farmers; and iv) undertakes studies concerning technologies and methods to reduce the risk of dependence on or injury from tobacco product usage and exposure, as well as research into the development of alternative uses of tobacco. |
| Philippine Crop Insurance Corporation, PCIC | The PCIC was created in 1978 as the implementing agency for the government's agricultural insurance programme. PCIC provides insurance protection to farmers and fishermen against losses arising from natural calamities, plant diseases and pest infestations. The PCIC also provides insurance protection against damage to or loss of non-crop agricultural assets, including machinery, equipment, transport facilities and other related infrastructures. |
| Philippine Rice Research Institute, PhilRice | PhilRice was created in 1985 to help rice self-sufficiency by increasing the productivity and profitability of rice farmers. Its task is to develop high-yielding and cost-reducing rice production technologies. It has six branch stations and liaises with a network of 57 agencies and 70 seed centres strategically located nationwide. |
| Philippine Fisheries Development Authority (PFDA) | The PFDA was created in 1976 to monitor and promote the development of fishing industry. It focuses on the provision of post-harvest infrastructure facilities and other services to enhance quality and efficiency in the handling and distribution of fish and fishery products. |

*Source:* DA (2016).

### *The Department of Environment and Natural Resources*

The DENR is responsible for ensuring the sustainable use of natural resources and environmental protection. It has regulatory power over natural resources and land and is mandated to protect and promote the environmental resources of the Philippines. It consists of a variety of offices and attached agencies as well as offices at the regional, provincial and municipal levels.

### *The Department of Agrarian Reform*

DAR is responsible for implementing the Comprehensive Agrarian Reform Program (CARP) (Chapter 1), which includes interventions in sustainable agriculture, rural infrastructure, rural industrialisation, investment and marketing assistance, credit assistance and community-based resource management. Established under CARP, the Agrarian Reform Fund finances both the cost of land acquisition and distribution, and the provision of complementary support services to agrarian reform beneficiaries. DAR has 7 services, 5 bureaus, 15 regional offices and 79 provincial offices (DAR Provincial Agrarian Reform Offices). Furthermore, DAR maintains Municipal Agrarian Reform Offices in key municipalities and cities throughout the country.

### *Department of Interior and Local Government*

The DILG supervises the activities of the local government units (LGUs). In 1991, a Local Government Code was enacted that **decentralised** the administration of local public goods from the national level to the LGUs. Many functions of the DA were devolved to LGUs, among them agricultural extension, communal irrigation systems and farm-to-market roads. The move towards decentralisation was further strengthened by adoption of the AFMA, which emphasised local agricultural development planning, provided more resources to LGUs and ensured more operational links between provincial and municipal agricultural plans and programmes. However, LGUs have remained partly dependent on fiscal transfers from the national government to cover local development expenditures.

Local governance is allocated at three levels in the Philippines: provincial, municipal (city) and *barangay*, the smallest administrative unit (David, 1997). The **responsibilities of LGUs** include:

- ***Barangay* level**: agricultural support services; planting material distribution system; operation of farm produce collection and buying stations.
- **Municipality level**: agricultural extension and on-site research services; distribution of livestock and poultry; distribution of rice, maize and vegetable seeds to farms; seedling nurseries; demonstration farms; quality control of copra; improvement of local distribution channels; small-scale inter-Barangay irrigation systems; and public markets and slaughterhouses.
- **Province level**: agricultural extension and on-site research services; prevention and control of plant and animal pests and diseases; dairy farms, livestock markets, animal breeding stations and artificial insemination centres; assistance in organisation of farmers' co-operatives[4].

### *Department of Science and Technology*

The DOST is responsible for promoting and assisting scientific and technological research in priority areas, including agriculture, and for co-ordinating funding of the National Science and Technology Plan. The Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (PCAARRD) under DOST is responsible for research in agriculture.

### *Other institutions involved in agricultural policy implementation*

Beyond the five key institutions discussed above, a large number of other institutions are involved in the implementation of agricultural policy in the Philippines. The most important are:

- **Office of the Presidential Assistant for Food Security and Agricultural Modernisation** (OPAFSAM). This was a cabinet-level position under the Office of the President created on 5 May 2014 by President Benigno Aquino III to oversight the largest four GOCCs: the National Food Authority (NFA), the National Irrigation Administration (NIA), the Fertiliser and Pesticide Authority (FPA) and the Philippine Coconut Authority (PCA) with respect to the implementation of policies, programmes, projects and activities. In July 2016, Executive Order No. 1 placed NFA and PCA under the Office of the President. While as at early December 2016 there was no official document defining the affiliation of the FPA and NIA, it is presumed that they remained under the Office of the President.
- **Food Security Committee**. The committee meets quarterly (or as often as needed) to assess the supply-demand situation for rice and makes recommendations on rice imports to the Council of NFA, who in turn makes a recommendation for approval by the President. The Committee was established in 2014 and is chaired by the Secretary of NEDA. It replaces the previous Inter-Agency Committee on Rice and Corn.
- **Land Bank of the Philippines** (LBP). A governmental financial institution, the LBP was originally the agency for implementing CARP; today, it has become the largest formal credit institution in rural areas and has evolved to a full service commercial bank. It is also responsible for implementing the government's credit assistance programmes to small farmers.

### *Farmers' organisations*

Farmers' organisations (FOs) provide a variety of **services** to their members such as input purchases, extension advice, marketing, export, and certification. The Magna Carta for Small Farmers (RA 7607 from 1992) gives farmers' organisations the right to be represented on the boards of government agencies, including PCA, NIA, NFA and PCIC.

## *Financing agricultural policies*

The General Appropriations Act (GAA) is a **budget law** signed annually by the President and approved by Congress. The Department of Budget Management (DBM) is responsible for preparation, execution and control of expenditures for all three levels of government – national government departments and agencies, GOCCs and LGUs. Expenditures for the agricultural sector are considered funds of the following institutions: the DA and its attached agencies and corporations; DAR; the LBP; the budget from the Agrarian Reform Fund[5] and the Philippine Council for Agriculture and Resources Research and Development (PCARRD). Historically, the DA accounted for the largest share of public spending on agriculture, but a sizable component is under direct control of the Office of the Secretary of Agriculture (Briones, 2013).

In 2012, the government started implementing a **bottom-up-budgeting** process to involve communities and local governments in crafting the budget. The programme was initially targeted to the poorest municipalities and cities to develop local poverty reduction programmes and projects but in 2015, it was extended to all municipalities and cities. The DA is one of the participating agencies and finances activities related to agriculture.

## 2.3. Domestic policies

This section discusses domestic agriculture related policy measures, including price support, input subsidies, credit policy, agricultural insurance systems and support to infrastructure development.

### *Price support measures*

#### *Rice and maize*

The government's price support policy has multiple stated goals: to safeguard farmers from severe price fluctuations, particularly during peak harvest months; to assure farmers a ready market at a price that guarantees a fair return on investment; to encourage production and post-production efficiency; and to serve as guidance to grain traders on price levels (DA, 2015). Price support policy in the Philippines mainly affects **rice**, but may be extended to maize if necessary, and the prices of sugar and other basic food items may also be subject to intervention[6]. Price support policy is implemented by the NFA through the following mechanisms: support price, release price, government procurement, and import restrictions. The NFA may also accumulate buffer stocks of rice to stabilise consumer price levels and ensure adequate and continuous supply (Box 2.1).

**The government support price** is applied by the government when buying from farmers. The Food Security Committee recommends a support price to the Secretary of Agriculture and NFA management, which is then submitted to the President of the Philippines for final approval (DA, 2015).

The NFA buys rice from farmers and farmer organisations at a government-set support price. Farmers are not obliged to sell their paddy rice to the NFA; they can also sell it directly to millers and traders. Under the Farmers Option Buy Back Scheme, the farmer has the option to buy back the same volume of rice at the same price within the following six months, to benefit from any price increase above the NFA support price (WTO, 2012). When the market price falls under the set support price, the NFA begins **procurement**, concentrated in 37 major rice-surplus provinces. The volume of procurement depends upon the magnitude of production and the prevailing market situation (DA, 2015). During the past twenty years, the volume of procurement as a share of total paddy rice production has varied between 0.1% in 1995 to 5.4% in 2000 (Figure 2.2). The government's procurement price has exceeded the market price for most years, but since 1990, there have been 7 years in which it was lower (Figure 2.3). The gap between the NFA's support price for paddy rice and the market price was largest in 2008, when a sharp increase in the support price (Figure 2.3) resulted in the highest level of procurement since 1980 (Briones and de la Peña, 2015). However, during the whole 1995-2015 period, both the NFA support price and the producer price for paddy rice were significantly higher than the border reference price for rice adjusted to the farm gate level, indicating a high level of market price support for rice producers (Figure 2.2 and Section 2.5).

In addition to the support price, the NFA provides three types of **procurement incentive payments**: a drying incentive, a delivery (or transport) incentive, and a co-operative incentive. The drying incentive reduces farmers' drying costs and improves storability of the paddy rice. The delivery incentive is paid when grain is delivered directly to the NFA warehouse. The co-operative incentive is provided to FOs that sell to NFA. The co-operative incentive is not paid to the FOs immediately after the delivery of the paddy rice to NFA; rather it is accumulated in a Cooperative Development Incentive Fund, which can be used when FO buy equipment, inputs or services, or make an investment (SEPO, 2010).[7] The procurement of **maize** has been minimal, ranging between 0% and 1.6% of the total production of maize.

### Box 2.1. **Public stockholding**

The **government buffer stock** is kept for both food security and price stabilisation purposes. The NFA is responsible for maintaining the stock, which is accumulated through direct purchases of paddy rice from farmers at the government-set support price. Paddy rice is stored and then milled with enough lead time before planned distribution of rice in the market. The rice is sold in the market when commercial prices rise (DA, 2015).

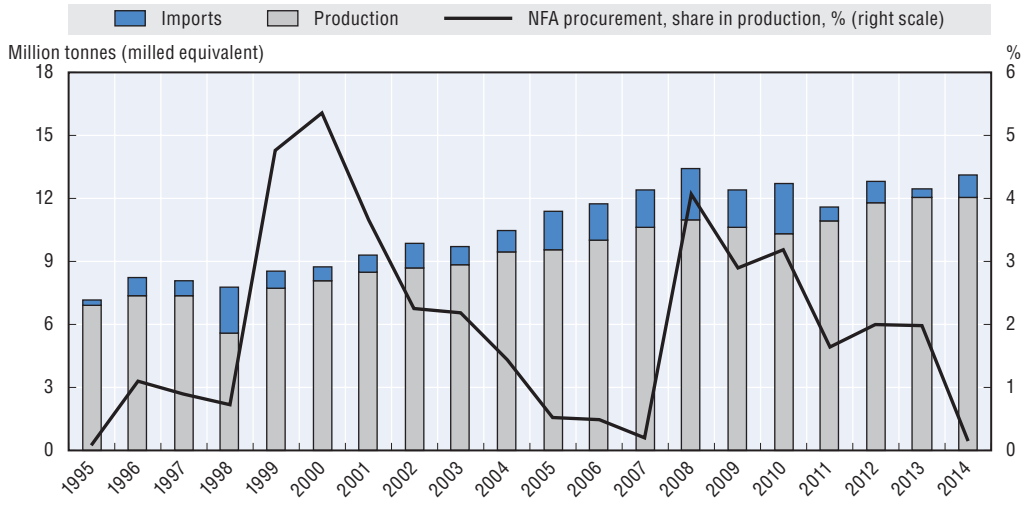
There are four different mandatory levels and timeframes for buffer stock holding in the Philippines:

- **Strategic Rice Reserve**: Equivalent to a minimum of 15 days of national rice consumption. This reserve is maintained year round in government warehouses for food security purposes in case of calamities or emergencies.
- **Government Rice Buffer Stock**: Equivalent to at least 30 days of national rice consumption that should be available by 1 July every year, including the 15-day Strategic Rice Reserve for stabilisation purposes in deficit areas and during lean periods. The NFA, however, follows the government's decision that the national stock should be equivalent to 90 days' consumption, comprised of government stocks (30 days) and the balance being held by households and private warehouses (SEPO, 2010).
- **ASEAN Plus Three Emergency Rice Reserve**: After the food price crisis in 2008, ASEAN approved the ASEAN Integrated Food Security Framework, with the ASEAN Plus Three Emergency Rice Reserve as one of its main components. Signed in 2011 between ten members of ASEAN plus China, Japan and South Korea, countries committed to the principles of mutual assistance during times of food emergency, including information sharing, earmarking, and stockpiling. This new framework built on the previous Agreement of the ASEAN Food Security Reserve established in 1979, increasing the size of the reserve from the previous 50 000 to 787 000 tonnes (Briones, 2011). The Philippines committed to maintain 12 000 tonnes of rice at any given time for the use of other ASEAN member countries in case of an emergency.
- **Emergency Relief Operations**: The NFA provides rice to relief agencies such as the Department of Social Welfare and Development and the National Disaster Coordinating Council, and may also release rice to LGUs and others participating in relief operations (DA 2015).

The NFA has adopted a monitoring system called the **Commercial Stock Survey** which it uses to generate estimates on commercial rice and maize stock inventories held by the commercial sector at the national, regional and provincial level. The survey is a regular undertaking conducted over the last two days of each month and the first two days of the next month (DA, 2015).

The NFA is the only institution authorised to **import rice**, and imports only take place when there is an actual or projected shortage of rice. The Food Security Committee regularly evaluates the country's supply and demand situation. The NFA Council assesses their evaluation and submits a recommendation to the President on the probable volume of rice to be imported. After Presidential approval has been given, the NFA organises public bidding. Rice imports without public bidding are allowed under the Government-to-Government Procurement Scheme. NFA can allocate rice imports under the Minimum Access Volume (Section 2.4) to licensed private importers. These volumes are announced annually in major newspapers and are allocated to licensed importers on a first-come first-served basis, upon payment of Advanced Customs Duties via the LBP.

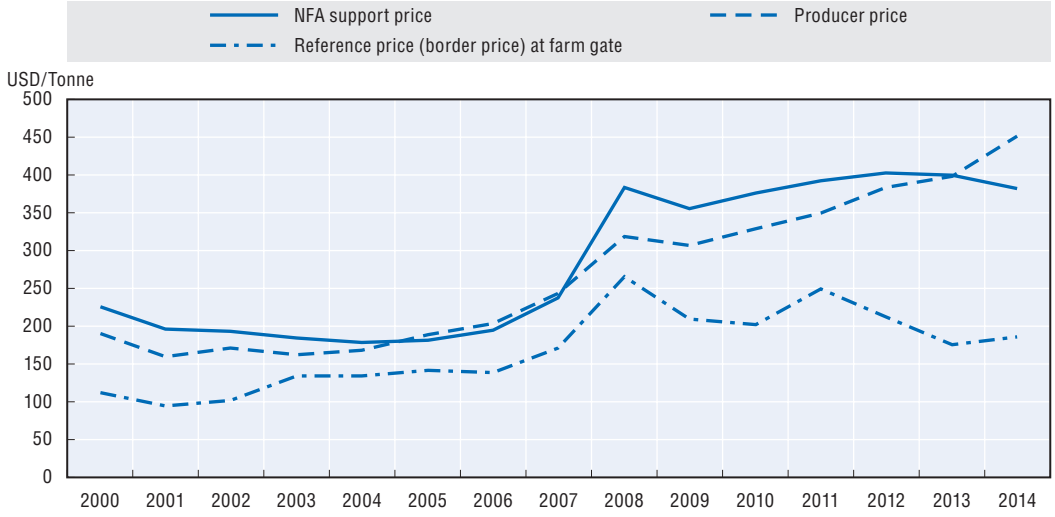
Figure 2.2. **Paddy rice procurement by NFA, 1995-2014**




*Source:* DA (2015).

StatLink http://dx.doi.org/10.1787/888933452416

Figure 2.3. **Government-set procurement price and producer price of paddy rice, 2000-14**




*Source:* DA (2015), OECD (2016), "Producer and Consumer Estimates", *OECD Agriculture Statistics Database*.

StatLink http://dx.doi.org/10.1787/888933452429

### *Sugar*

Price support and market regulation for sugar has a long history in the Philippines. The sugar trade was monopolised under the authority of the Philippine Exchange Inc. (later National Sugar Trading Corporation) in 1974. In 1985, the sugar monopoly was dismantled, government-owned sugar mills were privatised and market forces restored (FAO, 1997). The Sugar Regulatory Administration (SRA) was created in 1986. Today, sugar production, trade and domestic prices are largely governed by the SRA. The role of SRA includes developing the sugar industry (including research and development), regulating inventory levels and allocating **production quotas** (Box 2.2) (David et al., 2009).

### Box 2.2. **Sugar production quotas**

At the start of each crop year, the SRA issues a central policy (known as Sugar Order No. 1) on production and marketing of sugar, determining how much production will be allocated to the domestic and export markets, and to reserves. This order is adjusted later in the season if necessary.

Most sugar in the Philippines is produced and marketed under the *quedan* (warehouse receipt) system. After processing the sugar, the mill issues a warehouse receipt, a *quedan*, to the farmer representing farmer's 70% share of the processed sugar (Section 1.9). It can also be used in paying for the processing of the cane. The *quedan* is a negotiable instrument and the owner may use it to withdraw their stocks at any time, giving rise to a secondary market for *quedans*. Sugar farmers usually sell the *quedans* to local traders, who in turn sell them to larger traders who sell them in large quantities to wholesalers, distributors or processors who then withdraw sugar from the mills. The processors use the sugar as an input for food and beverages while the wholesalers and distributors sell their sugar to major retailers.

There are five different types of *quedans*. "A" sugar is allocated to exports to the US, the largest export market for Philippine sugar. "B" sugar is allocated to the domestic market and "B-1" sugar is for food processors. "C" sugar is categorised as reserve, and may subsequently be converted to either A or B, depending on the market situation. "D" sugar is destined for the world market.

SRA determines the allocation of sugar volumes across various types of *quedans*. Within the current production volumes, only A and B *quedans* are allocated to farmers. The volume of "A" sugar is based on the volume of the preferential tariff rate quota allocated to the Philippines by the US government and on projected volume of production in a given crop year. This is usually less than 10% of total domestic output. The rest of the output is classified as "B" sugar. For the latest crop year (2015/16) SRA allocated all sugar production for the domestic market. However, in order to fulfil the US export quota, SRA allowed a partial reallocation of "B" sugar for exports to the United States. Correspondingly, imports of the same amount of sugar from the world market were allowed to satisfy the domestic demand.

*Source:* USDA (2015).

Within its WTO commitments, the Philippines maintained import quotas and **high tariffs** on raw and refined sugar imports (in-quota tariff of 50% and out-of-quota tariff of 65%) (Table 2.A1.6). However, in 2010, in line with a commitment undertaken within the AFTA, the Philippines agreed to lower the preferential tariff on imports of sugar from AFTA countries from 38% to 5% by 2015.[8]

The Sugarcane Industry Roadmap (2011-16) aims to prepare the sugarcane industry for reduced tariffs on imported sugar and to increase the productivity of domestic sugar production. One of the proposed measures is instituting **block farming** to encourage small farms (less than 10 ha) to consolidate into minimum block farms of 30-50 ha through various schemes, such as contract growing, joint ventures, partnerships, profit-sharing and hiring of professional farm managers. The roadmap supports identification of possible expansion areas suitable for sugarcane production, research and development, building farm-to-market roads, farm mechanisation and irrigation. Implementing partners include the DA, DAR and SRA. The DAR monitors selected block farms[9], the SRA oversees programme implementation and provides technical assistance, and the DA is responsible for infrastructure investments. In addition, the Sugarcane Industry Development Act was adopted in 2015 to promote and support the competitiveness of the sugarcane industry. The government allocated PHP 2 billion (USD 44 million) for infrastructure, research and development, credit, grants to co-operative farms and scholarships to support sugar producers.

### *Reduction of input costs*

#### *Support for variable inputs*

Following a calamitous harvest in 1972[10], a number of programmes, mainly targeting rice producers, were implemented that relied heavily on **input subsidies** to increase rice production. Since then, **e**ach new presidential administration has re-issued essentially the same framework under a different name, targeting self-sufficiency and using largely the same strategy (Table 2.A1.4). In the mid-1990s, other priority crops were added and the range of supported activities was broadened. These sets of commodity-specific policy measures have been named banner programmes. They contain a uniform set of services provided to producers of a particular commodity. Their main focus is on easing farmers' access to inputs, but they also include expenditures on extension, research, irrigation, roads, and preferential credits (Box 2.3).

Box 2.3. **Banner programmes of the DA**

DA implements a considerable part of agricultural policy through commodity-specific banner programmes, which have been the core of its overall strategic policy framework over the past decades. On average, about half of the budgetary expenditure on agriculture is spent through these programmes. Of this amount, more than 60% is allocated to rice farmers.

Currently, DA implements the following commodity programmes: National Rice Program, National Corn Program, National High Value Crop Program, National Livestock Program, National Fisheries Program and National Organic Agriculture Program. These programmes contain various services:

- *Production Support Services* include mainly input support such as: distribution of seeds, planting materials, fingerlings, animals, fertilisers and other soil ameliorants.
- *Market Development Services* include events or set-ups to promote the entry, sale or consumption of agricultural products in domestic and international markets.
- *Extension Support, Education and Training Services* include training, information, advisory services, and technology demonstration.
- *Research and Development Services* include commercialisation of technologies, establishing or maintaining research facilities, funding research and development activities.
- *Irrigation Network Services* include investments in large- and small-scale irrigation projects.
- *Farm-to-Market Road Network Services* involve construction of farm-to-market roads.
- *Agricultural Machinery, Equipment and Facilities Support Services* include distribution of farm production-related machinery (tractors, harvesters), establishing production facilities, distribution of postharvest equipment and machinery (e.g. threshers, dryers), and establishment of postharvest facilities.
- *Regulatory Services* include formulation and enforcement of product standards, prevention of disease and pest infestation, quarantine and inspection, issuance of certifications, licences etc.

*Source:* DA (2015).

In the 2000s, the *Ginintuang Masaganang Ani* (Golden and Bountiful Harvest) was the main policy framework providing support to rice producers within the **rice banner programme** (Table 2.A1.4). High yielding rice varieties and fertilisers were subsidised to encourage

farmers to adopt certified inbred and hybrid seeds. Within this framework, the government launched the Hybrid Rice Commercialisation Program (HRCP) in 2001 followed by another programme applied in 2008-10, in response to the 2008 food price crisis, called Fertiliser, Irrigation and other rural infrastructure, Extension and education, Loans, Dryers and other post-harvest facilities and Seeds (FIELDS). Three elements of support were provided through the HRCP: procurement of seeds at a guaranteed price; distribution of the procured seeds to participating farmers at half the procurement price[11]; and payments to participating farmers to help cover fertiliser costs (Cororaton and Corong, 2009).

Under the HRCP, budgetary allocations on **seed subsidies** were already high, but they increased strongly under FIELDS to a point where they accounted for about 20% of its total budget.[12] In spite of sizable budgetary resources allocated to both programmes, the adoption of hybrid seeds remained low and rice yields did not increase as much as expected (Chapter 1). Following a change in leadership in the DA in 2010, such input subsidies were terminated on the basis of being too costly and ineffective (Mariano and Giesecke, 2014).

In 2011, a framework called *Agrikulturang Pilipino* or ***Agri-Pinoy*** was introduced to guide various programmes of the DA over 2011-16. *Agri-Pinoy* is based on four principles: food security and self-sufficiency, sustainable agriculture, natural resource management and local development. To achieve self-sufficiency in food staples the **Food Staples Self-Sufficiency Program** (FSSP) was launched in 2011 under the Agri-Pinoy. The aim of the FSSP 2011-16 is to secure food supply for the population while ensuring a decent and rising standard of living for farmers. Productivity growth is prioritised as the main tool to achieve self-sufficiency, especially in rice, but also in a number of other staples such as white maize, root crops (cassava and sweet potato) and *saba* bananas. As within the previous rice programmes, farmers are encouraged to use high-yielding seed varieties combined with more fertilisers and extension of irrigation systems (Sombilla and Quilloy, 2014). However, a major difference is that the free provision of seeds to farmers was discontinued and replaced by a Community Seed Bank and, later, High Yielding Technology Program that provides seeds (and fertilisers) within roll-over or conditional assistance schemes (Box 2.4).

In addition to rice, currently active banner programmes under the *Agri-Pinoy* framework include maize, high value crops, livestock and organic products (Box 2.3). To promote diversification of agricultural production, budgetary expenditures on high-value crops[13] and livestock banner programmes were substantially increased in the 2010s.

Although the provision of seed subsidies was reorganised in 2011, the government continues to regulate seed prices. The **selling and buying prices of seeds** are declared by a DA Administrative Order. The price is determined for inbred and hybrid rice seeds for different seed classes as a guide to different agencies involved in the seed programme as well as to the seed growers and farmers (Hernandez, 2013). The DA also determines seed prices for maize, vegetables, legumes and plant materials. According to Sombilla and Quilloy (2014), these prices are below the private sector competitive price and do not provide enough incentive for seed producers to enhance production.

While coconuts are not explicitly covered by banner programmes, the Philippine Coconut Authority (PCA) implements the **National Coconut Program** with two sub-programmes: the Salt Fertilisation Program and the Accelerated Coconut Planting and Replanting Project, both partly based on the provision of subsidised inputs. After 2013, when the coconut farms were severely hit by Typhoon Haiyan, funds appropriated by the government to programmes implemented by the PCA increased substantially. These programmes are targeted to improve

coconut yields and alleviate the high incidence of poverty among coconut farmers (Box 1.2). Under the Salt Fertilisation Program, coconut farmers are provided with common salt or sodium chloride to increase coconut productivity and improve resistance to pest and diseases. The Accelerated Coconut Planting and Replanting Project is composed of several components, including the Coconut Seedlings Dispersal Project and the Participatory Coconut Planting Project[14], both of which provide input subsidies to coconut farmers (PCA, 2012).

### Box 2.4. **Programmes for rice farmers under *Agri-Pinoy***

With the introduction of the FSSP the DA phased out the former rice seeds subsidy programme and replaced it with a **Community Seed Bank Program** (Ferrer, 2014). The new programme is intended for farmers who cannot afford to buy quality seeds or have difficulty accessing them. It also aims to maintain a **buffer stock of seeds** equivalent to 10% of planting requirement in the wet season and 5% in dry season to ensure availability during calamities and crop failure. Community Seed Banks are managed by the Irrigators Associations (IAs), FOs and non-government organisations. The programme encourages organised farmer groups and co-operatives to produce their own certified or inbred rice seeds out of the registered rice seeds distributed to them for free. The DA distributes an initial starter of at least 20 kg of registered seeds to qualified farmer groups, co-operatives and IAs for this purpose. Farmers benefiting from the seeds are required to pay back in-kind to the community seed bank, to maintain a buffer stock of seeds. Farmers may choose to pay back the borrowed seeds in the form of 1.5 kg of clean and dry seeds per kilogram of borrowed seeds if payment is outright; or 2 kg if after the harvest. The seeds produced by farmers out of the initial amount of seeds distributed by the DA are expected to be used for at least four cropping seasons. After that, the DA will provide another set of registered seeds. Under the programme, the government also supports the repair of existing storage facilities and warehouses managed by farmer groups (DA, 2011).

In 2015, the government introduced a **High Yielding Technology Adoption Program**, a sub-programme of the DA's National Rice Programme implemented by the DA's Regional Field Offices, to support the adoption of high yielding rice varieties (hybrid, certified inbreed seeds and Green Super Rice) in more than 560 000 hectares. DA Regional Offices will be in charge of distributing the seeds to farmer groups, along with fertilisers and soil ameliorants under a **roll-over or conditional assistance schemes**. In order to guarantee the repayment of inputs given to farmers or increase yields resulting from the distributed seeds, Regional Offices may design reward systems. Farmers who achieve excellent results under the programme will be rewarded with hand tractors with trailers, four-wheel drive tractors, threshers, water pumps, warehouses, combine harvesters and dryers (DA website, 2015).

#### *Support for fixed inputs*

The level of farm mechanisation in the Philippines is relatively low (Chapter 1). Under the FSSP rice self-sufficiency strategy, the government launched the **Rice Mechanization Program** in 2011, with the aim of improving production operations and reducing national average post-harvest losses by at least 5% by end-2016. The programme is aimed at facilitating rice farmers' access to appropriate production and post-production systems as well as to increase their income by at least 15% as a result of more efficient production, drying and milling operations. The programme has on-farm and off-farm components. On-farm components include the provision of farm mechanisation facilities and equipment to FOs. An off-farm mechanisation programme is intended to improve drying capabilities of FOs and enhance the modernisation of the rice milling industry in the Philippines.

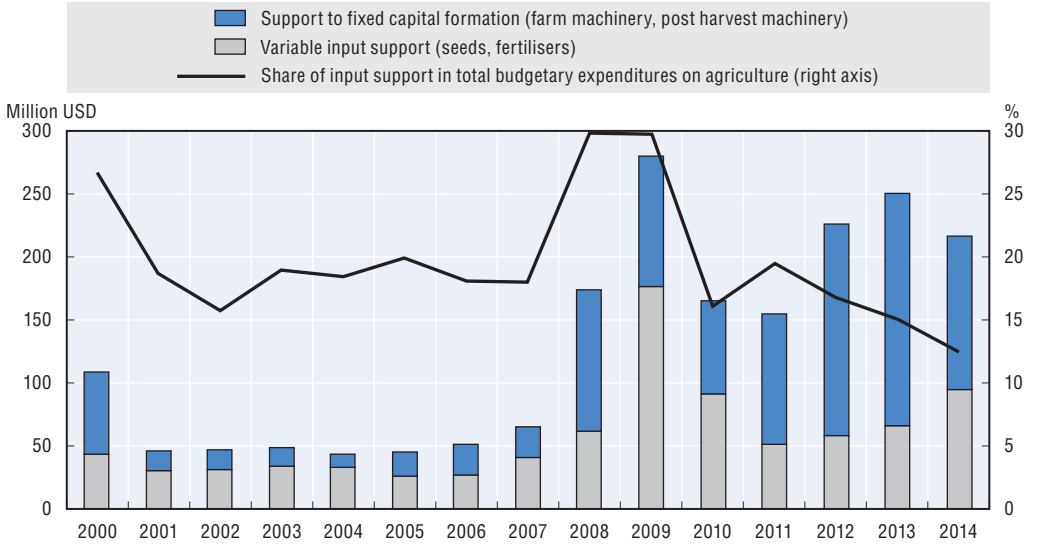
For the on-farm component, the government covers 85% of the cost of farm machinery to qualified farmer organisations, while the remaining 15% is paid by farmer groups. The main items provided under the programme are: mechanical dryers, hand tractors, four-wheel tractors, paddy rice threshers, rice drum seeders, rice cutters and rice combine harvesters. Farmer associations act as service providers: they deliver on-farm operations like irrigation, land preparation, seeding, harvesting and threshing to the small farmers, co-operatives and FOs at a reasonable fee. **Budgetary expenditures** for the Rice Mechanisation Program amounted to PHP 16 billion (USD 369 million) for 2011-16. By 2016, the programme aims to procure and distribute 7 000 postharvest units and 90 000 units of on-farm machinery (Tobias et al., 2012).

In 2013, the Agricultural and Fisheries Mechanization (AFMech) Law was adopted[15] to improve farm mechanisation and contribute to the country's food sufficiency goals. A five-year National Agri-Fishery Mechanization Program will be implemented over 2016-22 to improve the level of farm mechanisation. The Philippine Center for Postharvest Development and Mechanization (PhilMech) was assigned to set technical standards to help manufacturers provide the appropriate products to farmers.

### *Budgetary support for input subsidies*

Until 2008, the **budgetary spending** on input support programmes, both variable and fixed, was stable at around PHP 2.5 billion annually (USD 50 million), although the names of the programmes changed frequently (Figure 2.4, Table 2.A1.4). There was a sharp increase in public expenditures on input subsidies in 2009, as a response to the food price crisis in 2008, to encourage rice productivity (FIELDS programme). In absolute terms, expenditure fell in succeeding years but began to increase again in 2012, focusing mainly on support to farm and postharvest machinery. However, a relative decline in importance of subsidies provided to variable and fixed inputs has been noticeable, from an average of 30% of total budgetary support to agriculture in 2009 to 12-15% in 2013-14 (Figure 2.4). This is a positive trend as input subsidies are considered as one of the least effective ways of supporting farmer incomes, and the decline allows the reallocation of these expenditures to other, more effective ways of supporting agricultural productivity in the longer term, such as infrastructure (Section 2.5).

Figure 2.4. **Budgetary expenditures for input subsidies, 2000-14**




*Source:* OECD (2016), "Producer and Consumer Estimates", *OECD Agriculture Statistics Database*, DA (2015).

StatLink http://dx.doi.org/10.1787/888933452432

### *Irrigation*

Historically, irrigation has been a major factor in increasing rice productivity in the Philippines. The National Irrigation Administration (NIA), a GOCC, is responsible for irrigation development and management. The major principle governing the development of irrigation systems in the Philippines is the **Participatory Approach Program**, which enables all farmers to be involved in the process of irrigation development and management (planning, designing, construction and operation). The participatory approach was initiated in the 1970s with the goal of eventually turning operation and maintenance (O&M) responsibilities over to farmer groups (Ofrecio, 2006). In order to participate in irrigation development, farmers are organised to formal groups called Irrigator Associations (IA).

Total potentially **irrigable land** in the Philippines amounts to 3 million ha, of which 1.7 million ha (57%) have been covered by irrigation facilities (NIA, 2015a). There are three basic types of irrigation systems in the Philippines:

- **National Irrigation Systems** (NIS) are large, with a service area of 1 000 ha or more. They are owned by the government through the NIA, but jointly managed with the IAs (Box 2.5). Farmers have to pay a per-hectare Irrigation Service Fee for the delivery of water. The NIA operates 285 such systems with a total service area of 755 000 ha, covering 44% of total irrigated area in 2015 (OPAFSAM, 2016).
- **Communal Irrigation Systems** (CIS) are smaller, with a service area less than 1 000 ha. In 1991, the development and management of CIS was transferred from the national government to LGUs. CIS are farmer-owned (through IAs), but the government assists in their planning and construction. IAs contribute about 10% of construction costs and amortise the remaining costs financed by the government for a period not exceeding 50 years at a 0% interest rate. The repayment scheme is pre-arranged and has to be accepted both by the NIA and IAs. Operation and maintenance of CIS is fully handed over to the concerned IAs. In 2015, 8 990 CIS operated on 616 000 ha, 36% of total irrigated area (OPAFSAM, 2016).
- **Private Irrigation Systems** are owned by private individuals or corporations. They are established by individual farmers or small groups of farmers at their own initiative and effort. They are constructed without government's assistance and are managed independently (Labiano, 2014). Their total number is large at 16 675, but their importance is relatively small in terms of area coverage as they operated on 188 000 ha in 2015, 11% of total irrigated area (NIA, 2015a).[16]

Various studies have shown that the performance of the NIS has been much weaker than expected; operation and maintenance fails to distribute water efficiently and equitably and irrigation systems are deteriorating rapidly (David et al., 2012). Reasons for the **underperformance of irrigation systems** could include: overoptimistic assumptions in developing the service areas, which tend to be larger than the available water resources; inadequate operation and maintenance; limited farmer participation; and deterioration of existing systems, mainly due to natural calamities (Delmo, 2013).

**Budgetary expenditures** on irrigation have accounted, on average, for about 36% of annual budgetary spending on agriculture (Figure 2.5). Nearly all of the budgetary allocations are spent on gravity systems suitable mainly for rice production. Up to the mid-1980s, 95% of irrigation investments were spent for NIS, with CIS at only 5%. In the mid-1990s the share of CIS in total irrigation investments had increased to more than 40% as a result of the government's decision to allocate resources to CIS from the

Agrarian Reform Fund of the CARP. By the late 1990s, however, irrigation investments again began to focus on NIS, with 90% of the NIA's budget allocated to NIS in 2007-08 (David et al., 2012).

### Box 2.5. **Management of National Irrigation Systems**

Government policy is to cover the construction costs of irrigation projects[1], but farmers who are in the service area of the NIS have to pay the Irrigation Service Fee (ISF). The ISF is collected by NIA to generate revenues sufficient to cover operation and maintenance costs (NIA, 2015b).[2] The rate of ISF depends on the type of irrigation system (run-off-the-river, reservoir and pump), crops planted, and season. These are denominated in kind: in cavans (1 cavan = 50 kg) of paddy rice per hectare; however, cash payments are encouraged. Rates for pump systems are higher as the cost of power for pump operation is included and vary across systems as power rates are location-specific. Farms with a rice yield of 40 cavans per hectare or below are exempted from ISF payment (NIA, 2015b). In 2012, the ISF per hectare was 150 kg of rice or PHP 2 250 (USD 53) in the dry season and 100 kg of rice or PHP 1 500 (USD 35) in the wet season (Stoutjesdijk, 2012). The ISF makes up more than half of the NIA's revenues; however, it does not cover capital costs nor the full cost of operation and maintenance. The ISF average collection rate was 63-67% over 2013-15 (OPAFSAM, 2016).

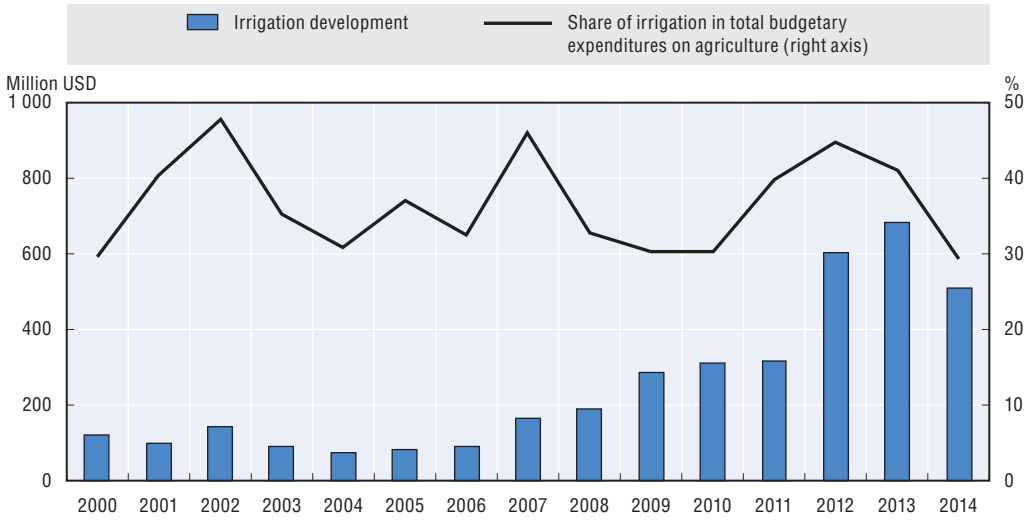
The Irrigation Management Transfer programme, dating from the end of the 1990s, was implemented to strengthen the participatory approach system. The NIA and IAs agree on "joint system management" whereby the responsibilities for the operation, management, and repair of damaged systems are defined in a contract. While in the past, the collection and division of the ISF was negotiated and usually split 50:50, the new system aims to increase the role of IAs relative to the NIA. The programme was expected to decrease the operation and management expenditures of the government, encourage users and increase their satisfaction through beneficiary participation, increase water use efficiency and increase productivity (Ofrecio, 2006). IAs can choose among four models when entering into an Irrigation Management Transfer contract, varying according to the extent of management and O&M responsibilities transferred to the IA (OPAFSAM, 2016):

- Model 1: NIA continues to manage the entire irrigation system, but transfers specific O&M activities to the IA, such as canal maintenance and discharge monitoring. ISF collection may be an added responsibility depending on capacity and willingness of the IA.
- Model 2: NIA manages the main system, but transfers the management of the laterals, sub-laterals, and lateral facilities to the IA.
- Model 3: NIA manages the headworks and portion of the main canal up to the junction of the first lateral canals, and transfers the management of all remaining canals and facilities to the IA.
- Model 4: NIA transfers the management of the entire system to the IA.

At the end of 2015, Model 2 was most popular accounting for 49% of IAs followed by Model 1 with 46%. Models 3 and 4 accounted for just 3% and 2%, respectively (OPAFSAM, 2016).

1. NEDA Resolution No. 20, series of 1978.
2. Operation and maintenance include operation of storage and diversion dams; running of pumps; operation of gates, turnouts and drainage ditches; preparation and implementation of cropping and irrigation schedules; maintenance of the physical facilities including service and access roads, and repairs on minor damages caused by floods and typhoons (NIA, 2013).

Figure 2.5. **Budgetary expenditures on irrigation, 2000-14**




*Source:* OECD (2016), "Producer and Consumer Estimates", *OECD Agriculture Statistics Database*.

StatLink http://dx.doi.org/10.1787/888933452441

### *Credit policies for farmers*

Credit policies for the agricultural sector have changed significantly during the past few decades. Up until the mid-1980s, credit policy was supply-led, commodity-specific and used as a major instrument for agricultural development. Loans were highly subsidised and interest rates were set by the government. During this period, the number of commodity-specific **directed credit programs** (DCPs) increased rapidly and non-financial government agencies, including the DA, undertook direct lending (DA, 2015).

Financial reforms initiated in the mid-1980s to liberalise and deregulate financial markets were unsuccessful. One reason was that, although subsidised credit programmes were terminated for agriculture, they continued in non-agricultural sectors, leading to successful lobbying for restoration of subsidised credit for agriculture. By 1999, there were 86 government credit programmes implemented by 21 government agencies (DA, 2015). The programmes had low outreach, suffered from poor management and large defaults; financially unsustainable, they led to large fiscal losses. These developments undermined the government's market-oriented credit and financial policy as well as the viability of formal rural financial markets (Geron and Casuga, 2012).

### *Agriculture Modernisation Credit and Financing Program*

Another effort to introduce a market-oriented financial system in agriculture was undertaken in the mid-1990s. AFMA served as the basis of the reform. Its credit policy lays down core principles: a greater role for private sector; non-participation of government non-financial agencies; market-determined interest rates; and sustaining efforts to phase out DCPs.

The current framework is still based on AFMA. The main role of the government is to provide an enabling policy environment and support services that encourage lending and investment to agriculture by the private sector. The government's non-financial institutions are no longer allowed to lend directly to farmers; along with private banks, only government financial institutions, such as the LBP, are allowed to lend directly to farmers. Agricultural

DCPs were terminated and their remaining loanable funds and receivables were consolidated into the **AMCFP** (Agro-industry Modernisation Credit and Financing Program). Interest rates are market-determined to ensure recovery of lending costs and sustainability of credit funds. Interest rate concessions and subsidies are not allowed (DA, 2015).

In addition to AFMA, agricultural credit policy is influenced by: the National Strategy for Microfinance (1997), Social Reform and Poverty Alleviation Act (1997); Executive Order 138 (1999), which directed government agencies to implement credit programmes and to adopt the National Credit Council's Credit Policy Guidelines[17]; and the General Banking Act (2000). In 2009, the Agri-Agra Reform Credit Act (RA 10000) stipulated that all banking institutions (government and private) must set aside at least 25% of their total loanable funds to agricultural credit, and at least 10% of this for agrarian reform beneficiaries (Aquino et al., 2014).

The AMCFP, which came into effect in 2003, is a key financing and credit guarantee programme for small-scale farmers. Loans are provided to activities within the agricultural value chain: production, processing, trading and marketing (WTO, 2012). The ACPC has administered the AMCFP since 2009.

There are two modes of credit delivery under AMCFP:

- **Wholesaler-retailer approach**: ACPC partners with government's financing institutions and other financing institutions serve as AMCFP wholesalers. Wholesalers lend to rural-based credit retailers composed of qualified private banks, farmers' co-operatives and non-government organisations. Retailers grant loans to eligible small farmers.
- **Depository scheme**: credit funds are placed as special time deposits in partner co-operative banks, eliminating the need for a wholesaler and reducing interest rates for small farmers (NEDA, 2014b).

Initially, the AMCFP was financed from loan repayments of terminated directed credit programs (DCPs) that were consolidated to AMCFP. In 2013, the government allocated PHP 1 billion (USD 23.6 million) to AMCFP to implement the Agriculture and Fisheries Financing Program (AFFP). In 2015, an additional PHP 2 billion (USD 44.4 million) was granted to AMCFP. Between 2003 and 31 May 2015, credit programmes under the AMCFP had released more than PHP 8.0 billion (USD 168 million) in loans to 232 371 small farmers. Loans are provided through the LBP, the Peoples Credit and Finance Corporation (PCFC) and accredited co-operative banks (DA, 2015).

Currently, the AMCFP includes the following credit programmes: the Cooperative Banks Agricultural Lending Program; the *Sikat-Saka* Program; the Agricultural Microfinance Program; the Agri-Fisheries Financing Program; and the Calamity Assistance Program (Table 2.2, Box 2.6) (DA, 2015).

### *Agricultural Competitiveness Enhancement Fund*

The **Agricultural Competitiveness Enhancement Fund** (ACEF) is a loan and grant programme created by the Agricultural Tariffication Act (RA 8178) in 1995 as a safety net for farmers and fishermen affected by trade liberalisation. ACEF is funded by import tariff revenues from the minimum access volume (MAV) of sensitive agricultural products, except rice. However, due to the lack of guidelines it was implemented only from 2000 (Israel, 2012). The Fund was supposed to expire in 2007, but this date has been changed several times and is currently 2020.

Table 2.2. **AMCFP amount of loan releases, 2003-15, USD million**

| | 2003-07 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 (Jan-May) | Cumulative (2003-15) |
|---|---|---|---|---|---|---|---|---|---|---|
| **On-Going Programmes** | **0** | **0** | **1** | **3** | **9** | **26** | **55** | **141** | **19** | **255** |
| Cooperative Banks Agricultural Lending Program[1] | | | | | 5 | 22 | 16 | 20 | 3 | 65 |
| Agricultural Microfinance Program[1] | | | 1 | 3 | 5 | 3 | 3 | 2 | 0 | 18 |
| Sikat-Saka Program[1] | | | | | | 1 | 7 | 20 | 6 | 34 |
| Calamity Assistance Program[1] | | | | | | | 1 | 2 | 0 | 3 |
| Agri Fishery Financing Program | | | | | | | | 1 | 2 | 3 |
| **Completed/Terminated Programmes** | **20** | **20** | **12** | **11** | **1** | **0** | **0** | **0** | | **56** |
| Cooperative Bank Agriculture Lending Program[2] | | 10 | 11 | 10 | | | | | | 31 |
| Cooperatives Agricultural Lending Program | | | | | | 0 | | | | 0 |
| Agri-Fishery and Microfinance Program | | 0 | 0 | 0 | 0 | | | | | 1 |
| Fisheries Financing Program | | | 0 | | 0 | | | | | 0 |
| AMCFP-Tomato | | 1 | 1 | 1 | 1 | | | | | 3 |
| AMCFP-Tobacco | | 1 | 1 | | | | | | | 1 |
| QuedanCor Lending Windows (Countryside Lending, Corn and Fishery Program, Micro-Credit, Tomato Program and Tobacco Program)[3] | 14 | | | | | | | | | 14 |
| Rural Household Business Financing Program | 1 | 0 | | | | | | | | 2 |
| Special Agricultural Financing Window[4] | 4 | | | | | | | | | 4 |
| **TOTAL** | **20** | **20** | **14** | **14** | **10** | **26** | **55** | **141** | **19** | **311** |

*Note*: Releases in AMCFP started in 2003.
1. AMCFP lending facilities (loanable funds sourced from collection under DCPs).
2. Effective 30 June 2010, the wholesaler-retailer mode of credit delivery was replaced by a depository mode scheme.
3. Programme ended in 2007.
4. Starting 2005, it has been implemented under the regular lending window of the LBP.
*Source:* DA (2015), *ACPC database*.

## Box 2.6. **Credit programmes under the Agriculture Modernisation Credit and Financing Program**

The aim of the **Cooperative Banks Agricultural Lending Program** is to provide funding support to co-operative banks that lend to small farmers in the form of short-term deposit placements (special time deposits). Banks in turn use the proceeds of these and their own funds to lend to individual small farmers. Eligible end-borrowers are farms of not more than 7 hectares, or backyard poultry or livestock raisers or agricultural workers. Loans are provided for crop, livestock or high-value crop production as well as for off-farm activities of agricultural households. The programme is to be implemented in 2011-16 at a total cost of PHP 400 million (USD 9 million).

The ***Sikat-Saka* Program** is a credit support programme of the DA's FSSP which provides loans at a lower interest rate (maximum of 15% per annum) to small paddy rice farmers through irrigator associations (IAs). The programme is jointly implemented by the LBP and the DA's attached agencies and corporations, namely: (i) the ACPC, which provides credit funds and conducts programme evaluations; (ii) the Agriculture Training Institute (ATI), which provides extension services and training for farmers; (iii) the NFA as one of the purchasers of farmers' produce; and (iv) the National Irrigation Administration (NIA), which mobilises and assists IAs in becoming credit consolidators. Only new borrowers and small paddy rice farmers who own 1-5 ha of irrigated land are eligible for loans under this programme. Farmers are required to have bank account with LBP and a marketing contract with the NFA or other buyers. Loans are based on the farm budget estimate, but cannot exceed the LBP loan ceiling of PHP 37 000 (USD 876) for inbred varieties and PHP 42 000 (USD 995) for hybrid varieties. Farmers are provided crop insurance at full premium support and credits are provided with a guarantee of 85% under the Agricultural Guarantee Fund Pool (AGFP) Program. The total cost of the project is PHP 400 million (USD 9 million), shared by the ACPC and the LBP. Programme implementation is foreseen for 2012-17.

### Box 2.6. **Credit programmes under the Agriculture Modernisation Credit and Financing Program** *(cont.)*

The **Agricultural Microfinance Program** for small farming households was launched in 2009 as AMCFP's microfinance facility for agriculture, providing short-term loans for income-generating livelihood activities on-farm, off-farm and for non-farm rural households. The aim is to contribute to poverty reduction and improve the quality of life of marginalised farmers through the provision of microloans for agricultural value chain activities (e.g. production, processing and marketing of agricultural commodities) and other income generating activities of agricultural households such as *sari-sari* (convenience) stores, ambulant vending, backyard poultry or livestock rising. Credit is provided according to the wholesaler-retailer approach by the People's Credit and Finance Corporation (PCFC) to microfinance institutions under a credit fund and sharing arrangement with ACPC. Eligible end-borrowers are spouses, household heads or adult working members of small farmer households with at least a one-year track record as microfinance sub-borrowers. Eligible projects include new farm, off-farm, non-farm income generating activities and rehabilitation of agricultural projects damaged by El Niño and other natural calamities. Loans are limited to PHP 150 000 (USD 3 463) per borrower.

The **Agri-Fishery Financing Program** is a flexible credit facility targeted to non-ARB (agrarian reform beneficiaries) small farmers registered in the Registry System for Basic Sectors in Agriculture (RSBSA). RSBSA farmers are provided crop insurance at full premium subsidy. The aim is to contribute to inclusive growth through financial inclusion of sectors in agriculture that are unbanked or underbanked. There are two schemes. Under the first, LBP provides loans directly to small farmers. FOs are responsible for identifying individual borrowers. Under the second, PCFC provides wholesale loans to accredited microfinance institutions, like rural banks, co-operatives and NGOs that in turn relend to small farmers. Loans under the LBP facility are intended for the production of priority agricultural commodities including coconut, maize, livestock and high-value crops. Loans under PCFC facility are intended for agri-microfinance and loans. The total cost of the project is PHP 1 billion (USD 22 million); the implementation period is 2014-19.

The **Calamity Assistance Program** provides financing to supplement existing resources of the DA and the ACPC in providing calamity loan assistance to farmer families in typhoon-affected areas for the rehabilitation of their livelihoods. The ACPC provides zero-cost interest rate to eligible conduits under a fund management arrangement. In turn, these disburse loan funds to affected families at 0% interest. Eligible end-borrowers are small farmers or their household members who are existing borrowers of the DA or ACPC. Cooperative banks act as credit retailers that utilise the special time deposits from the programme and their equivalent own funds to increase their loans to eligible small farmers' households. The total cost of the project is PHP 131 million (USD 3 million) and the implementation period is from 2013 to 2018.

*Source*: DA (2015).

The ACEF targets farmers, small- and medium-size enterprises, co-operatives, LGUs, and state universities. Its main objective is to increase the productivity of farmers and cut their costs through loans aimed at income generating and competitiveness enhancing projects. Since 2008, the Fund has provided grants without any collateral or security to LGUs, state universities and colleges, or other government institutions involved in the research and development of agricultural products. The Fund's initial budget allocations were focused on loans to agricultural production and processing (70% of total), followed by research and development (20%), and scholarship programmes for agriculture, forestry, fisheries and veterinary medicine (10%) (Israel, 2012).

Operations of the fund were suspended in 2011 due to problems concerning management and misuse of funds as well as low repayment (Israel, 2012). The **average repayment rate** in 2009 was as low as 21%. The moratorium on operations was lifted a year later with

PHP 1.9 billion (USD 42 million) allocated to the Fund. In 2016, new guidelines were agreed: the share of credit was increased to 80% of the fund for the acquisition of agricultural production and post-production machinery, equipment and establishment of facilities. LBP is responsible for managing the credits. The remaining 20% will be equally divided between grants for research and development of agricultural products and grants for agricultural education.

### *Debt restructuring and write off*

**Debt write-offs** are not allowed for loans from government funds subject to state audit. Restructuring of the loans of ACPC's partner financing institutions may be granted, provided that reasons for non-repayment are due to natural disasters or calamities (DA, 2015).

The ACPC is still collecting loan receivables from DCPs that form part of the AMCFP funds. In 2015, loan receivables including past due loans from terminated DCPs amounted to PHP 6.35 billion (USD 141 million). Of this amount, ACPC has already collected PHP 1.68 billion (USD 37 million) (26%), leaving PHP 4.67 billion (USD 104 million) to be collected. About PHP 4.1 billion (USD 91 million) is considered to be non-performing loans, i.e. receivables aging five years and above (DA, 2015).

### *Credit guarantee*

Currently, the credit guarantee programme for the agricultural sector is the **Agricultural Guarantee Fund Pool** (AGFP) of the DA. The AGFP was established in May 2008 to facilitate the provision of credit in agriculture by mitigating the risks involved in lending to the sector. The AGFP started operations in August 2008 with seed funding of PHP 4.48 billion (USD 101 million) drawn from government revenues and surplus funds of GOCCs and finance institutions. The objective is to encourage banks, co-operatives and other lending institutions to increase their loans to small agricultural borrowers, particularly new borrowers, or expand their lending to existing borrowers. This is also expected to enhance food production activities by lowering the lenders' risks in agricultural non-collateralised lending (DA, 2015).

The AGFP provides guarantee cover up to 85% of unsecured loans provided by financial institutions and other eligible lenders to small farmer borrowers engaged in rice or other food production activities. The AGFP guarantee covers all types of default risks, including weather, pest and diseases and other events, except wilful default and fraud. In case of default or non-repayment for any of the valid reasons, the AGFP shall pay the lending institution 85% of the unpaid loan and the participating lender must pay a guarantee fee of 2% per annum of the outstanding loan amount. Collection of unpaid loans, even if already paid by the guarantee programme, remains the responsibility of the financial institution. By end-December 2014, 653 lenders composed of banks, co-operatives, SMEs and FOs had benefited from the guarantee coverage for loans of 609 689 farmers amounting to almost PHP 25 billion (USD 563 million) (DA, 2015).

### *Quedan guarantee system*

The **Quedan Guarantee Fund Board** (QGFB) was created in 1978 to accelerate the flow of investments and credit resources into the countryside through the various *quedan* credit and guarantee programmes. When the *quedan* guarantee system started, surpluses in rice production were occurring due to the successful implementation of the *Masagana* 99 programme. During peak harvest, the paddy rice price is at its lowest, and this affects

the income of marginalised farmers. To help them wait for prices to go up and still be able to finance the new cropping season, the *quedan* guarantee system was set up. When the farm gate price is at its lowest, a farmer stores his or her produce in a NFA warehouse and gets a corresponding *quedan* receipt from the warehouse owner as evidence of his or her stored commodity.

Using the warehouse receipt ***quedan* as collateral**, the farmers can apply for a loan from QGFB accredited banks to finance a new planting season. When paddy rice prices go up, the farmers can sell their stored commodity, realise a better income and pay their loan back to the bank. The guarantee system later expanded to other commodities and consequently, additional programmes were created to fit the agency's services to the changing needs of people in the agricultural sector.

The successful implementation of the *quedan* system through the QGFB encouraged the government to expand the agency into a corporation with wider authority and expanded resources. In 1992, the QGFB was reorganised into **QuedanCor**, of which the government owns 60% and farmers and private investors the remaining 40%. QuedanCor introduced its agri-credit and guarantee programmes and services on a national level, through the creation of Regional Offices located in strategic locations across the Philippines. As at 2016, QuedanCor had 14 Regional Offices. Currently, QuedanCor is implementing the QuedanCor agricultural credit guarantee for rural productivity, agriculture and livelihood projects. This is a guarantee-financing programme that supports the marketing of various agricultural commodities by extending credit-guarantee assistance to farmers and entrepreneurs.

### *Agricultural insurance system*

Agricultural insurance in the Philippines has two objectives: as a safety net for farmers (Section 3.3) and a credit risk management tool. Insurance is accepted as 'surrogate' collateral to financial institutions that allows farmers to participate in government credit programmes. Agricultural insurance is a regular component of credit programmes under the AMCFP (DA, 2015). The Philippine Crop Insurance Corporation (PCIC) is a GOCC responsible for implementing government insurance programmes.

Agricultural insurance programmes in the Philippines are divided into **regular and special insurance programmes**. Under the regular programmes, a farmer pays the full amount of an insurance premium. Special insurance programmes are fully subsidised by the government (Box 2.7).

Over recent years the PCIC has developed **index-based crop insurance schemes** (Box 3.4) in collaboration with bilateral development agencies, particularly the United Nations Development Program (UNDP), the World Bank (WB) and the German Corporation for International Cooperation (Deutsche Gesellschaft für Internationale Zusammenarbeit, GIZ). In 2011, Area-Based Yield Index Insurance was launched and Weather Index Based Crop Insurance (with support from the WB) started in 2014. In these insurance schemes, claims are filed and indemnities are paid based on agreed weather indices or yield threshold, rather than on actual damage suffered by producers. The PCIC is set to introduce these products on a broader scale in the coming years (DA, 2015).

The **total crop area insured** increased continuously in the period 2005-14, as shown in Figure 2.6, amounting to 792 200 ha in 2014, almost 12 times higher than the 68 600 ha covered in 2005 but only 7% of total agricultural land. Correspondingly, the number of

farmers provided with insurance protection increased seventeen-fold from 53 883 in 2005 to 917 814 in 2014. Government budgetary expenditure on insurance programmes has also been increasing rapidly: total government expenditure allocated to insurance was PHP 1.2 billion (USD 27 million) in 2014 compared to PHP 57 million in 2005 (USD 1 million) (DA, 2016).

### Box 2.7. **Regular and special insurance programmes**

The following **regular programmes** are implemented by PCIC:

- For farmers producing rice, maize and high-value commercial crops, insurance protection is provided against losses in crops due to natural disasters, plant pests and diseases.
- Insurance to livestock farmers covers protection against loss of their animals to accidental death or disease.
- Insurance of non-crop agricultural assets provides protection against loss of assets like warehouses, rice mills, irrigation facilities and other farm equipment due to fire and lightning. Related perils such as typhoon, flood and earthquake may also be covered, subject to approval by PCIC Head Office.

In addition, there are three schemes of credit and life insurance:

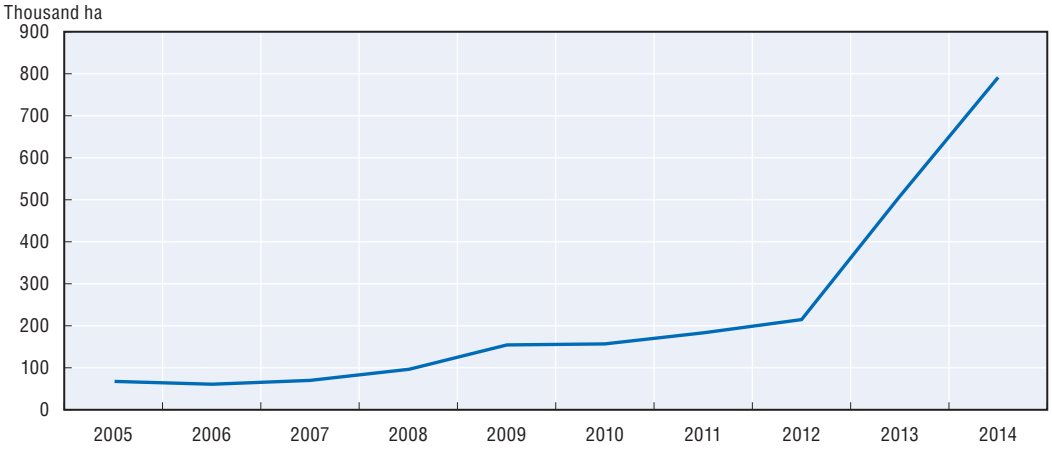
- Agricultural Producers Protection Plan: insurance protection that covers death of the insured due to accident, natural causes, and murder or assault.
- Loan Repayment Protection Plan: insurance protection that guarantees the payment of the face-value or the amount of the approved agricultural loan upon the death or total permanent disability of the insured borrower.
- Accident and Dismemberment Security Scheme: insurance protection that covers death or dismemberment of the insured due to accident (DA, 2015).

**Special agricultural insurance programmes** implemented by PCIC are:

- Agricultural Insurance Program for subsistence farmers registered in the Registry System for Basic Sectors in Agriculture (RSBSA). Under the General Appropriation Act of 2015, the government provided PHP 1.3 billion (USD 28 million) for PCIC to be used for Government Premium Subsidy (GPS). This GPS is used to cover the full cost of insurance premiums (100%) of subsistence farmers registered in the RSBSA for insuring crops (rice, corn, high value crops), livestock, fisheries or non-crop agricultural assets.
- Agricultural Insurance Program for subsistence farmers located in the Typhoon Haiyan affected areas. The PCIC provided subsidised insurance premiums for the insurance coverage of farm investments of subsistence farmers in the provinces of Western Visayas, Eastern Visayas and in municipalities in the northern part of Cebu that were directly affected by Typhoon Haiyan in November 2013.
- Agricultural Insurance Programs for agrarian reform beneficiaries (ARBs). Since June 2013, PCIC has been providing subsidised insurance premiums to ARBs, who have received agricultural loans from the Agrarian Production Credit Program (APCP) and Credit Assistance Program for Program Beneficiaries Development of the DA, DAR, and LBP.
- Sikat-Saka provides insurance protection to rice farmers who qualify for a production loan under the direct lending facility of the LBP. The PCIC has provided subsidised insurance premiums to Irrigator Associations who received loans under the LBP's *Sikat-Saka* programme since 2012.
- The WARA programme provides support to rice farmers who plant in weather adverse rice areas (WARA). Support is provided through the Food Staple Sufficiency Program of the DA since 2013, which covers the full cost of the insurance premium (100%) for rice planted in weather adverse rice areas.

*Source*: DA (2015).

Figure 2.6. **Area covered by insurance programmes, 2005-14**




*Source:* DA (2016).

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### *Preferential tax policies for farmers*

In 1997, AFMA[18] introduced an exemption from the payment of **import duties** for agricultural enterprises on all types of imported agricultural inputs, equipment and machinery, provided that the imported agricultural input or equipment was for the exclusive use of the importing enterprise. The exemption included fertilisers, insecticides, tractors, hybrid seeds, farm implements and machinery, packaging machinery and materials. Initially planned to last until 8 February 2003, in 2004, the duty-free privilege was extended until 31 December 2015.[19] By end-2016 no legislation had been enacted to extend this privilege.

Domestic sale or imports of unprocessed agricultural commodities are exempt from the **value-added tax** of 12% (WTO, 2012). Sales and importation of fertilisers are also exempted from the national VAT, but other chemicals for agricultural use, like pesticides, are not.[20] Food processors must pay VAT when purchasing agricultural products as inputs as well as on the value added in processing, with potentially adverse impacts on their competitiveness.

In 2010, the Organic Agriculture Act (RA 10068) exempted organic farmers from **income tax** for seven years starting from the date of registration for organic food and organic inputs or produce (WTO, 2012).

### *Agro-environmental policy measures*

Environmental concerns arise from the inappropriate use of modern farm techniques, deforestation, conversion of prime agricultural lands and cultivation of marginal upland areas (Briones, 2005). The main laws focusing on policies to improve land resources are the Ecological Solid Waste Management Act (RA 9003), the Organic Agriculture Act (RA 10068) and Strategic Agricultural and Fisheries Development Zones under AFMA. The Climate Change Act was adopted in 2009 (RA 9729) (Chapter 3). DA implements a number of measures to mitigate the adverse environmental impacts of agriculture and to protect production.

Developing the **organic food sector** in the Philippines is seen as a potential path to enhance high-value agricultural exports. The Philippine Organic Agriculture Act, signed in 2010, is geared towards ecologically sustainable, environmentally friendly and safer

production systems, and aims to expand the availability of safer and more nutritious staple foods and to increase farm productivity and income opportunities for farmers (DA, 2015). In 2011, new rules and regulations obliged the DA to direct 2% of its annual expenditure towards supporting policies and programmes to promote organic agriculture (Oxford Business Group, 2012). The National Organic Agriculture Program of 2012-16, implemented by the DA's Bureau of Soils and Water Management (BSWM), envisages that at least 5% of Philippine agricultural farm areas will practice organic farming by 2016 (DA, 2015).

**Sustainable Corn Production on Sloping Areas** is targeted under the DA's *Agri-Pinoy* Program. It aims to educate farmers on appropriate ways of tilling maize-planted sloped lands by practicing contour farming and planting permanent trees and leguminous plants. The DA is also encouraging farmers to stop the indiscriminate use of glyphosate herbicide on lands that slope greater than 18 degrees. By 2014, a total of 6 technology demonstration sites had been established located in CAR, Cayagan Valley, Calabarzon and Mimaropa and Western Visayas (DA, 2015).

The DA is responsible for formulating guidelines for the **re-use of wastewater for irrigation** and other agricultural uses and for the prevention, control and abatement of pollution from agricultural and aquaculture activities. The policy states that the re-use of wastewater for irrigation, fertilisation, and aquaculture, and other agricultural purposes shall require a certification from the DA. The law requests monitoring to determine the impact of wastewater use on surface and ground waters and the responses of plants to the results of the analysis (DA, 2015).

### *General services*

#### *Farm-to-market roads*

AFMA mandated the construction and upgrading of **farm-to-market roads** (FMRs) as a priority infrastructure intervention due to their significant impact on increasing agricultural productivity and reducing postharvest losses. The DA is responsible for co-ordinating with LGUs and resident farmers to identify priority locations for FMRs, taking into account the number of farmers and their families benefiting from the road, the amount and type of agricultural products produced, and the importance of agricultural production in a given area. LGUs are required to cover at least 10% of the project costs.

#### *Off-farm postharvest facilities*

Postharvest facilities are defined under AFMA as those facilitating threshing, drying, milling, grading, storage and handling of produce as well as stripping, inspecting, chipping and washing. To minimise postharvest losses, the DA has developed several **postharvest facility projects** jointly implemented with the DA within banner programmes (Table 2.3). Regional Field Units (RFUs) of the DA validate the appropriateness of the number and type of the identified postharvest facilities needed in specific locations and are responsible for procurement of the postharvest facilities required. Funds for projects are provided directly to RFUs by DA. The Philippine Center for Postharvest Development and Mechanization (PhilMech) provides monitoring and technical support for projects for grains and high-value crops. The Bureau of Animal Industry oversees projects concerning livestock and poultry. The Agribusiness and Marketing Assistance Service handles projects related to the provision of marketing facilities (food terminals and cold storage) (Manalili et al., 2015).

Table 2.3. **Programmes of the DA for establishment of postharvest facilities in 2014**[1]

| Commodity | Programme | Budgetary expenditures | | Description of the programme |
|---|---|---|---|---|
| | | PHP bln | USD mln | |
| Rice | Rice Mechanisation Program: Postharvest facilities component | 2.10 | 47 | Provision of combine harvesters, threshers, flat bed dryers, multi-purpose drying pavements, rice mills, warehouse construction and expansion, and rice processing centres. |
| | Rice Mechanisation Program: Rice Processing Center | 0.87 | 19 | Four rice processing centres established with the help of the Korean International Cooperation Agency. |
| Maize | Agri-Pinoy Maize Program: Postharvest facilities component | 0.62 | 14 | Maize postharvest processing and trading centres. |
| Highland vegetables | Tramline System[2] | 0.09 | 2 | Systems installed in highland areas (mostly Benguet, Abra). |
| Poultry | | 0.06 | 1 | Liquid egg processing plant. |
| High-value crops | Agri-Pinoy Trading Center Program | 1.04 | 23 | Establishment of regional trading centres for fruit and vegetables, and other high-value crops. |
| High-value crops, meat | National Cold Chain Program | 0.02 | 0.4 | Provision of refrigerated transport and storage facilities, refrigerated displays etc. |

1. Budgetary allocations by GAA in 2014; covers ongoing and completed projects.
2. A hauling facility using cable and pulleys to transport agricultural produce and inputs from mountainous production areas to the nearest accessible road to reduce the time and cost of transportation, hence a reduction in postharvest losses.

*Source:* Manalili et al. (2015).

### *Research and development*

The organisation of agricultural research and development (R&D) in the Philippines is complex with a **multi-level institutional structure**. Three departments (DOST, DA, DENR) have roles in technology creation within the agricultural sector. The main body is the PCAARRD under the DOST which acts as a central co-ordinating body and provides support to 132 R&D agencies, collectively called the National Agriculture and Resources Research and Development Network, as well as to 14 region-based consortia (Stads et al., 2007) (Table 2.4). The main task of PCAARD is to formulate policies, prioritise research topics and allocate state funds for R&D.

AFMA emphasised the importance of agricultural modernisation and strengthened the role of DA in agricultural R&D. It also created the Council for Extension, Research and Development in Agriculture and Fisheries to provide an effective linkage between research and extension. The main agency under the DA responsible for co-ordinating agricultural R&D is the **Bureau of Agricultural Research** (BAR). Several attached agencies to the DA are involved in R&D, including the Philippine Carabao Center, the Philippine Fibre Industry Development Authority, and GOCCs like PhilRice or the Philippine Coconut Authority.

More than half of the research agencies focused on agriculture in the Philippines conduct **research on crops** (Stads et al., 2007). R&D in rice is privileged. The Philippine Rice Research Institute (PhilRice), a government-owned and controlled research centre, was created in 1985 to develop rice technologies and innovations that address specific production problems in the Philippines. PhilRice co-ordinates the national R&D programme for rice and rice-based farming systems. Rice R&D activities are implemented through the network of 57 agencies composed of PhilRice experiment stations, regional agricultural research centres and state universities. PhilRice has strong research collaboration with the International Rice Research Institute (IRRI) – the oldest and largest international agricultural research institute in Asia. As IRRI pursues a global mandate and is financed by foreign governments, development agencies and foundations, its research efforts do not correspond to specific technology needs of the Philippines alone. Consequently, PhilRice adapts many of IRRI's innovations to local conditions (Bordey, 2010).

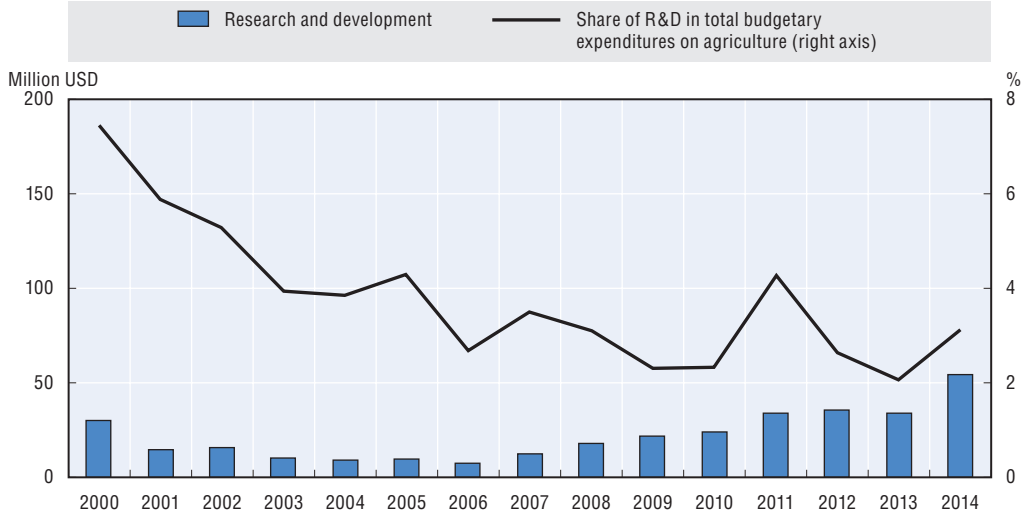
Table 2.4. **Institutions belonging to the National Agriculture and Resources Research and Development Network**

| Network level | Institutions | Assignments |
|---|---|---|
| Multi-commodity R&D centres (4) | Central Luzon University, University of the Philippines Los Baños, Visayas State University, University of Southern Mindanao. | Basic and applied research on a wide range of economically important commodities and disciplines. |
| National Single Commodity R&D centres (8) | Cotton Development Administration, National Tobacco Administration, Forest Products Research and Development Institute (under DOST), Ecosystems Research and Development Bureau (under DENR), Philippine Coconut Authority, Sugar Regulatory Administration, Philippine Rice Research Institute, Philippine Carabao Center. | Basic and applied research on a single commodity or theme. |
| Regional R&D centres (21) | 21 centres located in strategic places representing the basic agro-climates and based mostly at state colleges or universities, while others are under the DA. | Applied research on commodities of major importance to the regions in which they are located. |
| Co-operating Stations (90) | 90 co-operating stations that are a part of the DA, DENR, state colleges and universities, or private research centres located in various parts of the country. | Provide facilities for adaptive trials or field experiments, taking micro-environmental differences into account. |
| Specialising Agencies (9) | 9 specialised agencies include also private institutions with research facilities specialised for their commodity responsibilities. Three of the agencies are under DA: Bureau of Plant Industry, Bureau of Soils and Water Management, Agricultural Credit Policy Council. | Applied and adaptive research and development on a specific commodity or commodity mix under a given sector. |

*Source:* Stads et al. (2007).

Although by number of researchers, the Philippines has **one of the largest agricultural research systems** in Asia, budgetary expenditures on agricultural research have been low, particularly during the 1990s and 2000s (Stads et al., 2007; Aquino et al., 2013a). In 1997, AFMA stipulated that R&D should receive 10% of the annual budget for agriculture, but actual spending averaged around 4% until the end of the 2000s. Since 2010, government expenditure on agricultural R&D has increased substantially in absolute terms (Figure 2.7): PCAARRD and BAR received significant increases in their budgets during 2010-13. PCAARRD expanded its budget for R&D and technology delivery services, while BAR increased funding for national programmes on rice, maize, high value commercial crops and the promotion and development of organic agriculture (Aquino et al., 2013a). However, expenditure on R&D as a share of total budgetary expenditure on agriculture decreased to 3% over 2010-15, well below the 10% target (Figure 2.7).

Figure 2.7. **Budgetary expenditures on agricultural research and development, 2000-14**




*Source:* OECD (2016), "Producer and Consumer Estimates", *OECD Agriculture Statistics Database*.

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### *Extension*

The extension system in the Philippines is **fragmented**. It consists of six types of service providers: 1) national departments led by the DA and their respective bureaus and agencies; 2) LGUs; 3) state colleges and universities; 4) farmer associations such as co-operatives, irrigator associations and agrarian reform communities; 5) non-government and other civil society organisations; and 6) private sector e.g. agribusiness and banks. A major change was the adoption of the Local Government Code in 1991 that devolved government extension services to LGUs. The act abolished the DA's Bureau of Agricultural Extension and transferred its functions and staff to the LGUs at the provincial and municipal levels. The DA's responsibilities are limited to training of extension workers in the Agricultural Training Institute (ATI).

One of the weaknesses of the extension systems after the devolution is a weak link between R&D and the extension network (SEPO, 2009). Extension offices located in the LGUs are autonomous and have no vertical or horizontal linkages to each other, to ATI and to research institutions such as PhilRice, IRRI, DA Regional Agricultural Research Centers and state colleges and universities (Bordey, 2010). Another major weakness has been a longstanding underfinancing of extension services by the LGUs.

The importance of a strong extension system was highlighted by AFMA. ATI was reorganised to integrate and co-ordinate extension activities at the local level and link these activities with technology developers and private providers of extension services. Several programmes of the DA have an extension component and it is the ATI's responsibility to co-ordinate the delivery of an extension service with the bureau, agency, or relevant LGU responsible for a given programme's implementation.

AFMA stipulated allocation of 10% of the agricultural budget to extension services, but actual allocations remained low until the end of the 2000s (Bordey, 2010). Moreover, the actual level is difficult to assess as aggregated data on budgetary expenditures at the LGU level are rarely available. One indication of the weakness of the current extension system in the Philippines is a fall in the number of extension workers from about 17 000 in 1991 to 10 000 in 2015 (ATI, 2016).

### *Consumer measures*

The 1992 **Price Act** (RA 7581) allows price ceilings to be imposed on certain goods and commodities in times of national emergency declared by the President. The Act also declares that cartels, hoarding and profiteering from the supply, distribution, marketing and pricing of basic food necessities, especially during periods of calamity or emergency, are illegal. The DA conducts daily monitoring of prices of beef and poultry meat, rice, maize, cooking oil, fresh, dried fish and other marine products, fresh eggs, fresh and dried pork, fresh milk, fresh fruit and vegetables, root crops, sugar, coffee, fresh dairy products and pesticides, fertilisers (chemical and organic) and herbicides, poultry, swine and cattle feeds and veterinary products for poultry, swine and cattle (WTO, 2012).

The NFA is responsible for price stabilisation of rice through imports and stock releases. It also intervenes in the consumer rice market through its **rice distribution programme**. The government release price is the price at which the NFA sells rice. It is set at a level that allows accredited retailers to buy rice stocks from the NFA at "reasonable" prices and still earn profit, despite the gradual policy shift of the NFA to adjust its release prices closer to those in the domestic market. The rice release price is set at two levels: wholesale and retail.

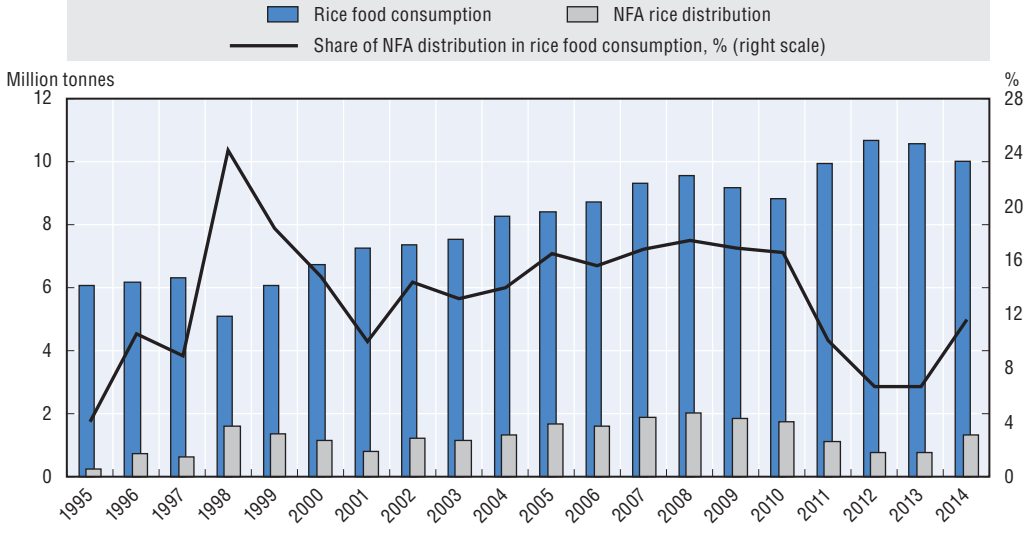
At the wholesale level, the mandatory price is the price at which rice is sold by the NFA to licensed and accredited retailers only. At the retailer or consumer level, the mandatory price is the price at which the NFA sells rice directly to end-consumers and non-retailers (DA, 2015).

The share of rice sold by NFA through the rice distribution programme in total rice consumption (as food) averaged 13% over the past twenty years (Figure 2.8). NFA focuses rice distribution to the rice-deficit provinces and provinces classified under the Accelerated and Sustainable Anti-Poverty Program (ASAPP). Compared to the NFA's activities in procurement of paddy rice (Figure 2.2), the scale of its intervention and impacts on consumer prices are more pronounced (Figure 2.9). Over 1990-2014, the government's wholesale and retail prices were more than 20% lower, on average, compared to the respective domestic market prices (Figure 2.9). However, the NFA's quasi-monopoly power over rice imports kept domestic prices, both "market" and government-set, much above world market prices, even during the 2008 food crisis. This shows the strong implicit taxation of Philippine rice consumers by the current policy settings (Section 2.5).

Despite inclusion of provinces covered by the ASAPP, the NFA rice distribution programme is not well-targeted.[21] In fact, anyone can buy NFA rice sold in the accredited retail stores without needing to be prequalified (Fernandez and Velarde, 2012). According to Fernandez and Velarde (2012), the rice distribution programme reached 47.7% of poor households in 2009 despite being implemented for about fifty years. The programme is also costly: it costs USD 2.2 to provide USD 1 of subsidy to consumers (Jha and Mehta, 2008).

Since 1997, various **school food programmes** have been implemented by the Department of Education. In 2005, a Food for School Program was implemented that provided one kilogram of rice to eligible families for every day that their children attended school. The current programme, called the School-Based Feeding Program, was introduced in 2010 and is targeted at families suffering from severe hunger. Under the programme, children are provided a meal in school for 100-120 days during the school year (Albert et al., 2015).

Figure 2.8. **Share of rice distribution by NFA in total rice consumption, 1995-2014**




*Source:* DA (2015).

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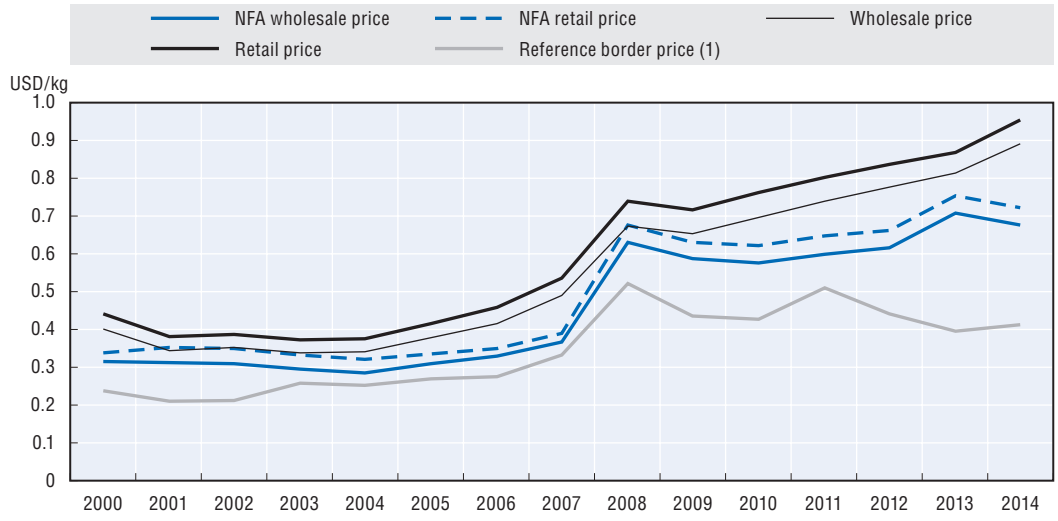
Figure 2.9. **Government-set and market prices of milled rice, 2000-14**




1. Viet Nam FOB price adjusted to the Philippine border.
*Source:* DA (2015), Philippine Statistics Authority, OECD (2016), "Producer and Consumer Estimates", *OECD Agriculture Statistics Database*.

StatLink http://dx.doi.org/10.1787/888933452482

## 2.4. Trade policies affecting agro-food trade flows and agricultural commodity prices

The objectives of agro-food trade policy in the Philippines are closely related to the overall agricultural policy objectives: namely, to achieve food self-sufficiency, particularly in rice, and to ensure sufficiently high and stable food prices to enhance farm incomes and alleviate rural poverty (WTO, 2012). This section provides an overview of reforms of the trade system, currently applied import and export policy measures as well as multilateral and bilateral trade relations affecting Philippine agro-food trade.

### *Overall reforms of the trade system*

Until the mid-1980s the trade policy of the Philippines was **protective**. Trade policy instruments included government monopoly control over international trade and domestic marketing operations, import bans, quantitative trade restrictions, import licensing, export taxes and export bans (David et al., 2009). The first steps towards liberalisation were taken in the 1980s with the Tariff Reform Program (TRP) and Import Liberalization Program. The TRP was launched as part of the World Bank's structural adjustment loan package in 1981 (David et al., 2009). Its first phase (TRP I) consisted of three components: tariff reductions, import-liberalisation and realignment of indirect taxes. Over 1981-85, tariffs were compressed from a range of 0-100% to 10-50%. However, the Import Liberalization Program, aimed at lifting quantitative restrictions on imports, was abandoned in 1983 due to a balance of payments crisis, but resumed in 1986 (Manzo, 2007). Liberalisation did not cover imports of agricultural commodities, but did cover fertiliser and wheat imports and removal of agricultural export taxes.

In the 1990s, three major **trade liberalisation** developments took place: implementation of the subsequent phases of TRP; initiation of the AFTA in 1992; and the Philippines' accession to the WTO in 1995.

TRP II was launched in 1991 and consisted of efforts to cluster tariff rates within the 10-30% range by 1995. Conversion of quantitative restrictions into tariff equivalents started in 1992, but was stopped by the adoption of the Magna Carta for Small Farmers (RA 7607) which stated: "Importations shall not be allowed of agricultural products that are produced locally in sufficient quantity". Accordingly, tariff quotas were introduced in 1993 for maize, pork, poultry, but not for beef and sugar (Piadozo, 2012).

TRP III started in 1995 with the goal of developing a four-tier tariff schedule: 3% for raw materials and capital equipment not available locally; 10% for raw materials and capital equipment available from local sources; 20% for intermediate goods; and 30% for finished goods (Piadozo, 2012). The same year the Philippines **acceded to the WTO** and committed to gradually remove quantitative restrictions on imports of sensitive agricultural imports, with the exception of rice (Cororaton, 2008). However, over 2004-08, protection of the agricultural sector barely decreased, largely due to the introduction of a tariff quota system under the WTO minimum access volume (MAV) clause for sensitive agricultural products. While relatively high tariff rates were imposed on imports up to a minimum access level (in-quota rate), even higher rates were levied beyond the minimum import level (out-of-quota tariff rate) (Piadozo, 2012; Table 2.A1.6). Three measures contributed to the preservation of a relatively high agricultural protection: the "tariffication" of non-tariff barriers into high tariffs; the retention of quantitative restrictions on rice imports; and Sanitary and Phytosanitary (SPS) measures on the issuance of import permits (WTO, 2005).

The goal of TRP IV (1998-2000) was to enhance the country's global competitiveness. The previous tariff structure was replaced with a more flexible structure and the average nominal tariff declined from 13% to 8% during 1998-2000 (Manzo, 2007). Over 2005-15, the government continued to pursue a high import-protection policy and made efforts to retain MAV for rice, which has now been extended to 2017. Those said, steps were taken within the ASEAN Free Trade Area to lower tariffs and abolish quantitative restrictions, except for highly sensitive commodities.

### *Import policy measures*

#### *Tariffs*

Tariffs are the main instrument of Philippine trade policy. The current trade policy for agricultural products is based on the 1996 Republic Act 8178, "An act replacing quantitative restrictions on agricultural products, except rice, with tariffs, creating the Agricultural Competitiveness Enhancement Fund and for other purposes". The act has been referred to as the **Agriculture Tariffication Act**. Upon its adoption, a number of previous laws prohibiting the importation of different agricultural products were repealed. After its implementation, all agricultural products can be imported without quantitative restrictions, except for rice, which is controlled by the NFA (Aquino et al., 2013b).

In general, the Philippines applies tariffs in agriculture far below their bound levels (Table 2.5). In 1999, the simple average applied MFN on agricultural products (HS 1-24) was 14.8%. It decreased to 10.2% by 2003 and since then declined only marginally to 9.9% in 2014. All tariff lines applied are *ad valorem* and range from 0-65%, with the highest applied to sugarcane (Table 2.5 and Table 2.A1.5). High protection is also applied to sensitive products like rice, maize, pork and poultry meat, potatoes, onions, garlic and coffee. Tariffs are reviewed every 5 years to assist business sectors in their long-term strategic plans (WTO, 2012).

Table 2.5. **Final bound and applied MFN tariffs on agricultural products in 2009 and 2014**

| | Final bound rates | | MFN applied 2009 | | MFN applied 2014 | |
|---|---|---|---|---|---|---|
| | Average | Maximum | Average | Maximum | Average | Maximum |
| Animal products | 36.5 | 50 | 20.8 | 45 | 20.5 | 45 |
| Dairy products | 27.2 | 40 | 3.9 | 7 | 3.9 | 7 |
| Fruit, vegetables, plants | 37.3 | 60 | 9.8 | 40 | 9.7 | 40 |
| Coffee, tea | 41.2 | 50 | 14.9 | 45 | 15.7 | 45 |
| Cereals and preparations | 37.7 | 50 | 10.8 | 50 | 10.2 | 50 |
| Oilseeds, fats and oils | 36.7 | 60 | 5.6 | 15 | 5.4 | 15 |
| Sugars and confectionery | 42.8 | 80 | 15.2 | 65 | 20.4 | 65 |
| Beverages and tobacco | 44.8 | 50 | 8.2 | 15 | 8.2 | 15 |
| Cotton | 10.0 | 10 | 2.6 | 3 | 2.6 | 3 |
| Other agricultural products | 24.9 | 50 | 3.4 | 35 | 3.6 | 35 |

*Source:* UNCTAD (2014), *World Tariff Profiles*.

Maize is protected by high in- and out-quota tariff rates (35% and 50% respectively) (rice is discussed separately below). Within ASEAN Trade in Goods Agreement (ATIGA) the tariff on maize has been reduced to 5%. Relatively high border protection undermines the competitiveness of the animal production.

### *Tariff quotas*

The Agricultural Tariffication Act (RA 8178) converted all trade barriers into tariffs, as agreed in WTO accession negotiations. As part of the tariffication package, the Philippines was required to maintain current import access opportunities at levels corresponding to those existing during the 1986-88 base period. For sensitive agricultural products, the **minimum access volumes (MAVs)**, calculated as a share of domestic consumption in the base period, had to increase from 3% in 1995 to 5% in 2004. This involved introduction of tariff quotas for 14 agricultural products with in-quota tariffs ranging from 30-50% and out-of-quota tariffs from 40-100% in 1996 (Tables 2.A1.6 and 2.A1.7). MAVs had gradually been increased by the mid-2000s in line with WTO commitments, but subsequently remained unchanged. While in-quota tariffs have remained unchanged for most products since 1996, out-of-quota tariffs had been reduced by 2005, but have remained unchanged since then. As a result, by 2005, the in-quota and out-of-quota tariffs had been equalised for several commodities such as potatoes, onions, garlic and poultry, but the overall level of tariffs for the 14 products covered by the quota system remained high, ranging from 30% (in-quota tariff for live swine, live sheep and pork meat), to 65% (out-of-quota tariff for sugarcane) (Table 2.A1.6).

The **system of administering tariff quotas** is complex, a possible reason why quotas are often under-filled (Manzo, 2007). A MAV Management Committee chaired by the Secretary of Agriculture issues MAV licences to importers. Tariff quotas are allocated twice a year and priority is given to importers who have not surrendered their previous year quota; the remaining volume is distributed to interested applicants on a first-come-first-served basis (WTO, 2005).

### *Special treatment clause for rice*

Upon joining the WTO in 1995, the Philippines benefited from a **special treatment clause** (Article 5 of the Agreement on Agriculture) which allowed it to maintain quantitative restrictions on rice imports on the basis of the government's stated aim of food security until 2005. That said, the Philippines had to guarantee a MAV in the form of a progressively increasing import quota.

Initially, the quantity of rice imports under the **MAV**, valid until 2005, was small, at 59 730 tonnes (Table 2.6), compared to annual rice imports by the Philippines varying from 0.3 to 2.4 million tonnes over 1995-2014. At the Philippines' request, the special treatment clause on rice was extended from 2005 to 2012. As a concession, the Philippines had to increase the MAV for rice to 350 000 tonnes and reduce its in-quota tariff to 40%, while the out-of-quota tariff remained at 50%. In 2012, the Philippines requested a new extension of its special treatment for rice through a waiver until 2017. The waiver was granted in July 2014 on the condition that the Philippines increased the MAV to 805 200 tonnes, lowered the in-quota tariff to 35% and that, after 30 June 2017, its importation of rice would be subject to ordinary customs duties established on the basis of a tariff equivalent to be calculated in accordance with the guidelines defined in the WTO Agreement on Agriculture (WTO, 2014a). Under the MAV, country-specific quotas are provided to Australia, China, El Salvador, India, Pakistan, Thailand and Viet Nam (Table 2.7).

Table 2.6. **Minimum access quotas for rice negotiated in WTO, 1995-2017**

| | Size of quota and in-quota tariff rate | | Out-of-quota tariff rate |
|---|---|---|---|
| | tonnes | % | % |
| 1995 | 59 730 | 50 | 50 |
| 1999 | 119 460 | 50 | 50 |
| 2000 – June 2005 | 238 940 | 50 | 50 |
| July 2005 – 30 June 2012 | 350 000 | 40 | 50 |
| 1 July 2012 – 30 June 2013 | 350 000 | 40 | 50 |
| 1 July 2013 – 30 June 2014 | 645 134 | 40 | 50 |
| 1 July 2014 – 30 June 2015 | 805 200 | 35 | 50 |
| 1 July 2015 – 30 June 2017 | 805 200 | 35 | 50 |

*Source:* WTO (2014a).

Table 2.7. **Country-specific rice quotas, 2013-17**

| | Annual country specific quotas until 30 June 2017 (in tonnes and on a milled basis) | | | |
|---|---|---|---|---|
| WTO Member | 1 July 2013 –30 June 2014 | 1 July 2014 –30 June 2015 | 1 July 2015 –30 June 2016 | 1 July 2016 –30 June 2017 |
| Australia | 15 000 | 15 000 | 15 000 | 15 000 |
| China | 40 000 | 50 000 | 50 000 | 50 000 |
| El Salvador | 4 000 | 4 000 | 4 000 | 4 000 |
| India | 40 000 | 50 000 | 50 000 | 50 000 |
| Pakistan | 40 000 | 50 000 | 50 000 | 50 000 |
| Thailand | 228 067 | 293 100 | 293 100 | 293 100 |
| Viet Nam | 228 067 | 293 100 | 293 100 | 293 100 |

*Source:* WTO (2014a).

### *State trading*

The NFA is a state trading enterprise of the Philippines (Section 2.2). In the 1970s, during a surge in world commodity prices, the government's monopoly control over trade was expanded from rice and maize to wheat, soybeans, soybean meal, ruminant livestock and beef. Monopoly controls, except for rice and maize, were lifted in the mid-1980s. If needed, the NFA also has the authority to stabilise sugar prices. When there is a shortfall in the domestic market of maize and sugar, the NFA can import them to stabilise prices. In practice, the NFA has not been involved in sugar importation thus far. Another role of the NFA is to issue export permits when the domestic demand for maize has been met (WTO, 2012).

The NFA has the power to establish rules and regulations governing the importation of rice. It is also tasked with issuing import licences, and imposing and collecting fees and charges on rice imports to equalise the selling price of imported rice with that on the domestic market. The volume of rice imports is determined by the NFA Council using projections of paddy rice production and the supply-demand gap and approved by the President. Imports of rice are allowed to cover the annual shortfall in production, which substantially exceeds the Philippines' WTO MAV commitment. During recent years, the private sector has been allowed to import rice equal to the MAV commitment; all out-of-quota rice is imported by the NFA (WTO, 2012).

In the 1990s, private sector imports were small (about 50 000 tonnes), but in 2015, for example, had increased to 612 400 tonnes. The NFA conducts the import bidding process (Cororaton, 2013), and each importer is allowed to bid for a maximum of 20 000 tonnes (Tobias et al., 2012). Quota is allocated on a first-come-first-served basis, based on the date and time of the advance payment of import tariff to the LBP (NFA memorandum circular AO-2014-01-001).

### *Import licences*

Regulated by the Tariff and Customs Code of 1978, **import licensing** is intended to safeguard public health, national security and welfare and to meet international treaty obligations. Licences are also used to manage agricultural tariff rate quotas. There are two types of import licence: regular licences, issued annually for tariff quotas at the start of a quota year, and special licences, which are issued for quotas reallocated from the surrendered volumes during the quota year. Processing special licences takes about one month. Importers generally need to register with the Bureau of Customs (under the Department of Finance) but some goods (e.g. coconut products, coffee, fish products, plants, and sugar), have additional requirements, such as SPS accreditation from the DA. Under ASEAN, the Philippines is required to implement a "national single window" to expedite trade.

### *SPS on imports*

The DA manages the implementation of the **Sanitary and Phytosanitary (SPS) Agreement** and maintains an SPS Notification Authority and Enquiry Point and an SPS Information System. From the entry into force of the WTO-SPS Agreement in 1995 until mid-September 2016, the Philippines had made about 350 notifications to the WTO Committee on Sanitary and Phytosanitary Measures, covering a wide range of measures, including imposition of temporary import restrictions, on grounds of food safety, animal health, plant protection and their termination.[22] The Philippines is a member of the standard setting bodies of the WTO-SPS Agreement, namely *Codex Alimentarius*, OIE (World Organisation for Animal Health) and IPPC (International Plant Protection Convention).

The Food Safety Act of 2013 delineates the jurisdiction of the DA and the Department of Health for the safety of food: the former for primary and post-harvest food and the latter for processed and pre-packaged foods.

The **regulatory agencies** of the DA are responsible for ensuring food, animal and plant safety through imposition of SPS measures. Any importer who desires to import any agricultural and fish and fishery/aquatic products, as well as fertilisers, pesticides and other agricultural chemicals, veterinary drugs and biological products into the Philippines must secure an SPS Import Clearance (SPS-IC), pre-market or prior to importation from any of the following agencies: (a) Bureau of Animal (BAI) for animals, animal feeds and feeds ingredients,

animal products and by-products including meat and meat products, eggs, milk, dairy, veterinary drug and biological products; (b) Bureau of Fisheries and Aquatic Resources (BFAR) for fish, fishery/aquatic products, and fish intended for feeds and products used in fish propagation; (c) Bureau of Plant Industry (BPI) for plant and plant products; (d) Fertilizer and Pesticides Authority (FPA) for fertiliser, pesticides and other agricultural chemicals.[23] The decision to issue an SPS-IC is based on a risk analysis performed by these agencies.

Imports of agricultural products, live animals, plants, their products and by-products must be accompanied by several documents, including the SPS-IC, and an international sanitary, phytosanitary or health certificate from their country of origin and are subject to inspection upon arrival by the DA Border Inspector. The SPS permit clearance is valid for one shipment and is not transferrable to other persons. Generally, only SPS considerations are taken into account when issuing certificates. However, in some cases, domestic supply is also considered (WTO, 2012), presumably leading to alleged discriminatory treatment due to non-science-based requirements, mainly for animal products.

The DA Border Inspector performs quarantine and product safety and quality inspection, documentation and clearance. The BAI of the DA is responsible for preventing the entry and spread of exotic and communicable **animal** diseases and safeguarding animal health and industries, as well as control measures for feeds and feedstuff. All meat and meat products require a Foreign Meat Inspection Certificate signed by an authorised veterinarian. Imports of meat and meat products are also subject to inspection and require a Veterinary Quarantine/ SPS Import Clearance issued by the BAI prior to shipment: meat imports must originate in a foreign establishment recognised as an exporting entity by the Veterinary Administration and accredited in the Philippines (DA, 2015). The National Meat Inspection Service (NMIS), also under the DA, promulgates and implements policies, procedures, guidelines, rules and regulations governing post production flow of livestock and meat and meat products (both locally produced and imported). Thus, while the BAI inspects the shipments at the border, the NMIS inspects meat and meat products at the cold storage (or so called "second border") level (DA, 2016).

Imports of **fish and fish products** require an SPS-IC issued by BFAR under the DA. Fish imports are subject to a physical examination and microbiological analysis upon arrival. If considered safe, a Fishery Sanitary and Phytosanitary Cerificate is issued to release imports. Imports of live exotic species and live shrimp and prawns have been prohibited, based on an import risk analysis (DA, 2015; WTO, 2012).

The BPI is responsible for measures related to protecting **plant** health. It conducts pest risk analysis, issues phytosanitary certificates, implements measures regulating the international and domestic movement of plants and plant products, and maintains the official pesticide residue analysis laboratories. BPI is also responsible for approving biotechnology-derived plants for food and feeds. Importers of plants and plant products must register with the BPI National Plant Quarantine Services Division before applying for a Phytosanitary Certificate. Commodities with no record of previous importation are subject to pest risk analysis (DA, 2015).

All **genetically modified** (GM) imported plants and plant products must be authorised by the BPI and must be accompanied by a declaration of GM content issued by an authorised body in the country of origin or by an accredited laboratory (Administrative Order No. 8 from 2002). BPI issues an Approval Registry for plants and plant products that have undergone an approval process and these plants require only a phytosanitary certificate for release from

customs. BPI randomly checks imported plant products to assess GM content, particularly for commodities known to be genetically modified overseas (DA, 2015). Following a petition by environmentalists, the Philippine Supreme Court declared AO 8 null and void in December 2015. Applications for contained use, field testing, propagation, commercialisation and importation of GM products were prohibited until a new Administrative Order is issued (PIDS, 2016). In response, a Joint Department Circular (JDC) was drafted and approved by five Departments in March 2016 replacing AO 8 and designed to improve transparency in the approval process for permits to plant, import and commercialise GM products, including enhanced regulations on risk assessment.[24] In July 2016, the Philippine Supreme Court upheld the JDC as addressing all issues raised in its declaration of December 2015 and ruled that the JDC reflects the existing regulatory framework for GM products, superseding AO 8.

### *Export policy measures*

All export taxes on agricultural products ended in 1996 and the Philippines has not used export subsidies. Export activities are mainly undertaken by the private sector, with minimum assistance from the government.

Several agricultural commodities are subject to **export controls** and may require permits and agency approval: rice, grains and grain products, sugar and molasses. Exports of rice and maize remain restricted and, in principle, controlled by the NFA and may only be exported if there is a surplus. Any exports require a permit from the DA, and a sanitary certificate, both granted on a per-shipment basis (DA, 2015). Minimum export prices continue to apply for rice and maize; however, these are generally based on world prices (WTO, 2012).

The President may, upon NEDA's recommendation, **impose an export quota** on any good, taking into account factors such as domestic demand, the world price, and preferential treatment granted to Philippine exports by foreign governments. Exports of sugar are subject to bilateral restraints: the Philippines' sugar exports to the United States are subject to quota restrictions. The Sugar Regulatory Administration is responsible for the administration of sugar export quotas (WTO, 2012).

For plant products, the **export certification procedures** and phytosanitary certification system is based on the IPPC standards. For meat and meat products, issuance of export certificates is based on the requirements of the importing country. Two government agencies separately issue International Veterinary Certificates and Official Meat Inspection Certificates for exports. All exports must be covered by either an export declaration issued by the Bureau of Customs or through the one-stop export documents centres, or electronically through the Single Administrative Document. Certificates of origin are required for exports under the WTO Generalised System of Preferences and AFTA. Other permits and licences may be required for exports that are regulated or prohibited (DA, 2015).

### *Trade relations*

#### *WTO*

The Philippines is a founding member of the WTO in 1995. The **main commitments** of the Philippines under the WTO are:

- Removal of quantitative restrictions (QR) and conversion of QRs into their tariff equivalents (tariffication).
- Reduction of tariffs on agricultural products: reduce average tariffs by 24% with a minimum 10% cut per tariff line from 1995-2004.

- Implement a TRQ or MAV system.
- Bind tariffs for almost all tariff lines in agriculture to specified rates. Initial bound tariff rates for most sensitive agricultural tariffs were 95% to 100% in 1995, to be reduced to 10-50% by 2004.
- Prohibit additional non-tariff measures, i.e. such as import licencing, variable import levies, import quotas and import bans (Manzo, 2007).

Although the Philippines agreed to reduce **domestic support**, in practice, it did not have to make reductions because the aggregate measure of support for government expenditures on fertiliser subsidies, certified seeds and planting materials and the price support for rice, maize and sugar fell below the *de minimis* level of 10% of the value of production applied to developing countries (NAFC, 2007). That said, the Philippines is precluded from future use of such support beyond the *de minimis* level.[25]

In addition, important commitments were made by the Philippines on the harmonisation of SPS measures with international standards, and on putting in place a *sui generis* system of plant variety patent registration and protection (Manzo, 2007).

### *ASEAN*

The Philippines is a founding member of the Association of Southeast Asian Nations (ASEAN) together with Indonesia, Malaysia, Singapore and Thailand. The **ASEAN Free Trade Area** (AFTA) was initiated in 1992 to reduce Common Effective Preferential Tariffs (CEPT) among ASEAN members to 0-5% and to abolish quantitative restrictions and other non-tariff barriers by 2010 (Piadozo, 2012). The 2009 ASEAN Trade in Goods Agreement (ATIGA) required 98-100% of all tariff lines for all countries to be included in CEPT by 2015. Philippine tariffs on maize and sugar for AFTA members had fallen to 5% by 2015; however, rice had only been reduced to 35%, under a waiver in the ATIGA Protocol to Provide Special Consideration for Rice and Sugar.[26]

The **ASEAN Economic Community** was established in 2015. The Community consists of three pillars: political-security, socio-cultural and economic and seeks to establish a single market based on free movement of goods, free flow of investment, freer flow of capital and free movement of skilled labour. A blueprint adopted in the end of 2015 sets out a timeline and targets for advancing the economic pillar from 2016 to 2025. Goals include: 1) a highly integrated and cohesive economy; 2) a competitive, innovative and dynamic ASEAN; 3) enhanced connectivity and sectoral co-operation; 4) a resilient, inclusive people-oriented and people-centred ASEAN; and 5) a global ASEAN (ASEAN, 2015).

In addition to trade agreements between ASEAN and individual countries (Korea, China, Australia and New Zealand, India), the Philippines has a **bilateral trade agreement** with Japan (Table 2.8). Not all commitments under these agreements are yet in effect, as many have transition periods until 2016 and 2020, although significant trade liberalisation has taken place under AFTA (Table 2.9). In 2016, the Philippines signed a trade agreement with the European Free Trade Area (EFTA) and started negotiations on an agreement with the European Union (EU).

Table 2.8. **Philippine commitments under Free Trade Agreements**

| FTA and members | Entry into force | Liberalisation commitments |
|---|---|---|
| ASEAN Free Trade Agreement (AFTA): ASEAN Members | 1992 | Under the Common Effective Preferential Tariff (CEPT), ASEAN members apply a tariff rate between zero and 5% for all products, including those previously deferred on countries' sensitive and highly sensitive lists. |
| ASEAN – Korea Free Trade Agreement: Korea and ASEAN members | 2008 | Tariffs for sensitive products will be reduced to 0-5% by 2016. Tariffs for highly sensitive products will be capped at 50%, and reduced by 50% or 20% by 2016. |
| ASEAN – Japan Comprehensive Economic Partnership Agreement: Japan and ASEAN members | 2008 | Progressive elimination of substantially all discrimination between ASEAN and Japan. From 2018 97.1% of tariff lines will be duty free |
| Japan – Philippines Economic Partnership Agreement: Japan and Philippines | 2008 | From 2018, 98.6% of all tariff lines will be duty free; of the remaining duties the highest (47.2%) will remain on vegetable products after the transition period. |
| ASEAN – China: ASEAN members and China | 2007 | Tariffs for sensitive products will be reduced to 0-5% by 2018. Tariffs for highly sensitive products to be reduced to not more than 50% by 2015. 28 tariff lines excluded from reduction. |
| ASEAN-ANZ: ASEAN members, Australia, New Zealand | 2010 | By 2020, 94.59% of all Philippine tariff lines will be duty free. The highest remaining tariff will be applied to maize. |
| ASEAN – Indian FTA: ASEAN members and India | 2011 | From 2022, 87.5% of tariff lines will be duty free; highest tariff rates will be applied to meat, preserved or prepared pork, turkey and geese, onions, sweet potatoes, cabbages and coffee. |

*Source:* WTO (2012).

Table 2.9. **Summary of the Philippines' MFN and preferential tariff averages, 2016**

| | No. of lines | MFN applied, % | ASEAN Common Effective Preferential Agreement, % | ASEAN-Korea FTA, % | ASEAN-China FTA, % | ASEAN-Australia New Zealand FTA, % | ASEAN-India FTA, % | ASEAN-Japan Comprehensive Economic Partnership Agreement, % | Philippines-Japan EPA, % |
|---|---|---|---|---|---|---|---|---|---|
| Animal products | 162 | 23.15 | 1.08 | 5.67 | 11.45 | 7.92 | 16.05 | 4.89 | 3.48 |
| Dairy products | 38 | 2.95 | - | - | - | 0.76 | 2.06 | 0.66 | 0.89 |
| Fruit, vegetables, plants | 348 | 9.80 | 0.09 | 2.28 | 3.58 | 1.10 | 4.87 | 1.82 | 0.95 |
| Coffee and tea | 43 | 17.02 | - | 1.51 | - | 2.44 | 7.11 | 3.14 | 3.05 |
| Cereals and preparations | 189 | 10.65 | 1.88 | 0.64 | 2.86 | 0.57 | 4.53 | 1.53 | 1.19 |
| Oil seeds, fats and oils and their products | 198 | 7.28 | - | 1.48 | - | 0.05 | 2.45 | 1.23 | 1.06 |
| Sugars and confectionery | 35 | 16.86 | 1.14 | 0.80 | 10.09 | - | 3.64 | 0.92 | 3.77 |
| Cotton | 5 | 2.60 | - | - | - | - | 1.00 | - | - |
| Other agricultural products | 194 | 4.74 | - | 0.31 | 1.54 | 0.15 | 1.55 | 0.54 | 0.37 |

*Notes:* Calculations exclude in-quota rates and exclusions from concessions, but for more complete commodity coverage it can be added that in-quota tariff on rice was 35% in 2016 for all agreements except for ASEAN-China FTA where it was 50%. Out-quota tariff on rice was 50% in all cases, except for ASEAN Common Effective Preferential Agreement, where it was 35%.

*Source:* Tariff Commission, Republic of the Philippines (2016).

## 2.5. Evaluation of support to agriculture

This section presents a **quantitative evaluation of support** provided to agriculture through the domestic and trade policies for the period 2000 to 2014. The evaluation is based on the indicators of agricultural support developed by the OECD, including the Producer Support Estimate (PSE), Consumer Support Estimate (CSE), General Services Support Estimate (GSSE), Total Support Estimate (TSE) and others (Box 2.8).

### Box 2.8. **OECD indicators of support to agriculture**

**INDICATORS OF SUPPORT FOR PRODUCERS**

***Producer Support Estimate (PSE):*** The annual monetary value of gross transfers from consumers and taxpayers to agricultural producers, measured at the farm gate level, arising from policy measures that support agriculture, regardless of their nature, objectives or impacts on farm production or income.

***Percentage PSE (%PSE):*** PSE transfers as a share of gross farm receipts (including support).

***Producer Nominal Assistance Coefficient (producer NAC):*** The ratio between the value of gross farm receipts (including support) and gross farm receipts valued at border prices (measured at farm gate).

***Producer Nominal Protection Coefficient (producer NPC):*** The ratio between the average price received by producers at farm gate (including payments per tonne of current output), and the border price (measured at farm gate). The producer NPC is also available by commodity.

***Producer Single Commodity Transfers (producer SCT):*** The annual monetary value of gross transfers from consumers and taxpayers to agricultural producers, measured at the farm gate level, arising from policy measures directly linked to the production of a single commodity such that the producer must produce the designated commodity in order to receive the transfer.

***Producer Percentage Single Commodity Transfers (producer %SCT):*** The commodity SCT expressed as a share of gross farm receipts for the specific commodity (including support).

**INDICATORS OF SUPPORT TO CONSUMERS**

***Consumer Support Estimate (CSE):*** The annual monetary value of gross transfers from (to) consumers of agricultural commodities, measured at the farm gate level, arising from policy measures that support agriculture, regardless of their nature, objectives or impacts on consumption of farm products. If negative, the CSE measures the burden (implicit tax) on consumers through market price support (higher prices), that more than offsets consumer subsidies that lower prices to consumers.

***Percentage CSE (%CSE):*** CSE transfers as a share of consumption expenditure on agricultural commodities (measured at farm gate), net of taxpayer transfers to consumers.

***Consumer Nominal Assistance Coefficient (consumer NAC):*** The ratio between the value of consumption expenditure on agricultural commodities (at farm gate) and that valued at border prices (measured at farm gate).

***Consumer Nominal Protection Coefficient (consumer NPC):*** The ratio between the average price paid by consumers (at farm gate) and the border price (measured at farm gate).

***Consumer Single Commodity Transfers (consumer SCT):*** The annual monetary value of gross transfers from (to) consumers of agricultural commodities, measured at the farm gate level, arising from policy measures directly linked to the production of a single commodity.

**INDICATORS OF SUPPORT TO GENERAL SERVICES FOR AGRICULTURE**

***General Services Support Estimate (GSSE):*** The annual monetary value of gross transfers to general services provided to agricultural producers collectively (such as research, development, training, inspection, marketing and promotion), arising from policy measures that support agriculture regardless of their nature, objectives and impacts on farm production, income, or consumption. The GSSE does not include any transfers to individual producers.

***Percentage GSSE (%GSSE):*** GSSE transfers as a share of Total Support Estimate (TSE).

**INDICATORS OF TOTAL SUPPORT TO AGRICULTURE**

***Total Support Estimate (TSE):*** The annual monetary value of all gross transfers from taxpayers and consumers arising from policy measures that support agriculture, net of associated budgetary receipts, regardless of their objectives and impacts on farm production and income, or consumption of farm products.

***Percentage TSE (%TSE):*** TSE transfers as a percentage of GDP.

A detailed description of the **OECD methodology** to estimate agricultural support (the "PSE Manual") and a comprehensive database for OECD and selected non-OECD countries including the Philippines are available from *http://oe.cd/pse*. The methodology applied in this study is fully consistent with that used for other countries as presented in OECD reports that monitor and evaluate agricultural policies (OECD, 2016). Box 2.9 provides basic information on how this methodology has been applied in the case of the Philippines.

### Box 2.9. **The Philippine's PSEs: What and how?**

**Period covered:** 2000-14.

***Products covered:*** Rice, maize, coconuts, bananas, sugarcane (centrifugal), mango, pineapple, beef and veal, pigmeat, poultry and eggs. These 11 commodities account for 88% on average of the total value of gross agricultural output (GAO) in the Philippines during the entire fifteen-year period 2000-14. The seven crop products account for 76% of the value of total crop production in 2012-14, while the four animal products represent on average 94% of total animal production. For the purposes of calculating market price gaps, five commodities are treated as exported: coconut, banana, sugarcane, mango and pineapple. The remaining six are considered imported.

**Market Price Support**

***Producer prices:*** Average prices received by producers, sourced from the Philippine Statistics Authority.

***Price gap estimates:*** For all the above listed products relevant data have been collected and price gaps calculated. For three exported products (bananas, mangos and pineapple), no export subsidies nor other market price policies either supporting or taxing producers have been identified. Consequently, in line with the OECD methodology, and as applied for other countries, the price gaps for these products have been set to zero. For pork, beef, poultry and eggs, the annual average tariff rates were used to estimate the price gaps as trade flows for these commodities have been very small and it was not possible to identify consistent reference prices. External reference prices were used for remaining four products: rice, maize, sugarcane and coconuts.

***External reference prices:*** Milled rice export price quotes of Viet Nam adjusted to the Philippine border is used for rice. The average import unit value at the Philippine border is applied for maize. For coconuts the average export unit value of crude coconut (copra) oil at the Philippine border is used. For sugarcane the average export unit value of centrifugal sugar at the Philippine border is applied.

***Marketing margins:*** The marketing margin indicates processing, handling and transportation costs for a given commodity. Margins between the farm gate and wholesale market were calculated as the absolute difference between the farm gate price and the average wholesale price provided by the PSA, ensuring that prices are expressed on the same processing level (sugar, coconuts). In case of coconuts, the marketing margin was assumed to be 6.1% based on the analysis of the coconut value chain by Pabuayon, et al. (2009). Transportation costs from border to wholesale market are assumed to range from 1% to 5% of the order reference price.

***Quality adjustments:*** No quality adjustments were made.

**Budgetary Support**

Budgetary information for the period 2000-14 originates from DA and DBM. It covers budgetary expenditures undertaken by DA, DAR and GOCC. It incorporates transfers to local governments for agricultural programmes. However, it does not include local co-financing, as there is no data on this.

## *Support to agricultural producers*

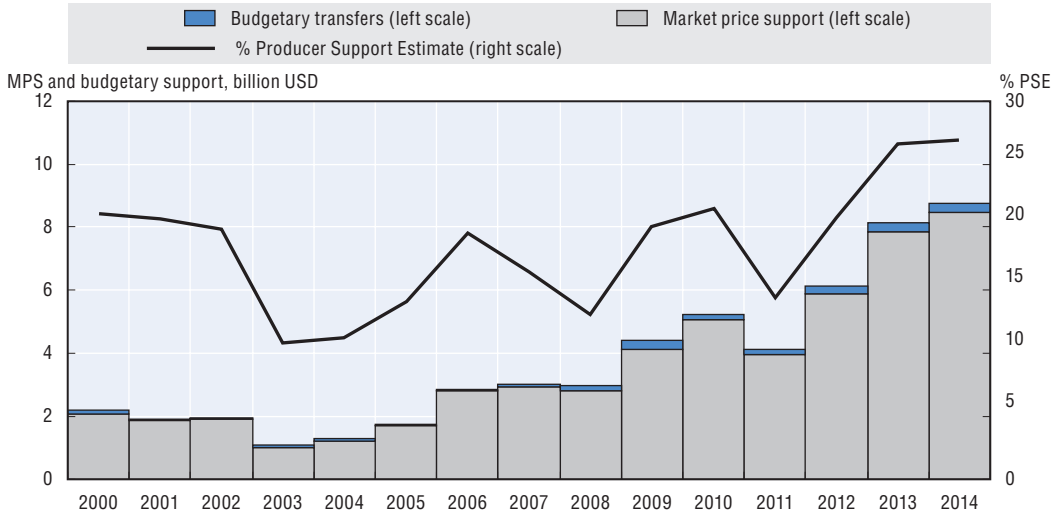
### *Level of producer support*

The **percentage Producer Support Estimate** (%PSE) is the OECD's key indicator to measure the level of support provided to the agricultural sector. It expresses the monetary value of support transfers to agricultural producers as a share of gross farm receipts. Because it is not affected by inflation or the size of the sector, it allows comparisons of the level of support to be made over time and between countries. The level of support is important because it provides insights into the burden that agricultural support policies place on consumers (MPS) and taxpayers (budgetary transfers).

The Philippine's %PSE averaged 25% in the three-year period 2012-14, indicating that one-fourth of gross farm receipts were generated by support policies (Tables 2.10 and 2.11). This represents a slight increase compared to the 2000-02 average of 21%. Over the observed period, the nominal value of support increased from about USD 2 billion in the early 2000s to USD 6-8 billion in 2012-14, but as gross farm revenues (including those from support) increased at almost the same rate, the %PSE increased only marginally (Figure 2.10).

As seen in Figure 2.10, the %PSE has fluctuated markedly between 11% and 27%. These variations are driven almost exclusively by changes in relative levels of domestic and international prices, as measured by MPS. For example, a fall in support in 2008 and again in 2011 was the result of a large increase in international prices for grains, only partly transmitted to the domestic market. Budgetary transfers, the second major component of PSE, also fluctuated, but overall tended to increase, in particular in recent years. However, the share of budgetary transfers in the total PSE averaged just 3.7% during 2000-14, indicating that the bulk of support in the Philippines is provided by transfers from consumers.

Figure 2.10. **Level and composition of Producer Support Estimate in the Philippines, 2000-14**




*Note:* Percentage PSE (%PSE) is the monetary value of support transfers to agricultural producers as a share of gross farm receipts.
*Source:* OECD (2016), "Producer and Consumer Estimates", *OECD Agriculture Statistics Database*.
StatLink http://dx.doi.org/10.1787/888933452497

## Table 2.10. **Estimate of support to agriculture in the Philippines, PHP million**

| | 2000-02 | 2012-14 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|
| **Total value of production (at farm gate)** | **475 034** | **1 317 503** | **1 235 225** | **1 286 910** | **1 430 373** |
| *of which: share of MPS commodities (%)* | *89.2* | *87.9* | *88.3* | *86.7* | *88.7* |
| **Total value of consumption (at farm gate)** | **486 371** | **1 361 050** | **1 274 612** | **1 310 181** | **1 498 357** |
| **Producer Support Estimate (PSE)** | **98 151** | **330 679** | **258 595** | **345 436** | **388 006** |
| Support based on commodity output | 94 657 | 319 705 | 248 804 | 333 369 | 376 941 |
| *Market Price Support*[1] | *94 657* | *319 705* | *248 804* | *333 369* | *376 941* |
| *Payments based on output* | *0* | *0* | *0* | *0* | *0* |
| Payments based on input use | 3 196 | 9 926 | 9 536 | 10 621 | 9 620 |
| *Based on variable input use* | 1 687 | 3 158 | 2 462 | 2 798 | 4 215 |
| *with input constraints* | *0* | *0* | *0* | *0* | *0* |
| *Based on fixed capital formation* | *1 509* | *6 768* | *7 075* | *7 823* | *5 405* |
| *with input constraints* | *0* | *0* | *0* | *0* | *0* |
| *Based on on-farm services* | *0* | *0* | *0* | *0* | *0* |
| *with input constraints* | *0* | *0* | *0* | *0* | *0* |
| Payments based on current A/An/R/I, production required | 65 | 817 | 84 | 1 184 | 1 184 |
| *Based on Receipts / Income* | 0 | 0 | 0 | 0 | 0 |
| *Based on Area planted / Animal numbers* | 65 | 817 | 84 | 1 184 | 1 184 |
| *with input constraints* | 0 | 0 | 0 | 0 | 0 |
| Payments based on non-current A/An/R/I, production required | 0 | 0 | 0 | 0 | 0 |
| Payments based on non-current A/An/R/I, production not required | 0 | 0 | 0 | 0 | 0 |
| *With variable payment rates* | 0 | 0 | 0 | 0 | 0 |
| *with commodity exceptions* | 0 | 0 | 0 | 0 | 0 |
| *With fixed payment rates* | 0 | 0 | 0 | 0 | 0 |
| *with commodity exceptions* | 0 | 0 | 0 | 0 | 0 |
| Payments based on non-commodity criteria | 0 | 0 | 0 | 0 | 0 |
| *Based on long-term resource retirement* | 0 | 0 | 0 | 0 | 0 |
| *Based on a specific non-commodity output* | 0 | 0 | 0 | 0 | 0 |
| *Based on other non-commodity criteria* | 0 | 0 | 0 | 0 | 0 |
| Miscellaneous payments | 232 | 231 | 170 | 262 | 262 |
| **Percentage PSE (%)** | **20.5** | **24.8** | **20.8** | **26.6** | **26.9** |
| **Producer NPC (coeff.)** | **1.29** | **1.34** | **1.27** | **1.38** | **1.38** |
| **Producer NAC (coeff.)** | **1.26** | **1.33** | **1.26** | **1.36** | **1.37** |
| **General Services Support Estimate (GSSE)** | **11 861** | **57 279** | **47 106** | **58 608** | **66 125** |
| Agricultural knowledge and innovation system | 2 694 | 11 250 | 8 587 | 12 070 | 13 095 |
| Inspection and control | 672 | 1 836 | 1 302 | 2 692 | 1 513 |
| Development and maintenance of infrastructure | 7 521 | 36 850 | 30 449 | 36 020 | 44 081 |
| Marketing and promotion | 298 | 1 368 | 1 455 | 1 668 | 982 |
| Cost of public stockholding | 607 | 4 167 | 4 000 | 4 250 | 4 250 |
| Miscellaneous | 69 | 1 808 | 1 313 | 1 909 | 2 203 |
| **Percentage GSSE (% of TSE)** | **10.8** | **14.8** | **15.4** | **14.5** | **14.6** |
| **Consumer Support Estimate (CSE)** | **-103 048** | **-346 075** | **-271 225** | **-354 138** | **-412 862** |
| Transfers to producers from consumers | -105 538 | -336 180 | -259 003 | -357 122 | -392 416 |
| Other transfers from consumers | -7 204 | -25 447 | -21 223 | -17 612 | -37 507 |
| Transfers to consumers from taxpayers | 0 | 0 | 0 | 0 | 0 |
| Excess feed cost | 9 695 | 15 552 | 9 000 | 20 596 | 17 061 |
| **Percentage CSE (%)** | **-21.2** | **-25.3** | **-21.3** | **-27.0** | **-27.6** |
| **Consumer NPC (coeff.)** | **1.30** | **1.36** | **1.28** | **1.40** | **1.40** |
| **Consumer NAC (coeff.)** | **1.27** | **1.34** | **1.27** | **1.37** | **1.38** |
| **Total Support Estimate (TSE)** | **110 011** | **387 959** | **305 701** | **404 044** | **454 131** |
| Transfers from consumers | 112 743 | 361 627 | 280 226 | 374 734 | 429 923 |
| Transfers from taxpayers | 4 473 | 51 778 | 46 698 | 46 922 | 61 715 |
| Budget revenues | -7 204 | -25 447 | -21 223 | -17 612 | -37 507 |
| **Percentage TSE (expressed as share of GDP)** | **3.0** | **3.3** | **2.9** | **3.5** | **3.6** |
| **GDP deflator 2000-02 = 100** | **100** | **163** | **159** | **162** | **167** |

NPC: Nominal Protection Coefficient. NAC: Nominal Assistance Coefficient. A (area planted), An (animal numbers), R (receipts), I (income). MPS commodities for the Philippines are: rice, maize, coconuts, bananas, sugarcane, mango, pineapple, beef and veal, pigmeat, poultry and eggs. Market Price Support is net of producer levies and Excess Feed Cost.

*Source:* OECD (2016), "Producer and Consumer Estimates", *OECD Agriculture Statistics* (database).

StatLink http://dx.doi.org/10.1787/888933452505

## Table 2.11. **Estimate of support to agriculture in the Philippines, USD million**

| | 2000-02 | 2012-14 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|
| **Total value of production (at farm gate)** | **9 733** | **30 594** | **29 250** | **30 316** | **32 216** |
| *of which: share of MPS commodities (%)* | *89.2* | *87.9* | *88.3* | *86.7* | *88.7* |
| **Total value of consumption (at farm gate)** | **9 961** | **31 598** | **30 183** | **30 864** | **33 747** |
| **Producer Support Estimate (PSE)** | **2 014** | **7 667** | **6 123** | **8 137** | **8 739** |
| Support based on commodity output | 1 941 | 7 412 | 5 892 | 7 853 | 8 490 |
| *Market Price Support*[1] | *1 941* | *7 412* | *5 892* | *7 853* | *8 490* |
| *Payments based on output* | *0* | *0* | *0* | *0* | *0* |
| Payments based on input use | 67 | 231 | 226 | 250 | 217 |
| *Based on variable input use* | 35 | 73 | 58 | 66 | 95 |
| *with input constraints* | *0* | *0* | *0* | *0* | *0* |
| *Based on fixed capital formation* | *32* | *158* | *168* | *184* | *122* |
| *with input constraints* | *0* | *0* | *0* | *0* | *0* |
| *Based on on-farm services* | *0* | *0* | *0* | *0* | *0* |
| *with input constraints* | *0* | *0* | *0* | *0* | *0* |
| Payments based on current A/An/R/I, production required | 1 | 19 | 2 | 28 | 27 |
| *Based on Receipts / Income* | 0 | 0 | 0 | 0 | 0 |
| *Based on Area planted / Animal numbers* | 1 | 19 | 2 | 28 | 27 |
| *with input constraints* | 0 | 0 | 0 | 0 | 0 |
| Payments based on non-current A/An/R/I, production required | 0 | 0 | 0 | 0 | 0 |
| Payments based on non-current A/An/R/I, production not required | 0 | 0 | 0 | 0 | 0 |
| *With variable payment rates* | 0 | 0 | 0 | 0 | 0 |
| *with commodity exceptions* | 0 | 0 | 0 | 0 | 0 |
| *With fixed payment rates* | 0 | 0 | 0 | 0 | 0 |
| *with commodity exceptions* | 0 | 0 | 0 | 0 | 0 |
| Payments based on non-commodity criteria | 0 | 0 | 0 | 0 | 0 |
| *Based on long-term resource retirement* | 0 | 0 | 0 | 0 | 0 |
| *Based on a specific non-commodity output* | 0 | 0 | 0 | 0 | 0 |
| *Based on other non-commodity criteria* | 0 | 0 | 0 | 0 | 0 |
| Miscellaneous payments | 5 | 5 | 4 | 6 | 6 |
| **Percentage PSE (%)** | **20.5** | **24.8** | **20.8** | **26.6** | **26.9** |
| **Producer NPC (coeff.)** | **1.29** | **1.34** | **1.27** | **1.38** | **1.38** |
| **Producer NAC (coeff.)** | **1.26** | **1.33** | **1.26** | **1.36** | **1.37** |
| **General Services Support Estimate (GSSE)** | **244** | **1 328** | **1 115** | **1 381** | **1 489** |
| Agricultural knowledge and innovation system | 56 | 261 | 203 | 284 | 295 |
| Inspection and control | 14 | 43 | 31 | 63 | 34 |
| Development and maintenance of infrastructure | 155 | 854 | 721 | 849 | 993 |
| Marketing and promotion | 6 | 32 | 34 | 39 | 22 |
| Cost of public stockholding | 12 | 97 | 95 | 100 | 96 |
| Miscellaneous | 1 | 42 | 31 | 45 | 50 |
| **Percentage GSSE (% of TSE)** | **10.8** | **14.8** | **15.4** | **14.5** | **14.6** |
| **Consumer Support Estimate (CSE)** | **-2 113** | **-8 021** | **-6 423** | **-8 342** | **-9 299** |
| Transfers to producers from consumers | -2 167 | -7 795 | -6 133 | -8 413 | -8 838 |
| Other transfers from consumers | -148 | -587 | -503 | -415 | -845 |
| Transfers to consumers from taxpayers | 0 | 0 | 0 | 0 | 0 |
| Excess feed cost | 202 | 361 | 213 | 485 | 384 |
| **Percentage CSE (%)** | **-21.2** | **-25.3** | **-21.3** | **-27.0** | **-27.6** |
| **Consumer NPC (coeff.)** | **1.30** | **1.36** | **1.28** | **1.40** | **1.40** |
| **Consumer NAC (coeff.)** | **1.27** | **1.34** | **1.27** | **1.37** | **1.38** |
| **Total Support Estimate (TSE)** | **2 259** | **8 995** | **7 239** | **9 518** | **10 228** |
| Transfers from consumers | 2 315 | 8 382 | 6 636 | 8 828 | 9 683 |
| Transfers from taxpayers | 91 | 1 200 | 1 106 | 1 105 | 1 390 |
| Budget revenues | -148 | -587 | -503 | -415 | -845 |
| **Percentage TSE (% of GDP)** | **3.0** | **3.3** | **2.9** | **3.5** | **3.6** |
| **GDP deflator 2000-02 = 100** | **100** | **163** | **159** | **162** | **167** |

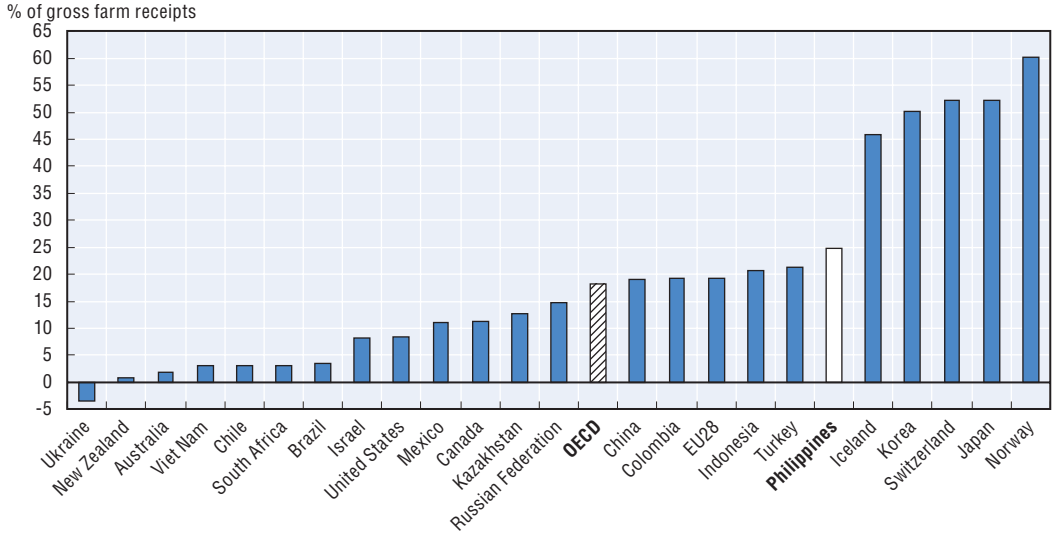
NPC: Nominal Protection Coefficient. NAC: Nominal Assistance Coefficient. A (area planted), An (animal numbers), R (receipts), I (income). MPS commodities for the Philippines are: rice, maize, coconuts, bananas, sugarcane, mango, pineapple, beef and veal, pigmeat, poultry and eggs. Market Price Support is net of producer levies and Excess Feed Cost.

*Source:* OECD (2016), "Producer and Consumer Estimates", *OECD Agriculture Statistics* (database).

StatLink http://dx.doi.org/10.1787/888933452514

The average level of support in the Philippines is **higher than the OECD average** of 18% and the highest among emerging economies over 2012-14 (Figure 2.11). Compared to the other Asian countries in the sample, the level of support to producers in the Philippines is much lower than in Japan (52%) and Korea (50%), both high-income net importers of food products; is relatively close to Indonesia (21%) and China (19%), middle-income net importers of food; but more than eight times higher than in Viet Nam (3%), a strongly export-oriented and competitive for a wide range of crops (OECD, 2015).

Figure 2.11. **Producer Support Estimate in the Philippines and selected countries, 2012-14**




1. The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.
2. The OECD total does not include the non-OECD EU member states.
*Source:* OECD (2016), "Producer and Consumer Estimates", *OECD Agriculture Statistics Database*.
StatLink http://dx.doi.org/10.1787/888933452523

### *Composition of producer support by policy category*

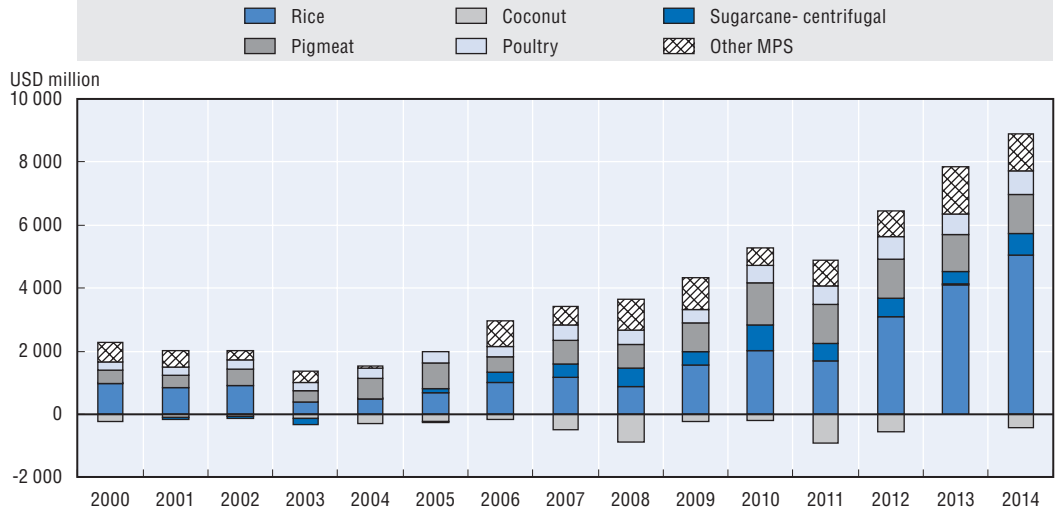
In addition to the level of support, it is also important to analyse the way in which that support is provided to producers. The **composition of support** shows how support is provided and thus the impact on the agricultural sector and on the distribution of benefits across society. For example, market price support can have a large effect on production and trade, but it imposes additional and regressive costs on domestic consumers, is not effective in improving farm income and can have negative effects on the environment. On the other hand, income support not based on current commodity production is much more effective at improving farm income with fewer spill-over effects. Policies that directly target non-commodity criteria such as landscape elements, environmental performance or traditional breeds of animals are also typically more effective at reaching these societal objectives. While targeted policies are likely to be more politically sustainable as they can be clearly explained, higher implementation costs (the costs associated with designing, implementing, monitoring and evaluating policy measures) make the move towards targeted policies more challenging (van Tongeren, 2008; Martini, 2011).

**MPS is the dominant component** of producer support in the Philippines. Its aggregate value is the outcome of a positive price gap for a majority of the commodities indicating price support (positive MPS) and implicit taxation through negative price gaps for few other commodities (a negative MPS) (Figure 2.12). Annual variations depend on movements in world prices, domestic prices and exchange rates, as well as changes in production levels. In 2011-14, the nominal value of MPS almost doubled due to a widening of the price gap between domestic and border prices (domestic prices increased and border prices decreased) and the ongoing appreciation of the PHP (Chapter 1).

The level and fluctuations of **MPS for rice** have a major impact on the level and changes of the total MPS. This is due to the high share of rice in the total value of agricultural production (at about one-fourth) and the highly protective measures separating domestic prices for rice from those on international markets. In particular, in 2012-14 rice import controls through the state trading enterprise (NFA) protected rice producers from the decrease in international rice prices. As a result, the share of rice MPS in total MPS increased to 55% in 2012-14 (Figure 2.12).

Sugarcane and animal products are the other agricultural sectors that receive substantial market price support. Both sectors are protected through high tariffs. Production and trade of sugar are also regulated by the Sugar Regulatory Administration. The price gap for coconuts was negative throughout the period, due mainly to poorly functioning marketing channels and poor infrastructure.

Figure 2.12. **Level and composition of Market Price Support in the Philippines, 2000-14**




*Source:* OECD (2016), "Producer and Consumer Estimates", *OECD Agriculture Statistics Database*.

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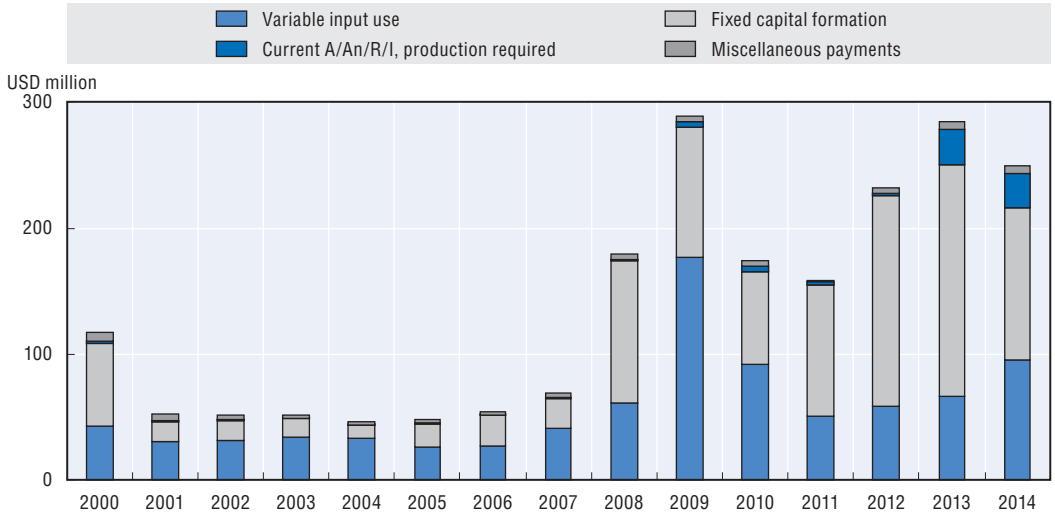
Budgetary support to agricultural producers has increased from about USD 50 million annually in 2001-07 to USD 250 million in 2014. As a share of gross farm receipts, it has increased from about 0.5% in the early 2000s to around 0.8% in 2012-14. Budgetary expenditures on agriculture surged in 2008-09, when the country was hit by the global food price crisis (Figure 2.13). Over the whole period, budgetary support has been primarily provided in the form of payments based on input use. During the 2000s, expenditures were mainly allocated to subsidising use of variable inputs, such as high yielding seeds, fertilisers

and other agricultural inputs. From 2011 onwards, the importance of subsidies for farm mechanisation strongly increased, both in absolute and relative terms. During 2013-14, support to insurance schemes also increased considerably.

Figure 2.13. **Level and composition of budgetary transfers in the Philippines, 2000-14**




*Note:* A (area planted), An (animal numbers), R (receipts), I (income).
*Source:* OECD (2016), "Producer and Consumer Estimates", *OECD Agriculture Statistics Database*.
StatLink http://dx.doi.org/10.1787/888933452543

### *Commodity profile of producer support*

**Producer Single Commodity Transfers** (SCT) is an indicator of the extent to which agricultural policies are commodity-specific, or the flexibility that policies allow producers in their choices of product mixes. For example, payments designated for a specific commodity require recipient farmers to produce that commodity. Alternatively, payments may be provided for any commodity in a designated group (for example, any crop within a cereal group), or simply to any commodity without distinction. The latter payments give freedom to those who receive support to define their production mix, and producers become more responsive to market signals. The SCT corresponds to the first type of support and includes MPS and payments provided for the production of only a specified individual commodity. The SCT can be expressed in relative terms as a percentage of gross receipts for a given commodity. A figure of 33%, for example, indicates that the value of transfers that are specific to that commodity is equivalent to one-third of gross farm receipts for that commodity.

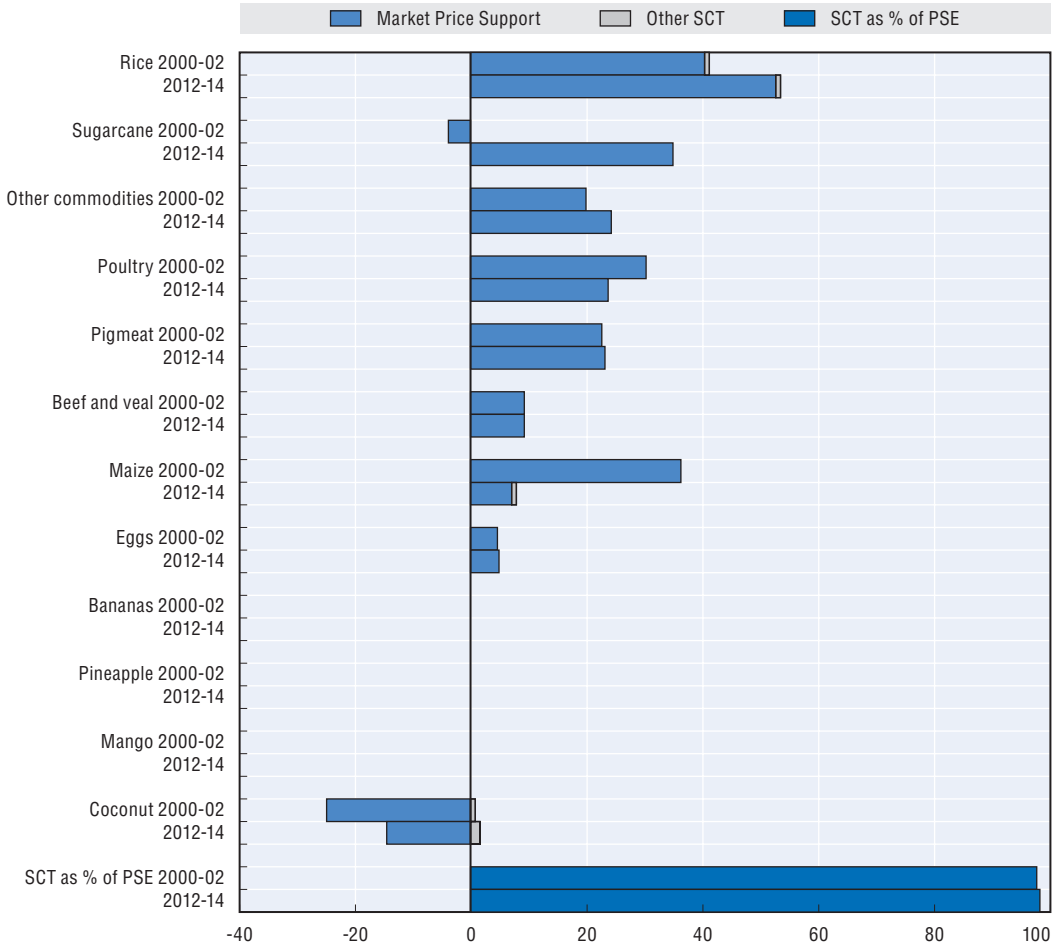
Overall, commodity-specific transfers dominate in the Philippines, as shown by the 98% share of SCT in total PSE during the whole period (Figure 2.14). Such policies limit the flexibility of farmers in their production decisions. Producer SCT as a share of commodity gross farm receipts (%SCT) is **highest for rice**, with the value of transfers representing more than half of gross farm receipts in 2012-14. The high %SCT for rice reflects the government's rice self-sufficiency policy, which is mainly implemented through the state trading agency with market price support as the main policy support measure. Rice producers have also been eligible for payments based on input use (Other SCT). During the period under review,

the %SCT for rice has increased from 40% in 2000-02 to 53% in 2012-14, indicating the increasing efforts of the government to provide protection to rice farmers.

Sugarcane %STC is the second highest, at 35% in 2012-14. Similarly to rice, the %SCT for sugarcane increased considerably between 2000-02 and 2012-14 due to increased transfers through market price support. For poultry, the %SCT has decreased from 30% in 2000-02 to 24% in 2012-14; the %SCT for pigmeat remained stable at around 23% of commodity gross farm receipts over the same period. The %SCT for maize fell quite substantially from 36% in 2000-02 to 7% in 2012-14.

The %STC for coconuts was constantly negative in 2000-14. The negative SCT means that producers receive prices that are below world prices. In the case of the Philippines, as for many other developing and emerging economies, it is not correct to interpret the implicit taxation of these products exclusively as a policy outcome. Particularly for the coconut sector, poor market infrastructure (such as poor physical infrastructure and lack of access to formal credit) can impede market adjustment and therefore contribute to the implicit taxation of producers (Box 1.2).

Figure 2.14. **Producer SCTs by commodity in the Philippines, 2000-02 and 2012-14**



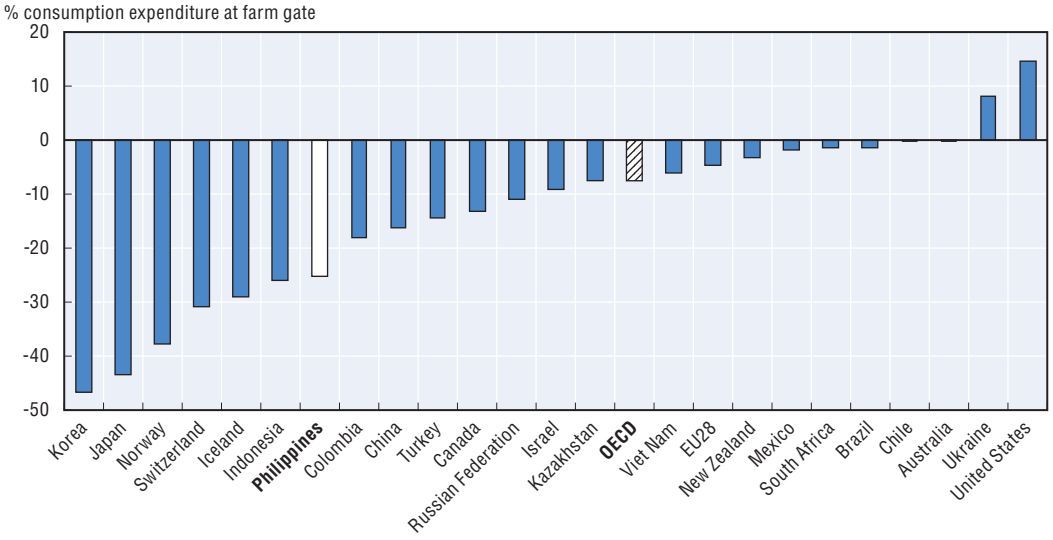

*Note:* Commodities are ranked according to 2012-14 levels. SCT: Single Commodity Transfers.
*Source:* OECD (2016), "Producer and Consumer Estimates", *OECD Agriculture Statistics Database*.
StatLink http://dx.doi.org/10.1787/888933452556

### *Support to consumers of agricultural products*

The Consumer Support Estimate (CSE) is a related indicator measuring the **cost to consumers** arising from policies that support agricultural producers by raising domestic prices. In the OECD methodology, the consumer is understood as the first buyer of these products. A negative CSE indicates that consumers are paying more than they would in comparison to border prices (an implicit tax); when it is positive, consumers are able to purchase the product more cheaply on domestic market (an implicit subsidy). In the majority of countries monitored by the OECD, consumers are taxed but may be partly compensated, e.g. through direct budgetary subsidies to processors or various forms of food assistance.

Similar to the PSE, the CSE can be expressed in relative terms as a percentage of consumption expenditures (%CSE). In 2012-14, Philippine consumers were implicitly taxed through agricultural policies at a **relatively high level**, with a %CSE of -25%; this indicates that policies to support farm prices increased consumption expenditures by 25% on aggregate (Figure 2.15). The implicit tax on consumers is much higher than the OECD average of 8%. Compared to other countries, the %CSE in the Philippines is lower than in Korea, Japan, Norway, Switzerland and Iceland, and at about the same level as in Indonesia.

Figure 2.15. **Consumer Support Estimate in the Philippines and selected countries, 2012-14**



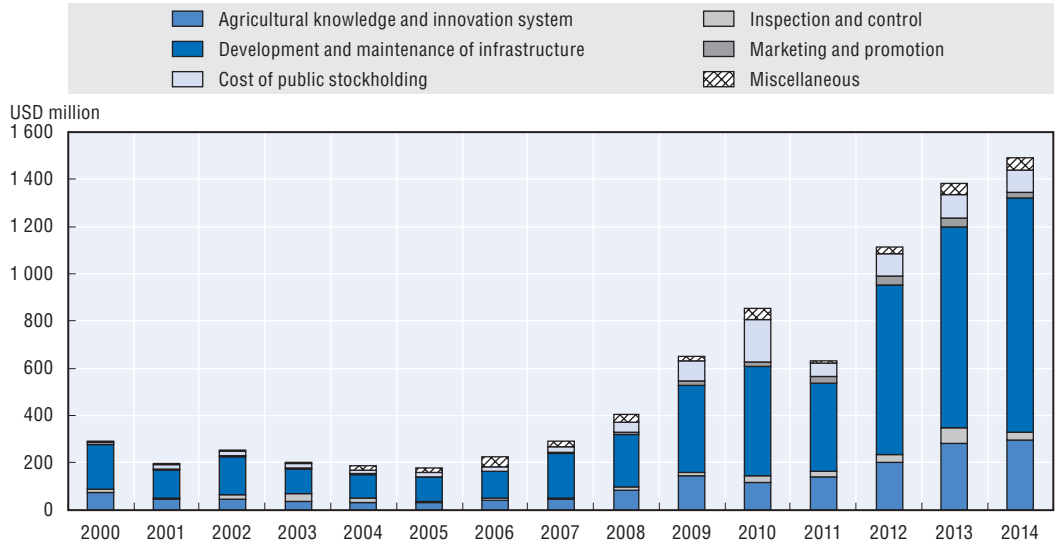

1. The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.
2. The OECD total does not include the non-OECD EU member states.
*Source:* OECD (2016), "Producer and Consumer Estimates", *OECD Agriculture Statistics Database*.
StatLink http://dx.doi.org/10.1787/888933452569

### *Support to general services for agriculture*

In addition to support provided to individual producers, the agricultural sector is assisted through the financing of activities that provide general benefits, such as agricultural research and development, training, inspection, marketing and promotion, and public stockholding. The **General Services Support Estimate (GSSE)** indicator measures this support. The provision of common, as opposed to individual, benefit is what distinguishes the general services support from that measured by the PSE.

In the Philippines, expenditure on general services started to rise sharply at the end of the 2000s (Figure 2.16). In absolute terms, it rose more than five-fold from USD 245 million in 2000-02 to USD 1 329 million in 2012-14. The most important GSSE category is the development and maintenance of infrastructure, of which a major share is investments in irrigation systems. Over 2000-13, investment in irrigation represented about 80% of expenditure on infrastructure, but fell to 50% in 2014. The remaining expenditure on infrastructure has mostly been on farm-to-market roads. Expenditure on agricultural knowledge and innovation system are the second most important GSSE category. In absolute terms, they have grown steadily along with the increase in total expenditure on GSSE, thus their share in total GSSE has been at around 20% throughout the period. Following the 2008-09 food crisis, expenditure on public stockholding increased substantially, but its relative importance subsequently declined (Figure 2.16).

Figure 2.16. **Level and composition of General Services Support Estimate in the Philippines, 2000-14**




*Source:* OECD (2016), "Producer and Consumer Estimates", *OECD Agriculture Statistics Database*.

StatLink http://dx.doi.org/10.1787/888933452579

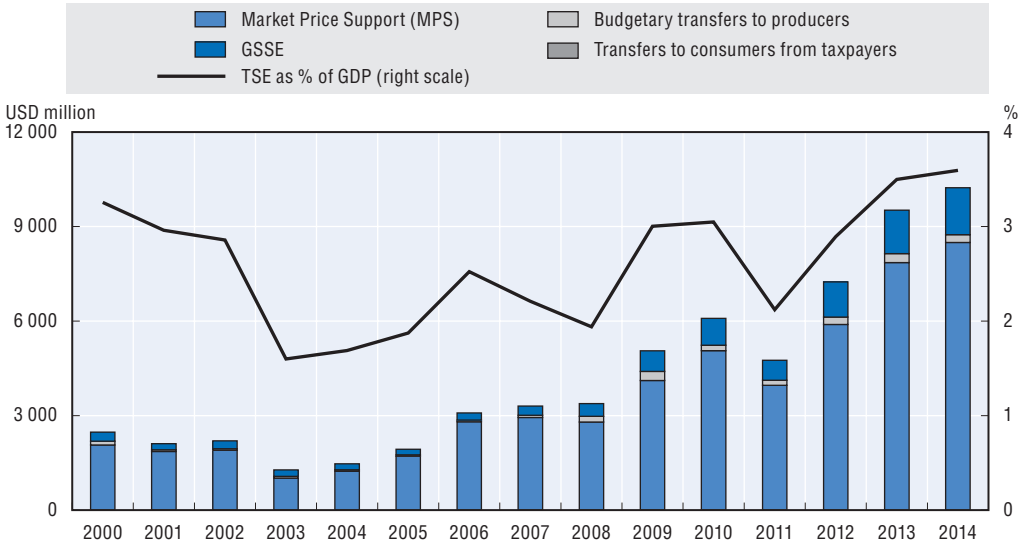
The share of GSSE in total support (%GSSE) indicates the relative importance of these transfers within support to the agricultural sector. During the period under review, %GSSE in total support rose from 11% in 2000-02 to 15% in 2012-14 (Table 2.10), which is slightly above the OECD average of 14% in 2012-14. The growing share of support that is provided to the agricultural sector as a whole rather than to individual producers is a positive phenomenon, but more needs to be done to re-orient agricultural support spending to forms that can bring benefits to both producers and consumers, with potentially smaller production and trade distortions.

### *Support to the agricultural sector as a whole*

The **Total Support Estimate (TSE)** is the broadest indicator of support, representing the sum of transfers to agricultural producers individually (PSE) and collectively (GSSE), and direct budgetary transfers to consumers. Expressed as a percentage of GDP, the %TSE provides an indication of the cost that support to the agricultural sector places on the overall economy. Its value depends on the degree to which the agricultural sector is supported in a country, the size of this sector and its importance relative to the overall economy.

The Philippine's TSE averaged PHP 388 billion (USD 9 billion) per year in 2012-14, representing 3.3% of GDP. Over 2000-14, the %TSE fluctuated at around 2-3%, mainly because of variations in MPS (Figure 2.17). The largest fluctuations, above 3%, were for the %TSE at the beginning of the 2000s and in 2012-14. The falls in the %TSE in 2008 and 2011 were caused by a fall in MPS resulting from narrowing the price gap between domestic and international prices.

Figure 2.17. **Level and composition of Total Support Estimate in the Philippines, 2000-14**

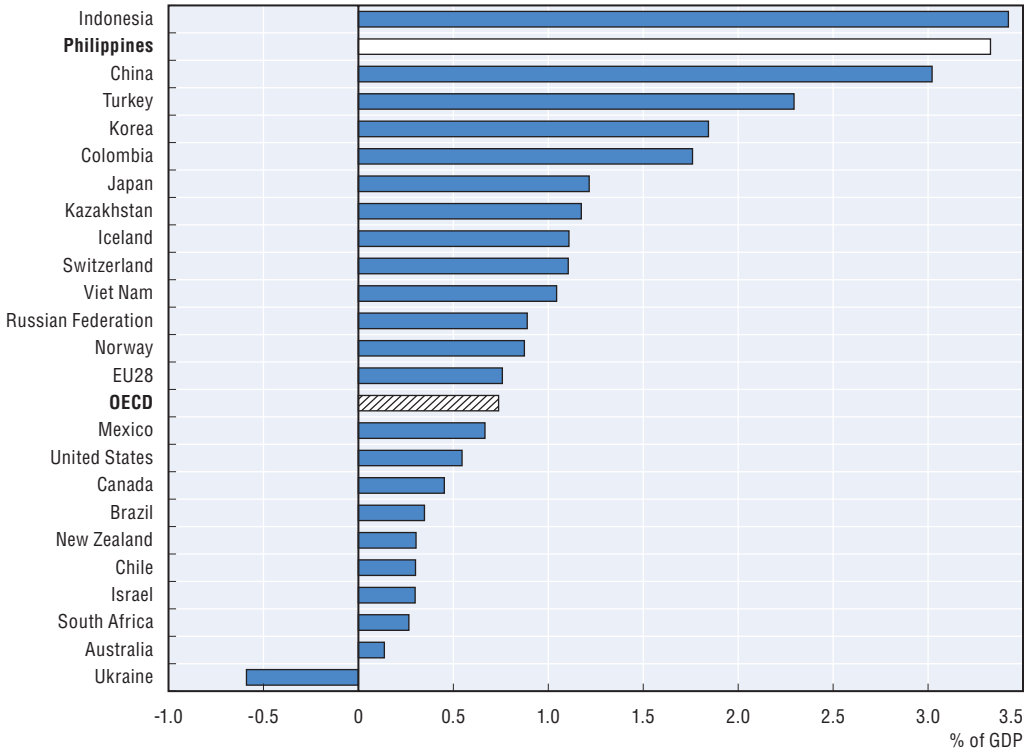



*Note:* GSSE: General Services Support Estimate; TSE: Total Support Estimate.
*Source:* OECD (2016), "Producer and Consumer Estimates", *OECD Agriculture Statistics Database*.
StatLink http://dx.doi.org/10.1787/888933452582

The level of total support to the Philippine agricultural sector in 2012-14, equivalent to 3.3% of GDP, is almost **five times the OECD average** of 0.7% (Figure 2.18). Only Indonesia has a %TSE higher than the Philippines, at 3.4%. This high %TSE shows that for developing countries with a large agricultural sector, the cost of agricultural support to the economy can be relatively high. It also shows the potential burden of the current policy mix on consumers and taxpayers and highlights the need to ensure that this support is effectively used to achieve policy objectives.

While the %TSE provides a good assessment of the burden agricultural support places on the economy, it is important to indicate that in emerging economies support is dominantly provided through market price support and that the relative importance of budgetary support for countries' agricultural sector is relatively small. Figure 2.19 depicts a ratio of all types of budgetary support to agriculture, both payments provided to farmers individually and to the agricultural sector as a whole (GSSE), to agricultural value added. It shows that in the Philippines this ratio is at just 0.05, slightly higher than in Indonesia at 0.03, but almost five times lower than the OECD average at 0.23. The highest ratio of budgetary support to agricultural value added is in Switzerland, reaching 0.94 in 2012-14.

Figure 2.18. **Total Support Estimate in the Philippines and selected countries, 2012-14**

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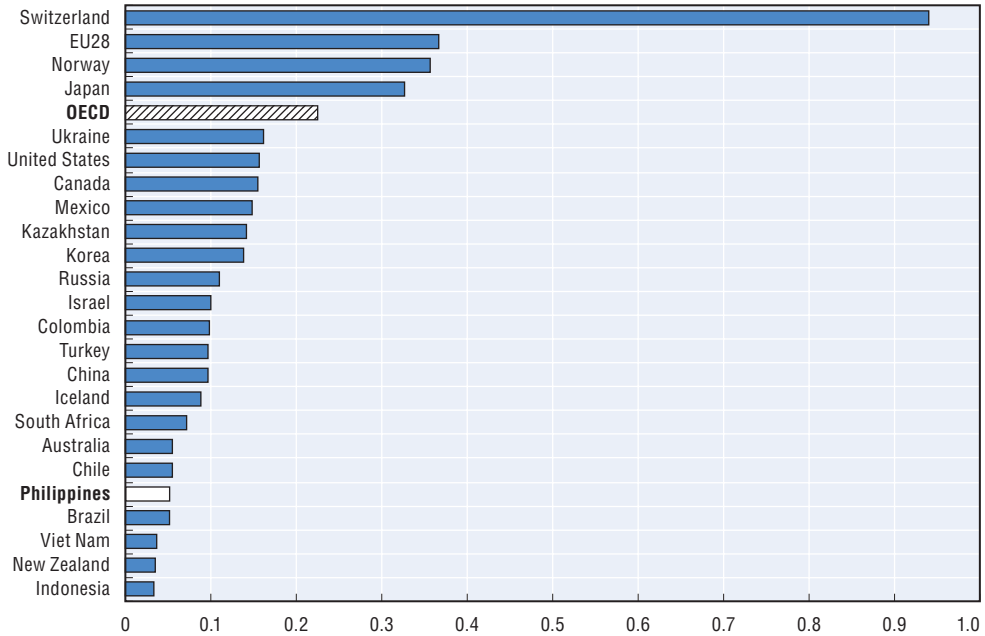
2. The OECD total does not include the non-OECD EU member states.
*Source:* OECD (2016), "Producer and Consumer Estimates", *OECD Agriculture Statistics Database*.

StatLink http://dx.doi.org/10.1787/888933452597

Figure 2.19. **Budgetary support to agriculture relative to agricultural value added in the Philippines and selected countries, 2012-14**

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*Source:* OECD (2016), "Producer and Consumer Estimates", *OECD Agriculture Statistics Database*.

StatLink http://dx.doi.org/10.1787/888933452603

## 2.6. Summary

Attaining **food self-sufficiency**, in particular in rice production, has been the Philippines' key agricultural policy objective over the past decades. In recent years, in addition to increasing the sector's productivity, emphasis has been placed on linking agriculture with industry and service sectors, food safety as well as improving the sector's resilience to risks, including those triggered by climate change.

The Agricultural and Fisheries Modernisation Act adopted in 1997 integrates all agricultural policy measures into one framework and remains the most important law for the agricultural sector. However, the design and implementation of agricultural policies is fragmented among several institutions. The Department of Agriculture is the main agency overseeing key agricultural policy issues. The Department of Agrarian Reform is responsible for supporting the agrarian reform beneficiaries. The Department of Environment and Natural Resources has regulatory power over natural resources and land. Several policy measures are implemented by Local Government Units. Government-Owned and Controlled Corporations also implement policies in selected areas, with the National Food Authority and National Irrigation Administration being the most influential.

**Price support, tariff protection, input subsidies and expansion of the irrigated area** have traditionally been the main policy instruments to achieve food self-sufficiency. Tariff protection remains the key tool of trade policy and until recently remained at a high level. Trade liberalisation has mainly occurred within regional trade agreements, particularly the ASEAN Free Trade Area. Credit is provided under the umbrella of the Agriculture Modernisation Credit and Financing Program and is targeted mostly to small-scale farmers. Crop insurance has become one of the key tools to increase the sector's resilience to risks. The area covered by various insurance schemes has increased substantially over recent years.

The **level of support to producers** as measured by the %PSE (Producer Support Estimate as a share of gross farm revenues) averaged 25% in 2012-14: above the OECD average (18%) and close to the level of support provided to producers in China (19%) and Indonesia (21%). Over the period 2000-14 the level of support fluctuated markedly, ranging between 11% and 27%, driven by changes in relative levels of domestic and international prices. Budgetary transfers fluctuated and remained low, but have tended to increase, in particular in recent years.

Producer support in the Philippines is based predominantly on **market price support**, one of the most distorting forms of support. The high level of MPS has the effect of taxing consumers and the food processing industry, as measured by the %CSE (Consumer Support Estimate as a share of consumption expenditures). In 2012-14, the Philippine's %CSE averaged -25% which indicates that policies to support farm prices increased consumption expenditures by 25% on aggregate.

**Budgetary support** has been primarily provided in the form of payments based on input use. During the 2000s, expenditures were mainly allocated to subsidise use of variable inputs, such as high-yielding seeds, fertilisers and other agricultural inputs. Since 2011, input subsidies for seeds and fertilisers have partly been replaced by roll-over schemes to encourage adoption of high-yielding seed varieties and subsidies for farm mechanisation have strongly increased, both in absolute and relative terms.

The highest level of support is provided to **rice and sugar producers**. The National Food Authority is the regulatory body for the rice market. Its main tasks are price stabilisation and food security through rice procurement, import controls and buffer stocking. Price stabilisation includes ensuring low and stable prices for consumers and keeping the farm

price of paddy rice above the market price. The Sugar Regulatory Administration manages sugar production quotas and foreign trade. The value of transfers from consumers and taxpayers to rice producers represented more than half of their gross farm receipts in 2012-14, while transfers to sugarcane producers represented slightly more than a third. Transfers to coconut producers were negative over 2000-14, meaning that the producers received prices below world prices.

Expenditure on **general services t**o agriculture started to rise sharply at the end of the 2000s. The most important category is development and maintenance of infrastructure, in particular expansion of irrigation systems. Over 2000-14, about 36% of the annual budgetary expenditure to support agriculture was dedicated to investments in irrigation, almost entirely to the benefit of rice producers. Budgetary spending on infrastructure investments has increased recently, particularly to farm-to-market roads and post-harvest facilities. However, the extension system has long suffered from low financing and fragmented structure, as well as a weak link to technology developers.

**Total support** to agriculture, both to farmers individually and to general services to agriculture, is high relative to the Philippines' Gross Domestic Product and is comparable to that in Indonesia and China, but much higher than the OECD average.

### *Notes*

1. In 2014, Office of the Presidential Assistant for Food Security and Agricultural Modernization (OPAFSAM), a cabinet level position, was created to oversee the four largest agencies responsible for agricultural policy implementation that were previously under the DA.
2. The consultative bodies of PCAF for private sector participation include Agriculture and Fishery Councils at regional, provincial and municipal levels. There are 16 Regional Agricultural and Fishery Councils, 82 Provincial Agricultural and Fishery Councils, 19 Independent Component City Agricultural and Fishery Councils and Highly Urbanised City Councils, and 1 611 Municipal Agricultural and Fishery Councils and City Agricultural and Fishery Councils. To reflect sector-specific concerns, National Sectoral Committees serve as the venue for consultation between the DA and other agencies, national industry groups and civil society organisations. At present, there are eight National Sectoral Committees: Agricultural and Fishery Mechanization, Climate Change, Commercial Crops, Fisheries and Aquaculture, Food Staples, Fruits and Vegetables, International Trade, and Poultry, Livestock and Feed Crops.
3. The price of milled rice was deregulated; importation of wheat and distribution of flour was opened to private sector. The importation and distribution of fertilisers were also opened to private sector (SEPO, 2006).
4. Local Government Code, 1991, RA 7160.
5. The Agrarian Reform Fund was created in 1972 to support agrarian reform.
6. Executive Order No. 398 from 31 January 1997 and Executive Order No. 22 from 9 September 1998.
7. In 2015, the drying and delivery incentives were 0.20 PHP/kg of paddy rice (0.004 USD/kg), bringing the paddy rice price for the individual farmer up to PHP 17.40/kg (0.38 USD/kg). The co-operative incentive fee was 0.3 PHP/kg of paddy rice (0.007 USD/kg), which meant that farmers' groups were able to receive PHP 17.70/kg of paddy rice (0.39 USD/kg).
8. Executive Order No. 892.
9. DAR is involved in monitoring only those block farms where the agrarian reform beneficiaries are participating.
10. The rice crisis resulted from poor weather, pest infestation in 1971 and the Great Central Luzon flooding in 1972 that reduced rice output by 17%.
11. The government paid 50% of the actual market price of the rice seeds upfront. Farmers paid half of the price in cash and repaid the government the remainder after the harvest. When the farmer paid fully in cash, the price was lowered. The plant-now-pay-later scheme was abolished in 2005 as the payment rates after harvest remained very low.

12. Initial budgetary allocations on the FIELDS programme were as follows: provision of subsidised fertiliser and micronutrients, PHP 0.5 billion (USD 11 million); rehabilitation and restoration of irrigation facilities, PHP 6 billion (USD 135 million); farm-to-market roads and other rural infrastructure, PHP 6 billion (USD 135 million); extension, education and training, and research and development, PHP 5 billion (USD 113 million); agricultural credit, PHP 15 billion (USD 338 million); post-harvest facilities, PHP 2 billion (USD 45 million); hybrid and certified seed production and subsidy, PHP 9.2 billion (USD 208 million) (Balisacan et al., 2010).
13. High-Value Crops Development Act was adopted already in 1995 (RA 7900). The Act lists a number of incentives for farmers of high value crops: distribution of good seeds and planting materials, crop insurance, credit assistance, credit guarantee, market development and technical assistance, post-harvest facilities. Budgetary spending on High Value Crops Development Program has increased more than twofold since 2008.
14. Cash for work program where each farmer is paid PHP 20 (USD 0.44) per seedling sown in his nursery and another PHP 20 (USD 0.44) after it is planted and grown in the farm.
15. RA No 10 601.
16. About 9% of irrigated area is operated by other government-assisted irrigation systems.
17. The Guidelines include: non-participation of government non-financial agencies in the implementation of credit programmes; government financial institutions to be the main vehicle in implementation of government credit programmes; adoption of market-based financial and credit policies; increased participation of private sector in the delivery of financial services.
18. Section 109 of RA 8435.
19. Amendment of the AFMA (RA 9281).
20. Section 109 of the Tax Code (RA 8424).
21. Much more effective in this respect is a conditional cash transfer programme called the Pantawid Pamilyang Pilipino Program (Pantawid Pamilya) launched in 2007 and gradually rolled out since 2008. It is a highly successful programme and currently provides financial grants to 4.4 million poor families with children 0-18 years across the country, subject to compliance with education and health requirements related to their children (Hayakawa et al., 2015).
22. WTO document G/SPS/N/PHL series.
23. DA AO No. 9/2010, Department of Agriculture Administrative Order Amending DA AO No. 8 series 2009, "Rules and Regulations Governing The Importation of Agricultural and Fish and Fishery/Aquatic Products, Fertilizers, Pesticides and Other Agricultural Chemicals, Veterinary Drugs and Biological Products Into the Philippines".
24. DOST-DA-DENR-DOH-DILG Joint Department Circular No. 1, series of 2016 on Rules and Regulations for the Research and Development, Handling and Use, Transboundary Movement, Release into the Environment, and Management of Genetically-Modified Plant and Plant Products Derived from the Use of Modern Biotechnology.
25. In WTO parlance, these kinds of subsidies are referred to as "amber box". Based on a traffic light analogy, this refers to support that is trade-distorting and subject to commitments to phase-out over time, as opposed to "green box" measures which were deemed to be minimally trade distorting and not subject to similar reduction commitments.
26. EO No. 894, 2010, Tariff Commission of the Philippines.

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# ANNEX 2.A1

# *Policy tables*

Table 2.A1.1. **Major laws affecting agro-food sector**

| Statute | Title | Objectives |
|---|---|---|
| RA 10659, 2015 | An Act Promoting and Supporting the Competitiveness of the Sugarcane Industry and for Other Purposes | The Act aims to promote the competiveness of the sugarcane industry, improve incomes of farmers and farm workers through productivity improvement programmes such as block farming, farm support programmes, preferential credit, farm mechanisation, research and development, infrastructure support, sugar supply monitoring, classification and regulation of the supply of sugar and 0% VAT on refined sugar for exports. |
| RA 10 611, 2013 | Food Safety Act | The act aims to strengthen the food safety regulation system, to protect consumer health and facilitate market access of local foods and food products. |
| RA 10601, 2012 | An Act Promoting Agricultural and Fisheries Mechanisation Development in the Country | The Act aims to develop and promote appropriate agricultural machinery and other agricultural mechanisation technologies to bring about agricultural mechanisation in the countryside, to enhance farm productivity and efficiency in order to achieve food security and safety and increase farmers' income. |
| RA 10068, 2010 | An Act Providing for the Development and Promotion of Organic Agriculture in the Philippines and For Other Purposes | The law intends to promote, disseminate, develop and implement organic agriculture in the country. It provides incentives to farmers engaged in organic agriculture. |
| RA 10000, 2010 | An Act Providing for an Agriculture and Agrarian Reform Credit and Financing System through Banking Institutions | The law enhances access of the rural agricultural sector to financial services and programs. It mandates all banking institutions 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 be made for agrarian reform beneficiaries. Further, the law expands modes of compliance to enhance the sector's absorptive capacity and maximise compliance. |
| RA 9729, 2009 | Climate Change Act | The law creates the Climate Change Commission, which serves as the sole policy making body of the government tasked to co-ordinate, monitor and evaluate the programmes and action plans of the government relating to climate change. |
| RA 9700, 2009 | Comprehensive Agrarian Reform Program Extension with Reform Law (CARPER) | The law provides augmentation of funds to accomplish the final acquisition and distribution of all remaining un-acquired and undistributed agricultural lands. |
| RA 9367, 2006 | Biofuels Act | The law aims to ensure the availability of alternative and renewable clean energy without detriment to the natural ecosystem, biodiversity and food reserves of the country. |
| RA 9296, 2004 | An Act Strengthening the Meat Inspection System in the Country, Ordaining for this Purpose a Meat Inspection Code of the Philippines and for Other Purposes | The law strengthens the National Meat Inspection Commission into the National Meat Inspection Service (NMIS) which performs functions related to all matters relating to meat and meat product inspection and meat hygiene. |
| RA 9281, 2004 | An Act to Strengthen Agriculture and Fisheries Modernisation in the Philippines by Extending the Effectivity of Tax Incentives and Its Mandated Funding Support, Amending for this Purpose Sections 109 and 112 of Republic Act 8435 | The Act re-establishes the duty-free importation of agricultural inputs, equipment and machinery up to 2015. It provides for continuous funding of at least PHP 17 billion (USD 303 million) annually for the implementation of agriculture and fisheries modernisation programmes. |
| RA 9168, 2004 | Philippine Plant Variety Protection Act | The Act seeks to institutionalise a *sui generis* system of intellectual property rights protection for plant varieties and create the National Plant Variety Protection Board. The law encourages research and investment in plant breeding and at the same time ensure the availability of high yielding varieties that will increase incomes of farmers. |
| RA 9147, 2001 | Wildlife and Resources Conservation and Protection Act | The Act strengthens the country's regulation on bio-prospecting. It also includes provision on prior informed consent from indigenous communities as a requisite for bio-prospecting. |

Table 2.A1.1. **Major laws affecting agro-food sector** *(cont.)*

| Statute | Title | Objectives |
|---|---|---|
| RA 8800, 2000 | Safeguard Measures Act | The law puts in place a special safeguard mechanism allowing the imposition of additional duties or quantitative restrictions whenever volumes or import prices of tariffied agricultural products with the SSG designation exceed their respective trigger levels as provided in the WTO Agreement on Agriculture. |
| RA 8752, 1999 | Anti-Dumping Act | The law provides protection to Philippine domestic industry which is or is likely to be materially injured by the dumping of articles imported into or sold in the Philippines. |
| RA 8751, 1999 | Countervailing Duties Act | The law aims to protect domestic industries from unfair trade practice of employing subsidies on a country's export products.<br>The Act aims to provide a better mechanism for implementing countervailing duties and align such mechanism without WTO commitments. |
| RA 8532, 1998 | Strengthening the Comprehensive Agrarian Reform Law | The Act provides augmentation fund for the CARP. |
| RA 8485, 1998 | Animal Welfare Act | The Act promotes the welfare of all animals in the Philippines by supervising and regulating the establishment and operations of all facilities utilised for breeding, maintaining, keeping, treating or training of all animals for either for trade or household purposes. |
| RA 8435, 1997 | Agriculture and Fisheries Modernisation Act | AFMA aims to modernise the agriculture and fisheries sectors by transforming these sectors from a resource-based to a technology-based industry. The Act requires identification of strategic agricultural and fisheries development zones; formulation of an agriculture and fisheries modernisation plans; and provisions of funding for the following support services: irrigation, post-harvest facilities and rural infrastructure, credit, research, marketing and information, training and education, capacity building for LGUs and FOs, and duty-free incentives for the importation of agricultural inputs, equipment, and machinery. The Act grants duty-free imports of agricultural inputs for a period of five years. |
| RA 8178, 1996 | Agricultural Tariffication Act | The Act replaces quantitative restrictions on agricultural products, except rice, with tariffs and creates the ACEF. The law employs the use of tariffs in lieu 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. An equitable and transparent mechanism for allocating the Minimum Access Volume (MAV) of agricultural products shall be developed and established. The proceeds of funds from the MAV shall be used for ACEF. |
| RA 8048, 1995 | Coconut Preservation Act | The Act provides for the regulations for the cutting of coconut trees, their replenishment; and penalties. |
| RA 7900,1995 | High Value Crops Development Act | The act creates the High Value Crops Development Fund and provides for incentives in the HVCC sector. Incentives include crop insurance, credit assistance, credit guarantee, tax exemptions provided to agriculture co-operatives, market linkage assistance, technical and infrastructure support, provision of postharvest facilities, among others. |
| RA 7884, 1995 | National Dairy Development Act | The Act created the National Dairy Authority. |
| RA 7607, 1992 | Magna Carta for Small Farmers | The Law promotes the development of agriculture through the empowerment of small farmers. The law provides and identifies numerous farmers' rights to enhance their knowledge and skills, increase field production and to develop their capabilities. It also provides support services in terms of infrastructure and farm inputs; farm machinery and equipment; water management and irrigation facilities; agricultural credit; incentives and price support; and research and extension services. |
| RA 7581,1992 | Price Act | The Act provides protection to consumers by stabilising the price and supply of basic necessities and prime commodities and by prescribing measures against undue price increases especially during emergency situations. Prime commodities include rice, maize, fresh, dried and canned fish and other marine products, fresh pork, beef and poultry meat, fresh eggs, fresh and processed milk, fresh vegetables, root crops, coffee, sugar, cooking oil and others. |
| RA 7308, 1992 | Seed Industry Development Act | The Act promotes and accelerates the development of the seed industry and creates the National Seed Industry Council. |
| RA 7160, 1991 | Local Government Code | Devolves agricultural extension services and workers from the Department of Agriculture to LGUs. |
| RA 6657,1988 | Comprehensive Agrarian Reform Law | The law pursues a Comprehensive Agrarian Reform Program (CARP) which redistributes lands to farmers and farmworkers. |
| Presidential Degree 717, 1975 | Agri-Agra Law | The Law mandates banks and financial institutions to allocate 25% of their loanable funds for agriculture (15%) and agrarian reform (10%) sectors. |

*Source*: DA (2015).

## Table 2.A1.2. **Units of Department of Agriculture, November 2016**

| Group | Unit |
|---|---|
| The Secretary of Agriculture | The Secretary of Agriculture<br>6 Undersecretaries<br>7 Assistant Secretaries |
| Office of the Secretary of Agriculture | 1. Internal Audit Service<br>2. Administrative Service<br>3. Agribusiness and Marketing Assistance Service<br>4. Field Operations Service<br>5. Financial and Management Service<br>6. Information and Communication Technology Service<br>7. Legal Service<br>8. Planning and Monitoring Service<br>9. Policy Research Service<br>10. Project Development Service |
| Regional Offices | 15 Regional Field Offices (RFO) |
| Bureaus | 1. Agricultural Research (BAR)<br>2. Agricultural Training Institute (ATI)<br>3. Agricultural and Fishery Standards (BAFS)<br>4. Animal Industry (BAI)<br>5. Plant Industry (BPI)<br>6. Soils and Water Management (BSWM) |
| Attached Agencies | 1. Agricultural Credit and Policy Council (ACPC)<br>2. Bureau of Fisheries and Aquatic Resources (BFAR)<br>3. Philippine Council for Agriculture and Fisheries (PCAF)<br>4. Philippine Fibre Industry Development Authority (PFIDA)<br>5. National Meat Inspection Service (NMIS)<br>6. Philippine Carabao Center (PCC)<br>7. Philippine Center for Postharvest Development and Mechanization (PhilMech) |

*Source:* DA (2016).

## Table 2.A1.3. **Policy changes concerning NFA**

| Period | Policy change | Related developments |
|---|---|---|
| 1972 | The National Grains Authority created to promote the integrated growth and development of the grains industry (rice, maize, wheat and other grains). | |
| 1981 | In 1981, the National Grains Authority transformed into the NFA. Wider commodity coverage: in addition to grains other food items like raw, fresh and manufactured food products. | Debt crises |
| 1985 | Deregulation of trading in food grains and related agricultural inputs. NFA's non-grain stabilisation and trading activities terminated, as well as importation of wheat and the distribution of flour. NFA retains the exclusive authority to import rice when necessary and when authorised by the President. Government support reduced to GOCC, including to NFA. | |
| 1987 | NFA detached from the Office of the President and realigned under the DA. | |
| 1998 | NFA authorised to intervene in the stabilisation of price and supply of basic food items. NFA transferred from the DA to the Office of the President. | WTO accession, Philippine rice crises in 1995, AFMA adoption |
| 2000 | NFA transferred from the Office of the President to the DA. | |
| 2001 | NFA transferred from the DA to the Office of the President. | |
| 2002 | In 2002, NFA transferred from the Office of the President to the DA. Opening rice trade to the private sector. NFA starts to pay tariffs on rice imports, initially using loan proceeds. | Extension of exemption of rice from tariffication |
| 2008 | NFA adjusts paddy rice support price upward. Improvements in targeting of beneficiaries of subsidised rice. | International food price crises |
| 2014 | NFA transferred from the DA to the Office of the President. | |
| 2016 | NFA transferred from the Office of the President to the Office of the Cabinet Secretary at the Office of the President. | |

*Source:* Tolentino (2002); DA (2015) and DA (2016).

## Table 2.A1.4. **Rice production and food security frameworks, 1973-2015**

| Name of the framework | Years | Commodities | Supported activities | Objectives |
|---|---|---|---|---|
| *Masagana* 99 (Bountiful 99) | 1973-85 | Rice | Production and promotion of inbred high-yielding varieties. Distribution of fertilisers at subsidised prices. Establishment of pest surveillance network. Non-collateral credit scheme for organised farmers, supervised by farm technicians who also provide extension services. | Rice self-sufficiency and making the country a rice exporter |
| Grains Productivity Enhancement Program | 1988-90 | Rice, maize | Seed and fertiliser exchange scheme. Expanded rice credit programme of the LBP. Establishment of small water impoundments (a dam to hold back water). | Increase production of paddy rice |
| Rice Action Program | 1990-92 | Rice | Fertiliser subsidy to farmers and tariff exemption for fertiliser imports. Establishment of certification laboratories. Rehabilitation of existing large-scale irrigation systems, and improving of maintenance and management of irrigation systems. | Stabilise prices and promote productivity in addition to increasing paddy rice production |
| Key Production Areas, Grains Production Enhancement Program | 1993-95 | Rice and other priority commodities | Input subsidy on seeds and fertilisers. Establishment of five-year special credit assistance. Construction of farm-to-market roads, bridges, ports. Research to improve rice technology package. Development and dissemination of education materials. | Increase production, stabilise prices and ensure productivity and profitability |
| *Gintong Ani* (Golden Harvest) | 1996-98 | Rice, maize, livestock, fisheries, high value crops and marginal areas | Abolition of direct production subsidies, but seeds and fertilisers still promoted through technology demonstration. Provision of special credit window coupled with guarantee and crop insurance. Intensified training on Integrated Pest Management using the Farmers' Field School. Construction of small-scale irrigation systems and rehabilitation of existing national irrigation systems. | Stabilise prices, transform farmers into viable entrepreneurs, and enhance farm incomes |
| *Agrikulturang Makamasa* (Agriculture for the Masses) | 1998-2000 | Rice, maize, livestock, fisheries, coconut, sugar, tobacco and high-value crops | Introduction of balanced fertilisation strategy approach. Support for on-farm postharvest and bulk-handling facilities. Construction of farm-to-market roads. Development of location-specific, cost-reducing and environment-friendly technologies. Training support through establishment of more Farmers' Field Schools. Production and distribution of education campaign materials. Generation of business information database. | Food-security, reduce poverty incidence, increase farm income, ensure sustainability and empower people |
| *Ginintuang Masaganang Ani* [1] (including Hybrid Rice Commercialisation Program and FIELDS[2]) | 2001-10 | Rice, maize, livestock, fisheries, coconut, sugar, tobacco, high-value crops | Promotion of organic fertiliser production. Seed subsidy for the use of certified and hybrid seeds. Intensified extension services covering farmers, seed growers, agricultural technologists, trainers and rice specialists. Construction of new and rehabilitation of existing national and communal irrigation systems. Provision of post-harvest facilities and other farm equipment through cost-sharing arrangements. Access to production loans by eligible irrigator's associations. | Achieve rice sufficiency while generating more employment in the agricultural sector |
| *Agrikulturang Pilipino* (Agri-Pinoy) (includes Food Staples Sufficiency Program) | 2011-present | Rice, maize, livestock, high-value crops | Establishment of community seed banks. Replacing free distribution of seeds and fertilisers with roll-over schemes. Promotion of varieties adapted to adverse conditions. Promotion of integrated crop management through training and dissemination of information materials. Construction of large-scale but quickly gestating irrigation facilities, as well as small-scale irrigation facilities. Reduction of rice wastage and promotion of brown rice consumption. Creation of direct lending scheme for rice farmers (*Sikat-Saka*). Conduct of research activities for continuous industry growth. Diversification of staples. | Initially: self-sufficiency in food staples (rice) by 2013. First target was not met – new self-sufficiency target was set to 2016 and achieving competitiveness was added |

1. *Ginintuang Masaganang Ani* (Golden and Bountiful Harvest) – Countrywide Assistance for Rural Employment and Services.
2. FIELDS: Fertiliser, Infrastructure and Irrigation, Extension and Education, Loans, Drying and other post-harvest facilities, Seeds. FIELDS was implemented over 2008-10.

*Sources:* DA (2015); Tolentino and de la Peña (2011); Bordley (2010); Mariano and Giesecke (2014).

Table 2.A1.5. **Applied MFN tariff averages by HS2 Code, 2011**

| Code | Description | No. of lines | Average tariff (%) | Range (%) |
|---|---|---|---|---|
| 01 | Live animals | 37 | 13.9 | 1-40 |
| 02 | Meat and edible meat offal | 69 | 23.3 | 3-40 |
| 03 | Fish and crustaceans, molluscs and other aquatic invertebrates | 159 | 7.9 | 1-15 |
| 04 | Dairy produce; birds' eggs; natural honey; edible products of animal origin, not elsewhere specified or included | 48 | 4.0 | 1-10 |
| 05 | Products of animal origin, not elsewhere specified or included | 31 | 2.7 | 1-3 |
| 06 | Live trees and other plants; bulbs, roots and the like; cut flowers and ornamental foliage | 26 | 5.5 | 1-15 |
| 07 | Edible vegetables and certain roots and tubers | 93 | 15.6 | 1-40 |
| 08 | Edible fruit and nuts; peel of citrus fruit or melons | 73 | 8.5 | 3-20 |
| 09 | Coffee, tea, maté and spices | 49 | 13.2 | 3-40 |
| 10 | Cereals | 25 | 21.4 | 0-50 |
| 11 | Products of the milling industry; malt; starches; inulin; wheat gluten | 38 | 9.1 | 1-40 |
| 12 | Oil seeds and oleaginous fruits; misc. grains, seeds and fruit; industrial or medicinal plants; straw and fodder | 61 | 4.0 | 1-15 |
| 13 | Lac; gums, resins and other vegetable saps and extracts | 19 | 2.5 | 1-7 |
| 14 | Vegetable plaiting materials; vegetable products not elsewhere specified or included | 7 | 3.3 | 3-5 |
| 15 | Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes | 150 | 7.5 | 1-15 |
| 16 | Preparations of meat, of fish or of crustaceans, molluscs or other aquatic invertebrates | 59 | 21.4 | 3-45 |
| 17 | Sugars and sugar confectionery | 28 | 14.7 | 1-65 |
| 18 | Cocoa and cocoa preparations | 16 | 5.5 | 3-7 |
| 19 | Preparations of cereals, flour, starch or milk; pastry cooks' products | 45 | 11.3 | 1-15 |
| 20 | Preparations of vegetables, fruit, nuts or other parts of plants | 73 | 9.3 | 1-15 |
| 21 | Miscellaneous edible preparations | 44 | 9.8 | 1-45 |
| 22 | Beverages, spirits and vinegar | 59 | 9.9 | 3-15 |
| 23 | Residues and waste from the food industries; prepared animal fodder | 33 | 8.0 | 1-35 |
| 24 | Tobacco and manufactured tobacco substitutes | 29 | 6.6 | 3-10 |

*Source:* WTO (2012).

Table 2.A1.6. **In-quota and out-of-quota tariff rates on commodities under Minimum Access Volume, 1996-2015**

| | | 1996 | 2000 | 2005 | 2015 |
|---|---|---|---|---|---|
| Live swine | | | | | |
| | In-quota | 30 | 30 | 30 | 30 |
| | Out-quota | 60 | 45 | 35 | 35 |
| Live sheep and goat | | | | | |
| | In-quota | 30 | 30 | 30 | 30 |
| | Out-quota | 60 | 45 | 40 | 40 |
| Live poultry (2 kg or more) | | | | | |
| | In-quota | 40 | 40 | 35 | 35 |
| | Out-quota | 80 | 50 | 40 | 40 |
| Pork meat | | | | | |
| | In-quota | 30 | 30 | 30 | 30 |
| | Out-quota | 100 | 60 | 40 | 40 |
| Sheep and goat meat | | | | | |
| | In-quota | 30 | 30 | 30 | 30 |
| | Out-quota | 60 | 40 | 35 | 35 |
| Poultry meat | | | | | |
| | In-quota | 50 | 45 | 40 | 40 |
| | Out-quota | 100 | 60 | 40 | 40 |
| Potato | | | | | |
| | In-quota | 50 | 45 | 40 | 40 |
| | Out-quota | 100 | 60 | 40 | 40 |
| Onions | | | | | |
| | In-quota | 30 | 30 | 40 | 40 |
| | Out-quota | 100 | 60 | 40 | 40 |
| Garlic | | | | | |
| | In-quota | 30 | 30 | 40 | 40 |
| | Out-quota | 100 | 60 | 40 | 40 |
| Coffee | | | | | |
| | In-quota | 50 | 45 | 30 | 30 |
| | Out-quota | 100 | 60 | 40 | 40 |
| Sugarcane | | | | | |
| | In-quota | 50 | 50 | 50 | 50 |
| | Out-quota | 100 | 65 | 65 | 65 |
| Maize | | | | | |
| | In-quota | 35 | 35 | 35 | 35 |
| | Out-quota | 100 | 65 | 50 | 50 |
| Rice | | | | | |
| | In-quota | 50 | 50 | 40 | 40 |
| | Out-quota | 50 | 50 | 50 | 50 |

*Source:* Piadozo (2012); EO No. 61 (2011); DA (2015).

Table 2.A1.7. **Minimum access volume allocation and utilisation rates (%), 1999-2015**

| HS heading | Description | 1999 | 2000 | 2002 | 2004 | 2006 | 2008 | 2010 | 2012 | 2013 | 2014 | 2015 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0101 | Horses (head) | 57.00 | 57.00 | 57.00 | 57.00 | 57.00 | 57.00 | 57.00 | 57.00 | 57.00 | 57.00 | 57.00 |
| | Utilisation rate | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 0 | 0 |
| 0102 | Live bovine animals (thousand head) | 15.37 | 16.27 | 18.08 | 19.89 | 20.34 | 20.34 | 20.34 | 20.34 | 20.34 | 20.34 | 20.34 |
| | Utilisation rate | 100 | 100 | 100 | 100 | 50 | 19 | 3 | 100 | 71 | 97 | 100 |
| 0103 | Live swine (head) | 2 570 | 2 570 | 2 570 | 2 570 | 2 570 | 2 570 | 2 570 | 2 570 | 2 570 | 2 570 | 2 570 |
| | Utilisation rate | 100 | 50 | 54 | 100 | 100 | 40 | 11 | 9 | 0 | 0 | 0 |
| 0104 | Live goats (thousand head) | 62.17 | 65.83 | 73.15 | 80.46 | 82.29 | 82.29 | 82.29 | 82.29 | 82.29 | 82.29 | 82.29 |
| | Utilisation rate | 0 | 28 | 0 | 1 | 3 | 1 | 0 | 8 | 0 | 0 | 0 |
| 0105 | Live poultry (thousand head) | 7 188 | 7 611 | 8 456 | 9 302 | 9 513 | 9 513 | 9 513 | 9 513 | 9 513 | 9 513 | 9 513 |
| | Utilisation rate | 25 | 24 | 30 | 9 | 25 | 1 | 0 | 9 | 0 | 0 | 0 |
| 0201 | Beef (thousand tonnes) | 4.61 | 4.79 | 5.13 | 5.48 | 5.57 | 5.57 | 5.57 | 5.57 | 5.57 | 5.57 | 5.57 |
| | Utilisation rate | 100 | 0 | 33 | 100 | 100 | 100 | 7 | 100 | 1 | 0 | 0 |
| 0203 | Pork (thousand tonnes) | 40.96 | 43.37 | 48.19 | 53.01 | 54.21 | 54.21 | 54.21 | 54.21 | 54.21 | 54.21 | 54.21 |
| | Utilisation rate | 45 | 45 | 18 | 21 | 8 | 58 | 84 | 100 | 34 | 40 | 45 |
| 0204 | Sheep and goat (thousand tonnes) | 0.85 | 0.90 | 1.00 | 1.10 | 1.12 | 1.12 | 1.12 | 1.12 | 1.12 | 1.12 | 1.12 |
| | Utilisation rate | 0 | 0 | 48 | 29 | 56 | 41 | 0 | 72 | 0 | 3 | 0 |
| 0207 | Poultry (thousand tonnes) | 17.75 | 18.79 | 20.88 | 22.97 | 23.49 | 23.49 | 23.49 | 23.49 | 23.49 | 23.49 | 23.49 |
| | Utilisation rate | 91 | 63 | 82 | 100 | 97 | 86 | 96 | 100 | 100 | 100 | 100 |
| 0701 | Potatoes (tonnes) | 1 171 | 1 240 | 1 380 | 1 550 | 1 550 | 1 550 | 1 550 | 1 550 | 1 550 | 1 550 | 1 550 |
| | Utilisation rate | 39 | 83 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 0901 | Coffee beans (tonnes) | 1.13 | 1.13 | 1.32 | 5.9 | 5.9 | 5.9 | 5.9 | 5.9 | 5.9 | 5.9 | 5.9 |
| | Utilisation rate | 98 | 96 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| 1005 | Maize (thousand tonnes) | 163.91 | 173.55 | 192.83 | 212.12 | 216.94 | 216.94 | 216.94 | 216.94 | 216.94 | 216.94 | 216.94 |
| | Utilisation rate | 99 | 100 | 100 | 10 | 100 | 47 | 5 | 65 | 6 | 34 | 70 |
| 1006 | Rice (thousand tonnes) | 111.99 | 119.46 | 164.27 | 224.01 | 238.94 | 350 | 350 | 350 | 350 | 350 | 805.20 |
| | Utilisation rate | 100 | 100 | 100 | 100 | 100 | 82 | 82 | 100 | 100 | 100 | 100 |
| 1701 | Sugar (thousand tonnes) | 48.39 | 51.42 | 56.93 | 64.05 | 64.05 | 64.05 | 64.05 | 64.05 | 64.05 | 64.05 | 64.05 |
| | Utilisation rate | 100 | 100 | 100 | 82 | 100 | 40 | 2 | 48 | 2 | 1 | 6 |

*Source*: DA (2015).

*Chapter 3*

# Adaptation to climate change in Philippine agriculture

*This chapter examines the policy framework and institutions behind climate change adaptation in Philippine agriculture. It also looks at the human, financial, physical and information resources that underpin climate change adaptation in agriculture, and pays particular attention to the factors that influence adaptive capacity. The chapter explores whether current policy measures fully enable producers to adapt to the changing climate, and whether current agriculture programmes appropriately address the sector's key vulnerabilities.*

## 3.1. Introduction

Climatically, the Philippines has been classified as one of the most disaster-prone countries in the world (WB, 2015; UNU-EHS, 2011). Although yearly typhoons have long been the norm, their increased intensity, together with their associated effects (e.g. flooding, droughts, and landslides), may wreak havoc on the agricultural sector. Land use and yields are projected to be particularly affected by climate change, and this is likely to result in lower growth of farmer income and productivity, increased disruption to food supplies, and a greater likelihood of damage to agricultural assets and infrastructure, which will in turn bring higher restoration costs. These predicted effects have added urgency to the Philippines' response to climate change and shifted the policy focus from recovery and coping with the consequences after the event, to an adaptive approach to build the resilience of farming communities.

As the group with most to lose from climate change, farmers in the Philippines have to actively adapt[1] to changing weather conditions and develop various mechanisms to cope with extreme events. Failure to do so will negatively affect their welfare and thereby further increase their vulnerability to the effects of climate change. In particular, more intensive and frequent extreme events may create or strengthen the poverty trap. Farmers' ability to take adaptive decisions depends on three things: their socio-economic situation, well-tailored and timely advice, and, crucially, the enabling environment provided by governments.

The government of the Philippines is committed to promoting adaptation on a number of fronts, and has met with some success. Awareness of climate change impacts has increased among both farmers and government officials, and the country is moving towards a comprehensive adaptation strategy. However, effective implementation of this vision faces two key challenges: priority alignment both within different governing bodies and across policies, and co-ordination across government departments and between national and local government units.

## 3.2. Weather variability and climate change: Impacts on Philippines agriculture

Philippine agriculture faces a number of constraints, many of which are determined by weather variability and climate change. This section starts by elaborating the sector's current and future climate-related vulnerabilities. It then discusses the environmental and socio-economic aspects that will influence farmers' ability to adapt to a changing climate.

### *Natural disasters cause considerable economic damage to the agricultural sector*

The Philippines is exposed to **numerous natural risks**, but is particularly vulnerable[2] to tropical cyclones, rising sea levels, landslides, earthquakes and volcanic eruptions. At least 60% of the total land area of the country is exposed to multiple hazards, and as a result 74% of its population is viewed as vulnerable (GFDRR, 2012). Tropical cyclones are the most frequent and the most damaging of all natural disasters in the Philippines, accounting for 88% of total damage and 79% of total lives lost (Jose, 2012). An average of 20 tropical cyclones

occur every year, the highest frequency in the world, with 8 or 9 making landfall and with the island of Luzon at a significantly higher risk than the southern areas (WB, 2015). Climate variability increasingly induces drought during El Niño episodes and floods during La Niña (CCC, 2010a).

The **impacts of natural hazards** in the Philippines are severe. In the last two decades, more than 25 000 people lost their lives as a result of natural disasters, and the country suffered economic losses of more than USD 14 billion (USAID, 2014). Annual damage from disasters averaged PHP 19.7 billion over the past two decades, equivalent to an average of 0.5% of GDP each year (Jose, 2012; Llanto, 2011). In 2013 alone, Typhoon Haiyan (known also as Typhoon Yolanda) caused massive destruction: more than 8 000 are estimated to have died, four million people were displaced, and approximately 2.5 million people required direct assistance to rebuild their homes and livelihoods (Oxfam, 2014).

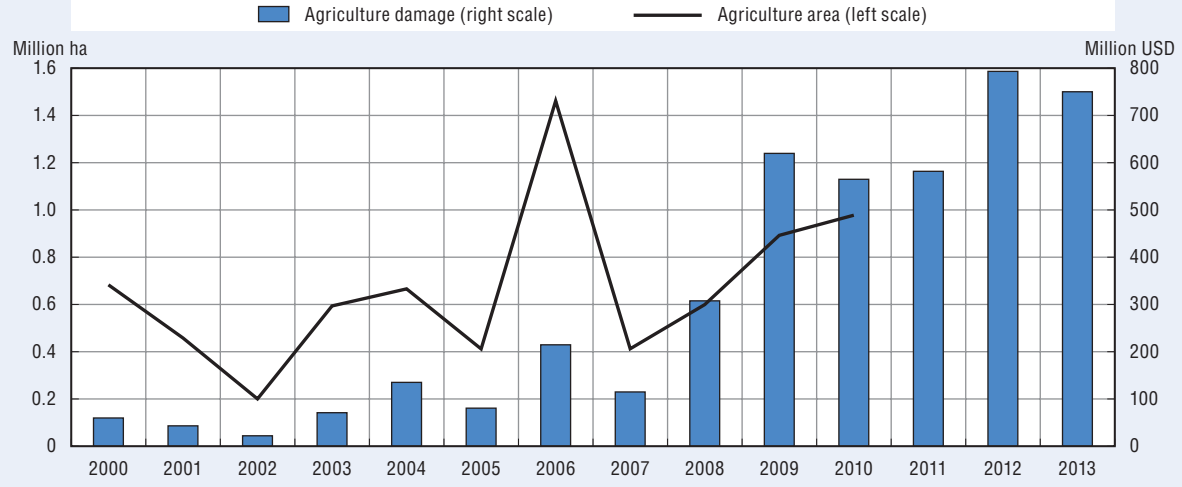
**Damage to agricultural production** from natural disasters is considerable and has increased significantly in the last decade (Box 3.1).

### Box 3.1. **Damage to agricultural production resulting from natural disasters**

Damage to agricultural production in the Philippines resulting from natural disasters is substantial. Between 2006 and 2013, the FAO (2015a) estimates that total damage and loss in the agriculture sector amounted to USD 3.8 billion, arising from 78 natural disasters: 2 droughts, 24 floods, 50 tropical cyclones or tropical storms, 1 earthquake and 1 volcanic eruption. According to NEDA (2014), damage to agricultural production from weather-related disasters (i.e. tropical cyclones, tropical storms and flooding) over the years 2010-12 increased from an already high level. Figure 3.1 shows economic damage to the agricultural sector and to the total agricultural area caused by tropical cyclones, floods and droughts between 2000 and 2013.

The majority of damage and losses (USD 3.1 billion) occurred in the crop subsector, with over 6 million hectares of crops affected (FAO, 2015a). The highest losses were observed for rice, corn and high-value cash crops (Israel and Briones, 2013). A series of tropical cyclones in 2013 severely affected the coconut industry, one of the most important sectors of Philippine agriculture (Chapter 1) An estimated 33 million coconut trees across 295 000 hectares of land were damaged in the Eastern Visayas region alone, contributing to an overall -3.3% decrease in coconut production in 2013 (DA, 2013a).

Figure 3.1. **Total value of damage to agriculture and agricultural area affected due to tropical cyclones, floods and droughts in the Philippines, 2000-13**




*Source*: Israel and Briones (2013); NEDA (2014); Uitto and Shaw (2016).

StatLink http://dx.doi.org/10.1787/888933452615

The **frequency and intensity of extreme events** is likely to increase, as will their impact[3] (GFDRR, 2015; WB, 2011). Despite the uncertainty associated with long term projections, it is likely that extreme rainfall events will become more frequent, particularly in the important agricultural regions of Luzon and Visayas. Increased rainfall intensity may trigger landslides and flooding of coastal areas and could cause crop and livestock destruction, livestock and aquaculture losses, as well as a reduction in the availability and quality of land due to erosion and landslides. Currently, 27% of the total land area in the country (8.3 million hectares) is considered to be vulnerable to drought, especially during El Niño years (NEDA, 2014). In addition, intensified drought can result in soil degradation and changes in water quality due to salt-water intrusion.

### *Climate change will slow agricultural productivity growth*

Extreme events aside, climate change is expected to affect **agricultural productivity** by affecting cropping calendars, yield quality and levels, the proliferation of pests and incidence of diseases, livestock and fisheries production, and infrastructure. Rising sea levels brought about by climate change could negatively affect the land available for crops, increase the risk of flooding and storm damage, and lead to the salinisation of coastal croplands. According to estimates by the National Mapping and Resource Information Authority (NAMRIA), a rise of one meter in the sea level could translate into an estimated land loss of 130 000 ha in the Philippines (CCC, 2010a).

The future climate of the Philippines as a whole is likely to be warmer and wetter, but climatic impacts will vary regionally. Average precipitation and temperature are projected to increase according to all four different climate models: GFDL, HGEM, IPSL and MIROC (Table 3.1). Two of the climate models, IPSL and MIROC, project an increase in precipitation across all regions in the Philippines. GFDL and HGEM simulations show a likely decrease of average precipitation in western Luzon, and HGEM additionally projects a decrease in precipitation in Central and Southern Mindanao. All four models indicate an increase in precipitation in Visayas, Northeast Luzon and Northern Mindanao. Temperatures are projected to increase by between 1.5 and 2.9°C by 2050. The HGEM model projects the most negative changes in climate for the Philippines, with temperature increases across all regions in excess of 2°C (Thomas et al., 2015).

Table 3.1. **Average Philippine rainfall and temperature changes in 2050 compared with 2000, by climate model**

| Rainfall or temperature change | GFDL | HGEM | IPSL | MIROC |
|---|---|---|---|---|
| Change in yearly precipitation (mm) | 247 | 298 | 235 | 265 |
| Change in precipitation for wettest three months (mm) | 142 | 176 | 105 | 102 |
| Change in precipitation for driest three months (mm) | 27 | 17 | 31 | 36 |
| Change in max daily temperature for warmest month ($^0$C) | 1.76 | 2.44 | 1.96 | 1.67 |

*Notes*: The results are based on the Representative Concentration Path 8.5.
GFDL = General Fluid Dynamics Laboratory model; HGEM = Hadley Centre Global Environmental Model; IPSL = Institute Pierre-Simon Laplace model; MIROC = Model for Interdisciplinary Research on Climate.
*Source*: Thomas et al. (2015).

Changes in temperature and precipitation will have differentiated local impacts. As discussed in Chapters 1 and 2, rice, maize, coconuts, sugarcane, and bananas are among the most important crops in the Philippines, both in terms of harvest area and production value: rice and maize are major staple food crops, and coconuts, sugar and bananas are important

export commodities (FAO, 2015b). Based on input from the climate models discussed above (Thomas et al., 2015), all five crops show different sensitivities to potential impacts from climate change (Table 3.2). The results suggest that the negative effects of climate change will be relatively modest for banana, coconuts, sugarcane and rice, and that coconut growers may benefit slightly from climate change. However, maize, which is already experiencing heat stress in the region, is projected to face significant negative impacts from projected temperature increases between 1.8 and 2.4°C.

Table 3.2. **Average climate change impacts on the Philippines' yields in 2050 compared with the baseline**
(% change)

| Crop | Irrigated | Rainfed |
|---|---|---|
| Banana | | -5.2 |
| Coconut | | 1.9 |
| Maize | | -21.0 |
| Rice | -0.4 | -4.5 |
| Sugarcane | -4.3 | -4.7 |

*Source:* Thomas et al. (2015).

In the aggregate, climate change effects are expected to be **negative** for most crops, including rice, maize and sugarcane, across all regions; however, some regions are expected to **benefit**. Projected declines in rice yields within the Luzon region, particularly for rain-fed rice plantations, contrast with positive development of rice yields for the Mindanao region. Sugarcane production benefits from temperature and precipitation changes in parts of central Luzon and Mindanao, but is unlikely to do so in the rest of the country. Maize is likely to be negatively affected across all regions (Thomas et al., 2015).

### *Environmental degradation magnifies the vulnerability of agriculture to climate change*

The vulnerability of agricultural systems to climate change is aggravated by **environmental degradation**. In general, natural resources and the environment are facing a triple problem of overexploitation, depletion, and deterioration of overall quality (Israel and Briones, 2013). Healthy soils, good quality water and the existence of natural predators for pests dampen the effects of climate shocks on productivity. The Philippines is a country rich in natural resources, with a high level of biodiversity, and has some of the most extensive water resources in the world (GFDRR, 2011). However, many species are endangered, and forest cover has declined to less than half the levels recorded in 1917, mostly due to logging, mining, land clearance for agriculture and settlements, and poor management (USAID, 2011). The loss of natural vegetation harms ecological and agricultural systems and in extreme cases may cause community displacement (USAID, 2011).

**Land and forest degradation** have also disrupted the hydrological cycle of watersheds, resulting in accelerated soil erosion, the silting of rivers and reservoirs, increased and more severe floods, destruction of coastal mangroves, and reduced water supply (USAID, 2011). Furthermore, groundwater levels have generally declined due to over-extraction, causing wells and springs to dry up, and leading to saltwater intrusion in coastal areas (USAID, 2011). Further irrigation in water-stressed areas will only exacerbate the problem.

### *Farmers' vulnerability to adverse shocks from climate change is amplified by poverty*

Farmers' vulnerability to adverse effects from climate change is determined by the characteristics and circumstances of their communities. Certain characteristics may make farmers susceptible and unable to cope with the damaging effects of a hazard (UNISDR, 2009; IPCC, 2007), thereby increasing their vulnerability, which can vary significantly within and between different communities. In the Philippines, factors that aggravate farmers' vulnerability include: i) poverty; ii) lack of employment opportunities outside of the agricultural sector; iii) limited access to information; and iv) conflicting policy signals. These factors are discussed in more detail below.

The vulnerability of the country's population, in particular farmers, to adverse shocks is amplified by the **high poverty incidence**[4] (Jose, 2012). As stated in Chapter 1, even if progress in poverty reduction has been significant, almost one-fourth of the population remains vulnerable to falling into absolute poverty in the event of natural disasters or deterioration in economic conditions. Declining or stagnant agricultural productivity are among the main causes of rural poverty in the Philippines (IFAD, 2009), and climate change is likely to limit productivity growth further.

Poverty aggravates vulnerability as it hampers the ability of farmers to make adaptation decisions and investments. Poor farmers have limited opportunities to access more resilient crops and technologies. For instance, not all farmers can afford to purchase high-quality certified inbred and hybrid rice seeds, despite their yield advantages (Sombilla and Quilloy, 2014). From 2009 to 2012, farmers' own-saved seeds accounted for more than 50% of the harvested rice area (Sombilla and Quilloy, 2014). In addition, while most farmers use modern varieties, they do not necessarily regularly participate in seed markets (Chapter 1).

Biotechnology crops have the potential to contribute to farmers' resilience to climate change. Adoption rates of such crops in the Philippines have increased through the years, but remain low5 (Torres et al., 2013). Farmers with low incomes are more risk-averse as they do not have "resources to spare or gamble" (Torres et al., 2013) and are thus less likely to adopt new technologies that could increase their income. Yorobe and Smale (2012) draw on data collected from smallholder maize farmers in Isabela and South Cotabato to conclude that while the use of biotechnology maize alone may not be sufficient condition to increase yield and income, it reduces the probability of falling below the poverty threshold.

**Lack of employment opportunities** outside of the sector is an additional impediment to the adaptation of farmers and agricultural systems to climate change. Partial income diversification, within and outside agricultural sector, is an important adaptation strategy (Jarvis et al., 2011). As explained in Chapter 1, a decrease in employment in agriculture, supported by good macroeconomic performance and continued job creation by non-agricultural sectors, could lead to increased agricultural productivity (through a reallocation of agricultural resources) and poverty reduction. However, according to the OECD (2013a), unemployment and job creation problems are significant in the Philippines.

Vulnerability can also arise from **limited access to** adequate **information**. For instance, the effectiveness of early warning systems remains relatively low. Around 70% of farmers in the Philippines receive warnings on tropical cyclones 24 hours prior to the event. But only 10% receive warning on flooding; 12% on continuous rain; 4% on drought; and 13% on

temperature increase. The number of weather stations also remains limited (Lansignan, 2015). The most common source of information for farmers is television, followed by radio. Other sources include neighbours, relatives and friends, and local government units (Peñalba and Elazegui, 2013). It is not clear whether farmers, on average, receive appropriate information on climate change, and whether they are aware of new technologies that can increase their resilience to climate shocks.[6]

Finally, some **policy signals** sent to farmers actually hamper their adaptive capacity.[7] These are discussed in more detail in Section 3.4.

## 3.3. Climate change adaptation policies: Existing regulatory and policy framework

Beyond the direct signals it sends regarding the likely damaging effects of climate change, the government also needs to build internal consistency in its approach to adaptation. A common set of priorities across government and an appropriate action plan help send a consistent message to farmers. It is difficult to build an understanding of priorities in the absence of an overarching strategy, or in the presence of a multiplicity of strategies with conflicting messages. Ensuring that policy makers work towards a clear set of objectives increases the likelihood that plans and strategies will be embraced. This section discusses how well climate change adaptation is integrated within the Philippine policy framework. It then presents the national climate change budget plans and priorities, in order to determine how strategic climate change priorities, set within the national policy framework, are funded and prioritised in practice. Finally, it analyses in more detail if and how climate change adaptation has been mainstreamed into the agricultural sector, as reflected by sectoral strategic priorities, plans, Programmes, Activities and Projects (PAPs), budgets and reports.

### *Strategies to improve the adaptive capacity of agriculture are on the increase*

Since the late 2000s, the Philippines has joined numerous **international initiatives** and has made numerous efforts to adapt to climate change. Most significantly at the international level, the Philippines signed the United Nations Framework Convention on Climate Change (UNFCCC) in 1994. This had an important impact on long-term domestic policies in the Philippines.

At the **national** level, explicit climate change adaptation efforts have intensified since 2007, following the formation of a task force on global warming. In 2009, the Philippines adopted the Climate Change Law, followed by the 2010-2022 National Framework Strategy on Climate Change (NFSCC) and the 2011-2028 National Climate Change Action Plan (NCCAP). Table 3.A1.1 summarises the most relevant policies and institutions in relation to climate change adaptation at the international and national levels.

The two **most significant documents** outlining climate change adaptation priorities in the country are the NCCAP and the Philippine Development Plan (PDP).

The **NCCAP** determines climate-related objectives and priorities, as well as general guidelines for action (Box 3.2); it does not detail the practical steps to be taken to increase the adaptive capacity of farmers. According to the NFSCC, the Philippines climate strategy aims to: build the adaptive capacity of communities, increase the resilience of natural ecosystems to climate change, and optimise mitigation opportunities towards sustainable development (CCC, 2010a). Food security is currently seen as the primary strategic priority of the Philippine agricultural sector.

Box 3.2. **National Climate Change Action Plan – 2011: Strategic priorities**

- food security
- water self-sufficiency
- environmental and ecological stability
- human security
- sustainable energy
- climate-smart industries and services
- knowledge and capacity development

The **PDP 2011-16** includes specific adaptation and mitigation objectives as national priorities (NEDA, 2011) and represents an improvement on its predecessor, The Medium Term Development Plan (MTPDP) for 2004-10 (NEDA, 2014). The MTPDP emphasised the importance of identifying and addressing extreme weather events and disasters but did not consider climate change impacts. More specifically, it included massive investments in flood control but left unclear whether infrastructure design and management for these projects incorporated potential climate change scenarios (Lasco et al., 2008). The PDP 2011-16 makes explicit reference to the need to consider climate change scenarios and impacts, in particular for infrastructure, agriculture and social development investments. Moreover, it includes a chapter dedicated specifically to the challenges and strategies related to creating a sustainable and climate-resilient environment.

### *But design, implementation and monitoring could be greatly improved*

The NCCAP and the PDP 2011-16 **are not fully aligned**. Together, they define at the highest policy level what is to be considered as adaptation, and their lack of alignment is likely to lead to a divergence between departmental and local development plans on strategies and PAPs. For example, flood-control projects have been classified as an adaptation activity by the NCCAP and Departments' work programmes, but have not been included under Key Result Area #5.[8] It also remains unclear whether such projects are classified as adaptation activities at local level. Similarly, post-disaster related investments have been tagged as "adaptation activities" under Departments' work programmes but not included in the other classifications (WB, 2013; Quieta, 2015).

Another important constraint preventing an effective realisation of the national adaptation plans is the **gap between knowledge generation** and project design and **implementation**. This gap persists despite the considerable efforts and progress the Philippines has made in identifying climate risks and impacts, in particular through scientific research and climate modelling.[9] Innovative tools that help assessing climate change vulnerability are often too technical and complex, hampering their wide and systematic use by Local Government Units (LGUs) (WB, 2013; NEDA, 2014). Moreover, despite a significant increase in climate change assessments, there is still a lack of studies that identify climate impacts on various ecosystems and communities at the local and regional levels (NEDA, 2014).

Moreover, a **lack of co-ordination and of clarity** on roles and responsibilities has emerged between different institutions and stakeholders. At the sectoral level, strategic priorities (Box 3.2), are not always mainstreamed and implemented through the work programmes of different Departments. For instance, a lack of co-ordination still arises among the Climate Change Commission (CCC) and the National Disaster Risk Reduction and Management

Council (NDRRMC) regarding disaster risk reduction and adaptation issues; it also arises among various DENR bureaus regarding environmental and natural resource management (NEDA, 2014). A lack of division of tasks and responsibilities, including a lack of leadership, may result in a duplication of efforts or, in extreme cases, no efforts at all. This contributes to inconsistencies in adaptation PAPs.

In addition, the **broad scope and limited local presence** of the CCC hamper its ability to implement the NCCAP and operationalise some of its tasks (WB, 2013). Conflicts also arise between national and local governments over the functions and the definition of the LGUs role in the implementation of adaptation PAPs (NEDA, 2014). Depending on the local needs and on the degree of collaboration with the central government, adaptation objectives may or may not be part of the LGUs' activities.

Lack of **institutional, financial and human capacity** also seems to be hampering effective implementation of climate adaptation initiatives. Climate and natural resources agencies suffer from a shortage of personnel, expertise, capacity, and inefficient institutional processes. At the local level, management is also constrained by poor governance and inadequate financing (NEDA, 2014). Additional resources to fund some basic technical measures are also lacking, for instance weather forecasting facilities, for which there is only one station per province (Lansigan, 2015).

Furthermore, setting adequate **indicators and monitoring systems** to measure progress and success in adaptation, or adaptive capacity, remains a major challenge. The Philippines has recently attempted to put in place a monitoring and evaluation system to measure progress and success in adaptive capacity. However, these efforts face numerous constraints. In the absence of a clear indicator, the number of environmental hazards – human-induced and hydro-meteorological events – has been used as a proxy indicator to monitor the progress for adaptive capacity (NEDA, 2014).

Finally, the lack of clarity as to what should be **tagged**, as an adaptation activity can also hamper adequate budgetary planning, prioritisation and tracking. It is unclear whether the most effective actions to increase adaptive capacity receive financial support, and whether these actions are aligned with priorities set at the national level. As recognised by the Philippines Congressional Policy and Budget Research Department, the various approaches in defining what constitutes a climate change activity have led to **inconsistencies in classifying and defining the level of funding** budgeted for climate PAPs (Quieta, 2015). The next section of this chapter looks in more detail at the country´s climate budgetary planning and prioritisation, based on strategic priorities set within the NCCAP (Box 3.2) and other relevant policies.

### *Funds for climate change adaptation are limited, though increasing*

Prioritisation of climate change adaptation in the national policy framework is mirrored by an **increase in funding sources** at the international, national, sectoral and local levels. However, several questions remain regarding how to track adaptation expenditures and whether there are mechanisms that allow for co-ordination of internationally funded PAPs with nationally funded ones.

At the **international level**, the Green Climate Fund (GCF) and, to a lesser extent, the Adaptation Fund (AF) are likely to form the two most important financing sources for adaptation projects. Support from international funds is often allocated to specific climate-related PAPs (Quieta, 2015). The mobilisation of funds for adaptation in the international arena has intensified since the recently adopted Paris Agreement. However, it is unclear at this point what share of these funds will be available for adaptation activities in the Philippines.

Moreover, various projects funded through Official Development Assistance (ODA), although not often specified as climate assistance, have an adaptation or mitigation component. From 2011 to 2014, a total of 49 PAPs, funded through ODA and amounting to PHP 50 billion (USD 1.18 billion), were tagged as climate change responsive. From these 49 PAPs, 26 PAPs (PHP 22.4 billion; USD 0.53 billion) were categorised as adaptation (NEDA, 2014). In general, most funds have been focused on adaptation, but the share of mitigation funding has been rising faster. As a result, from 2008 to 2013, the share of funds directed to adaptation dropped to 65% while funds for PAPs with mitigation benefits rose to nearly 29% (Quieta, 2015).[10]

At the **national level**, the People's Survival Fund (PSF) is the main source of financing for climate change adaptation activities followed by the Performance Challenge Fund (PCF) (Quieta, 2015). The PCF is a national fund that provides performance-based grants to local governments, with an opening balance of PHP 1 billion (USD 200 million) to support adaptation activities of local governments and communities (Quieta, 2015; CCC, 2015b).

Adaptation funds are not well-aligned with the **adaptation priorities** identified by the government. Despite food security being the first priority of NCCAP, only 1% of adaptation PAPs were related to agriculture in 2012 (NEDA, 2012). Moreover, this small share actually represents an increase of more than 140% in real terms since 2011 (WB, 2013). In the same year, a large share of funds was allocated to other strategic priorities outlined in NCCAP (Box 3.2), namely water sufficiency for municipal use, followed by ecosystem and environmental stability. According to the World Bank (2013), funding for water sufficiency has shown the largest growth among NCCAP strategic priorities, from about PHP 6 billion in 2009 to about PHP 20 billion in 2013 (from USD 0.14 billion to USD 0.47 billion).

Although climate allocations increase each year, it is uncertain whether this reflects more action on climate adaptation or a **change in tagging guidelines**.[11] Currently, many climate-tagged activities belong to the core activities of the DA.[12] Large differences exist in attitudes to tagging between the sub-agencies of the DA. Some agencies, such as BAR, tag a majority of their expenditures as climate-related, while others, like the NIA, tag less than 1% as such. At this point, it seems too early to use tagging as a basis for conclusions on the level of resources allocated to, and level of preparedness of, the Philippines' agricultural sector to climate change.

### *Mainstreaming strategic priorities needs to be strengthened at the operational level*

Among the seven strategic priorities established by the NCCAP (Box 3.2), **food security** has the strongest link with agriculture. This strategic priority is defined as "ensuring the availability, stability, accessibility and affordability of safe and healthy food amidst climate change". It focuses on two immediate outcomes: i) the enhanced climate change resilience of agriculture and fisheries production and distribution systems; and ii) the enhanced resilience of agriculture and fishing communities to climate change.

Efforts from the DA to turn the climate change adaptation strategic priorities into actions are underway. The DA created the Climate Change Program Office under its Office of the Undersecretary for Policy and Planning in 2010. This was followed by the release of a Policy and Implementation Program in 2011, which provided an initial guidance to the DA in addressing climate change issues. Moreover, some sub-departments within the DA also came up with plans and strategies to incorporate climate information into on-the-ground actions. One example is ATI's Strategic Plan 2017-2022 that outlines actions to be taken to build climate change resilient communities via harmonised and unified extension services (ATI, 2016).

In January 2013, the DA launched the **Adaptation and Mitigation Initiative in Agriculture** (AMIA), a programme to mainstream climate change considerations within the Department.[13] Under the AMIA, the DA introduced the **Climate Change Systems-Wide Program** (CCSWP) (Table 3.A1.2), which cuts across policy instruments and agencies of the Department and is expected to allow the Department to better address climate change vulnerabilities and risks. The DA now envisions strengthening the implementation of adaptation activities by: i) building its human and institutional capacity by strengthening knowledge and skills and developing an organisational culture ("mainstreaming at the strategic level"); and ii) incorporating climate change systems-wide programmes in all departmental policies across functions and agencies ("mainstreaming at the operational level") (Serrano and Ilaga, 2014).

Many of the efforts of the Climate Change office within the DA have been aimed at ensuring the success of **capacity-building** activities, ensuring that the staff and personnel are well aware and equipped to address climate change issues within their respective mandates. This is reflected in various efforts such as developing partnerships. For instance, the DA established a collaborative relation with the Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA) and the University of the Philippines Los Baños Foundation, Inc. (UPLBFI) to implement the Strengthening Implementation of Adaptation and Mitigation Initiative in Agriculture (AMIA) (SEARCA, 2015).

Progress towards incorporating system-wide climate change programmes in all departmental policies is, however, less evident and faces significant **constraints**. First, the DA's CCSWP does not make explicit reference to NCCAP strategic priorities. Second, it is unclear how different institutions at the national, sectoral and local levels co-ordinate in the design and implementation of existing and future climate PAPs. For instance, overlaps between the DA's CCSWP and the AMIA-rice subsector may arise. In addition, overlaps and co-ordination issues may arise among different institutions (e.g. DA, NIA, DENR, CCC, LGUs) in the implementation of programmes such as the AMIA-rice subsector programme.

Even within the DA, the silver thread of consistency in defining an adaptation action is sometimes missing; this may make it difficult for subordinate bodies to understand which adaptation actions to implement. For instance, the DA's reporting on climate change activities is inconsistent: the 2013 DA annual report (DA, 2013a) makes limited reference to climate change adaptation efforts and achievements, whereas the DA Annual Report 2014 does not make any reference to climate change adaptation (DA, 2014c); the 2013 DA Annual Report mentions the completion of Farm to Market Roads (FMR) as adaptation action, whereas the 2014 Annual Reports and those prior to the 2013 edition do not consider the constructing and rehabilitation of FMR as an adaptation action.

More importantly, little effort is made to **screen current policies** against the signals they provide to farmers. Effective alignment of existing policies with adaptation objectives and their implementation into the agricultural sector requires assessing if and how other agricultural and non-agricultural policies affect farmers' resilience to climate change. The following section of this chapter identifies and assesses a number of agricultural and non-agricultural policies which may potentially effect agricultural sector adaptation.

## 3.4. Coherence of adaptation policies

To allow PAPs and farmers respond effectively to a changing climate, the misalignment between agricultural or non-agricultural policies and climate objectives must be removed. Although farmer's production choices are to a large extent determined by markets, policies also have a role to play in enhancing farmers' adaptive capacity to climate change.

First among these is knowledge generation and dissemination, a core government responsibility (Ignaciuk, 2015). As discussed in this report, the Philippines engages in research to understand the effects of climate change on its economy in general and on the agricultural sector in particular. The government stimulates R&D, although with rice forming a staple of the Philippine diet, most research focuses on developing new varieties. However, the competitive advantage of the Philippines in agricultural production may change with the climate, and it is important to broaden the research base. Knowledge gained through research has little value if it does not reach farmers, so the efficiency of extension services is also crucial. As will be discussed in this section in more detail, reform may also be necessary in this regard.

Second, governments need to send consistent policy signals to enable farmers to make informed decisions about their current and future production choices. Policy packages should aim to minimise emissions, maximise efficient use of natural resources, and avoid locking farmers into inefficient or inflexible production patterns. To this end, this section assesses the coherence between existing policies and climate change adaptation policies. More specifically, it assesses a range of agriculture and non-agricultural policies that could impede climate adaptation, ranging from the self-sufficiency strategy to policies pertaining to agricultural trade, R&D, extension, risk management, and land and water use.

### *The priority given to rice self-sufficiency undermines other adaptation actions*

PAPs, reports and budget appropriations within the agricultural sector in the Philippines consistently define **rice self-sufficiency** as the main approach to achieving national food-security objectives (see Chapter 2). Accordingly, the majority of funds from the total DA budget continue to be allocated to the rice commodity programme and related activities (Chapter 2).

The promotion of rice production to achieve self-sufficiency could **increase the future vulnerability** of agricultural systems. Section 3.2 discussed future vulnerabilities for rice production in the Philippines and highlights that some rice-producing areas, e.g. Luzon, are likely to be exposed to droughts. By promoting water-intensive production in already water-scarce areas, support to expand irrigation systems may negatively affect the long-term resilience of agricultural systems and farmers (Ignaciuk and Mason D'Croz, 2014; OECD, 2015a).

Over-emphasis on the rice self-sufficiency strategy leaves both a shortage of – and a lack of clarity regarding – climate appropriations within the DA for a number of adaptation priorities set by the national (NCCAP and PDP) and sectoral (CCSWP) policy frameworks (as described in Section 3.3). These less-favoured priorities include: diversification of production and livelihood options for farmers; strengthening R&D; strengthening agricultural extension and support services; and conducting vulnerability and adaptation assessments, including studies on groundwater resources availability and vulnerability.

Switching from rice to more resilient crops, as well as **diversifying crops and income sources**, could significantly contribute to spreading farmers' risks and reducing vulnerability to climate shocks. Where appropriate, adaptation options could therefore include diversification of production, for instance by expanding the production of high value crops in which the Philippines already has a comparative advantage (Clarete et al., 2013) and which could result in higher net returns for farmers. Not all farmers will have the ability or desire to switch to these crops: barriers to doing so might include access to land, technology, financial services, or cultural and socioeconomic constraints. Therefore, adaptation measures should involve identifying and addressing such barriers.

### *Better integration with international markets may help improve resilience*

The Philippines' agricultural trade policy follows the country's **rice self-sufficiency objectives** (Chapter 2). Rice trade is restricted to protect farmers from import competition and price volatility. The Philippines considers relying on the world rice market a high risk as only 5-7% of the world's rice production is exported and 84% of rice exports are controlled by only five countries. Furthermore, the government considers that climate change may increase the **vulnerability** of these rice-exporting countries, which might make them less reliable sources of rice (DA, 2012).

However, aside from perpetuating the volatility of the global rice market, **trade restriction measures** also risk worsening the effects of climate change by reducing the ability of producers and consumers to adapt (Nelson et al., 2009). In the absence of distortive trade policies, climate change will result in a shifting of the comparative advantage of agricultural production and in changes in trade flows as producers respond to changing constraints and opportunities. Restrictions on rice imports, therefore, are likely to limit farmers' capacity to respond to these changes in market signals: these restrictions stimulate production of rice, even in less suitable areas, rather than motivating farmers to switch to more resilient and more competitive crops.

Moreover, the current trade policy settings induce higher domestic rice prices (Chapter 2), contribute to higher rates of undernourishment, and increase the impact of extreme weather events on the **prevalence of food insecurity** (Box 3.3). The inability to reduce production deficits caused by climate events increases the price of rice even further. This is especially important for the net-rice consumers, of which subsistence farmers form a large group.

#### Box 3.3. **Assessment of food insecurity risk under extreme climate event scenarios**

How do trade policy measures affect Philippine household food insecurity when extreme climate events occur? To answer this question a market equilibrium model (IMPACT) is used together with household survey data (Survey of Food Demand for Agricultural Commodities 2012). The approach follows an analytical framework for transitory food insecurity (OECD, 2015e).

**Definitions of risk scenarios**

Two natural disaster scenarios are developed and compared with a reference scenario without shocks. In addition to each of those scenarios, an alternative rice trade policy is simulated that sees the removal of the 18% tariff charged on rice imports (see Table 3.A1.3 for the scenario specification).

The first extreme event scenario (hereafter the Typhoon Scenario) is designed to represent an extreme event that would be specific to the Philippines. It is similar to Typhoon Haiyan, which hit the Philippines in November 2013: a strong typhoon making landfall and leading to significant flooding and wind damage across the archipelago. This event led to an increase in domestic food price by around 5%, while rice prices increased by nearly 10% (NEDA 2014). The analysis concentrates on yield losses for four commodities: bananas, coconuts, maize and rice. This scenario is based on work by Redfern et al., (2012), who estimated the effects of typhoons on Southeast Asia in 2011. The simulated yield loss in rice is 20% while slightly lower yield shocks are assumed for bananas, coconuts and maize, reflecting observed lower average yield losses from extreme events in the Philippines (Israel and Briones, 2013). To replicate additional damage to market infrastructure observed after Typhoon Haiyan, the scenario additionally assumes an increase in marketing margins (the cost of transporting commodities to markets).

Box 3.3. **Assessment of food insecurity risk under extreme climate event scenarios** *(cont.)*

The second extreme event scenario (hereafter the El Niño Scenario) simulates a strong El Niño event, with a global impact, including in the ASEAN region. The distribution of shocks is based on work by Iizumi et al. (2014), which demonstrates the average effects of El Niño events on global agriculture. The magnitude of the yield shocks are based on a series of scenarios run by IFPRI's IMPACT model as input to a Lloyd's Risk Report assessing the potential of El Niño events to disrupt agricultural markets (Lloyd's 2015). This scenario focuses on three major crops: maize, rice, and wheat.

**Market impacts of extreme climate event scenarios**

A Typhoon Scenario would lead to production loss in the Philippines of 10% for bananas, 9% for coconuts, 15% for maize and 20% for rice (Figure 3.2). These production declines, combined with increasing marketing margins that reflect damage to transportation infrastructure, lead to increases in consumer prices for all analysed commodities: maize and bananas by around 5% each, rice by 11%, and coconut by 17%. To compensate for the shortfall in domestic production and to satisfy domestic demand, maize imports increase by 72% and rice imports increase by 173%, while exports of banana and coconut are reduced.

If the tariff on rice imports is eliminated, domestic rice prices would decline by 6% instead of increasing by 11%. Thus the impact of eliminating import restrictions, pushing rice prices down, would be stronger than the impact of a typhoon, pushing rice prices up. Lower domestic rice prices and increased imports would reduce domestic rice production by an additional 1.3 percentage points.

The El Niño Scenario leads to an almost 10% contraction of domestic maize and rice production, less than in the Typhoon Scenario. Due to the global nature of this event, world production of both rice and maize declines by about 4%, and wheat production falls by 2%. Both domestic and global consumer prices of maize, rice, and wheat increase by 10%, 15%, and 7%, respectively. Since the shock affects global, regional and domestic (Philippine) markets, prices overall are found to rise more steeply than under the country-specific Typhoon Scenario, thus food demand contracts more sharply. As a result of the somewhat smaller adverse impacts on production and higher domestic prices, the Philippines' imports of maize and rice increase less than under the Typhoon Scenario. Despite the El Niño impacts, the domestic rice price remains higher than the import price, thus unlocking rice imports would still lower the domestic consumer price of rice.

**Impacts on food insecurity at the household level**

The impacts on food insecurity can be quantified in terms of changes in the rate of undernourishment. This rate is calculated by converting the simulated price and income changes to the changes in calorie intake at the household level through a detailed model of household demand. The food consumption responses of households are driven by changes in incomes and prices. Different households will react differently to those shocks, depending in particular on their specific income situation. For example, the own-price elasticity and income elasticity of rice is typically higher for low income households than for households at the upper end of the income distribution, and they will typically contract their rice consumption more sharply in case of extreme events such as those analysed here. To trace the household specific consumption responses, the analysis takes advantage of existing estimations of an Almost Ideal Demand System (AIDS) performed by Lantican et al., (2013). The simulated changes in the quantity of food consumption are easily converted to the changes in calorie intake at the household level. The quantity of rice consumption from own production is assumed to be unaffected by price changes.

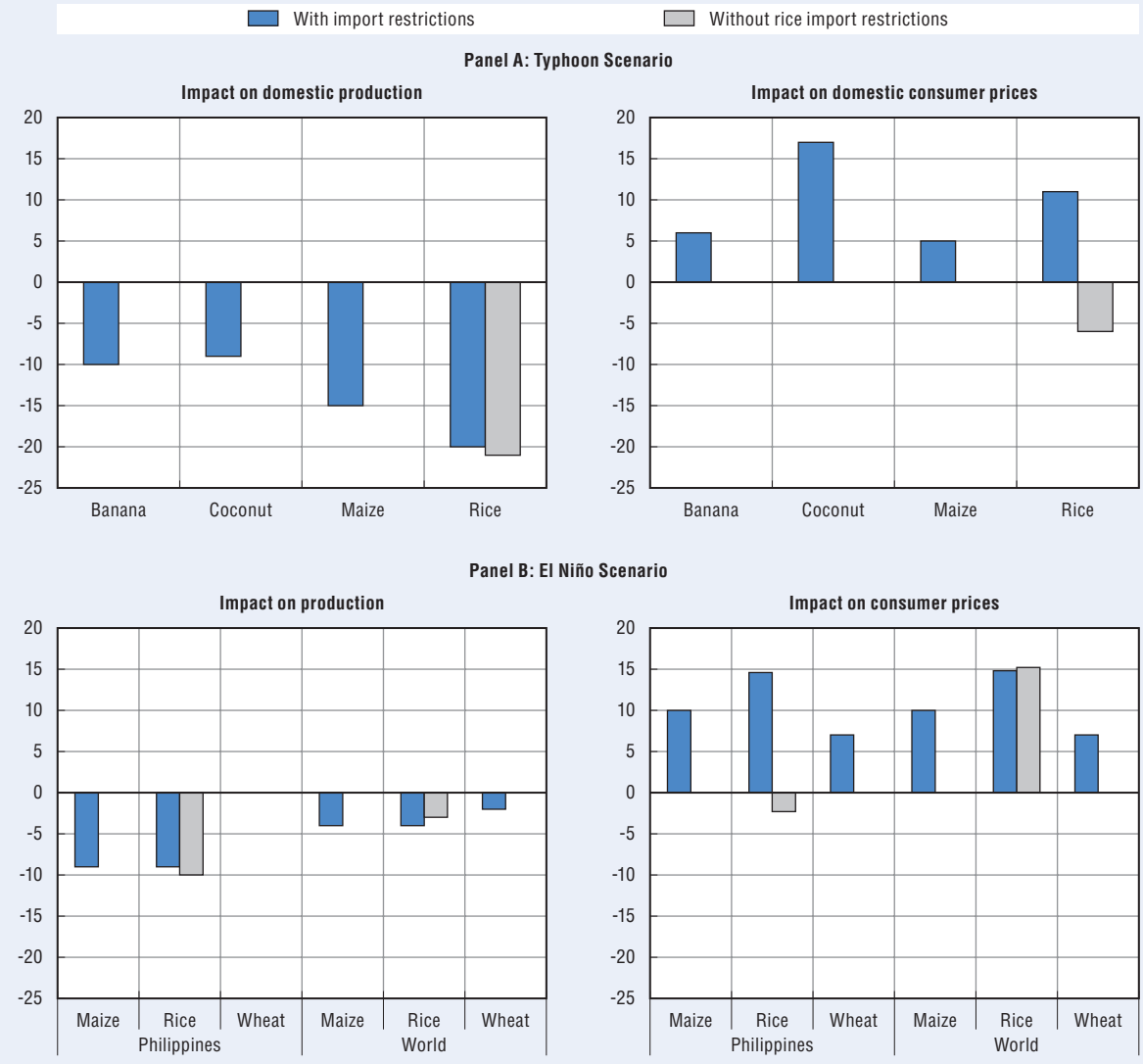
In the reference scenario without extreme events, rice trade liberalisation would decrease the rate of undernourishment by 3.2 percentage points by improving access to rice by poor households (Table 3.3). This result indicates that trade measures currently in place are working against food security objectives: they increase the rate of undernourishment. While this policy supports the incomes of net rice producers, it taxes the majority of households, who are net rice consumers. According to the Survey of Food Demand for Agricultural Commodities 2012, approximately 72% of all Philippine households and 34% of rice producing households are net rice consumers. Thus, despite the policy objective to improve food security by increasing

Box 3.3. **Assessment of food insecurity risk under extreme climate event scenarios** *(cont.)*

rice self-sufficiency and by preventing the transmission of price risks from the world market onto the domestic market, the current rice trade regime is in fact contributing to a more permanent state of food insecurity in the Philippines.

Figure 3.2. **Production and price impacts of extreme climate events**

% change relative to the reference scenario




*Source:* Authors' calculations using IFPRI's IMPACT model.

StatLink http://dx.doi.org/10.1787/888933452624

With the current trade policy in place, both the Typhoon and the El Niño scenarios significantly increase the prevalence of food insecurity in the Philippines, partly due to high domestic rice prices compared to those on international markets (Chapter 2). The policy restricting rice imports increases the rate of undernourishment by 5 and 4.5 percentage points in the Typhoon and El Niño scenarios, respectively, compared to a situation without those restrictions. The simulation results show that trade response enabled in the scenario without trade restrictions could mitigate the growth in the rate of undernourishment, even in the El Niño Scenario characterised by higher world price. In addition, the restrictive trade regime driven by the objective of self-sufficiency in rice production (Chapter 2) increases the risk of food insecurity in case of domestic crop failures.

Box 3.3. **Assessment of food insecurity risk under extreme climate event scenarios** *(cont.)*

Table 3.3. **Impacts of risk scenarios on the prevalence of food insecurity at the household level**

| | Rate of undernourishment (percentage) | Median calorie intake (kcal per day per capita) | Depth of food deficit (kcal) |
|---|---|---|---|
| **Reference** | | | |
| All Philippines | 11.2 | 1 483 | 44 |
| urban households | 11.1 | 1 479 | 47 |
| rural households | 11.4 | 1 485 | 43 |
| **Reference without rice import restrictions** | | | |
| All Philippines | 8.0 | 1 558 | 34 |
| urban households | 7.9 | 1 562 | 36 |
| rural households | 8.2 | 1 557 | 33 |
| **Typhoon Scenario** | | | |
| All Philippines | 16.0 | 1 396 | 62 |
| urban households | 15.1 | 1 390 | 65 |
| rural households | 16.8 | 1 400 | 60 |
| **Typhoon Scenario without rice import restrictions** | | | |
| All Philippines | 11.0 | 1 484 | 43 |
| urban households | 10.7 | 1 484 | 46 |
| rural households | 11.3 | 1 484 | 42 |
| **El Niño Scenario** | | | |
| All Philippines | 15.6 | 1 401 | 61 |
| urban households | 14.6 | 1 399 | 63 |
| rural households | 16.4 | 1 401 | 60 |
| **El Niño Scenario without rice import restrictions** | | | |
| All Philippines | 11.1 | 1 483 | 44 |
| urban households | 10.3 | 1 490 | 45 |
| rural households | 11.7 | 1 480 | 44 |

1. Simulated calorie intake is lower than the actual because Survey of Food Demand for Agricultural Commodities covers only 11 basic food commodities (rice, corn, noodles, bread and pandesal, root crops, meat, eggs, fish and marine products, vegetables, legumes and condiments, fruits, and milk).The calorie threshold of undernourishment is adjusted accordingly.
2. Depth of food deficit indicates how many calories per capita would be needed to lift the undernourished from their current status, everything else being constant.
*Source:* Authors' simulations based on Survey of Food Demand for Agricultural Commodities 2012.

Climate change will also limit access to markets, due to a **vulnerable and inadequate transport** infrastructure system, hampering the effectiveness and viability of adaptation options in the agricultural sector. According to ADB (2011), changes in temperature are likely to impact road surfaces; extreme weather events, such as stronger or more frequent storms, will affect the capacity of drainage and overflow systems to deal with stronger or faster velocity water-flows; and increased salinity levels will reduce the structural strength of road surfaces. Currently, only a limited number of Philippine roads have adequate drainage and many roads do not even have a permanent surface (Chapter 1).

### *By stimulating agricultural R&D the government contributes to increasing farmer's resilience*

Well-targeted **public investments** in agricultural R&D may increase the resilience of the agricultural sector (Ignaciuk, 2015). Measures such as R&D to generate more resilient crops and technology transfer are important in reducing the potential negative impacts

of climate change on agricultural production (Agrawala and Fankhauser, 2008; EEA, 2009; OECD, 2012; Ignaciuk and Mason D'Croz, 2014). Across countries, the role of the private sector in developing innovative technologies is increasing. A clear role of the public sector in stimulating R&D is to enable the private sector to invest in the development of new technologies, ensure that private knowledge gets disseminated, and encourage, where possible, public-private partnerships (PPPs) (Ignaciuk, 2015).

The Philippines has made climate change R&D investments a **strategic priority** within its national and sectoral climate-policy frameworks. The NCCAP (CCC, 2010b) includes knowledge and capacity development among its seven strategic priorities, while the PDP 2011-16 (NEDA, 2011) makes explicit reference to strengthening agricultural R&D and promoting the adoption of climate-responsive technologies and innovations. Furthermore, the DA CCSWP explicitly mentions various R&D strategies to help manage the risk of extreme climate events and to adapt to climate change (DA, 2013b).[14]

These strategies are to be carried out by a multitude of **public and private R&D agencies** (Stads et al., 2007; Chapter 2). The complex organisation of public agricultural R&D in the Philippines increases the **risk of co-ordination failures** and may lead to research fragmentation. Lack of co-ordination can hamper knowledge transfer and its integration into programme design and implementation; it can also cause overlaps between different programmes (Wesley and Faminow, 2014). How adaptation-related research is co-ordinated differs per commodity. For instance, the National Rice R&D Network (NRRDN), hosted by the Philippine Rice Research Institute (PhilRice), co-ordinates 57 public rice-related R&D agencies to avoid duplication of rice-related research (PhilRice, 2015). This consortium developed an impressive list of resilient rice varieties (Table 3.A1.4). The extent of co-ordination of climate-adaptation activities within other "commodity" group, between public and private research, or between different government institutions is less apparent.

The gap between knowledge generation and implementation of adaptation-related projects at the local level is an additional challenge. Tools to assess vulnerability of agriculture to future climate changes are often too technical and complex, hampering their wide and systematic use by national agencies, LGUs and farmers (WB, 2013; NEDA, 2014).

Current policy priorities (i.e. self-sufficiency in rice production) have resulted in the allocation of the majority of R&D funds to rice-related projects; this implies that **other crops** that are likely in some cases to be even more vulnerable to climate change effects **are underfunded**. In 2014 and 2015 rice-related R&D projects, funded within the DA, received the largest share of funds (DA, 2015b). The DA has also allocated significant resources to government corporations working on rice R&D. In 2014 alone, the DA allocated over PHP 500 million (USD 1.3 million) to PhilRice to be used exclusively for its rice R&D programme (DBM, 2014). Although the allocation of R&D resources towards rice-related R&D enforces research specialisation in an important crop which is vulnerable to climate change, a question remains whether more attention should be dedicated to other crops. For instance, maize is likely to suffer severely from climate change impacts (Section 3.2). Moreover, as budgetary resources are limited the "commodity" approach to R&D leaves almost no room for a more holistic approach to adaptation research.

In general, the Philippines ranks very low in R&D spending; at just 0.11% of GDP it ranked 89 out of 103 countries in the second half of the 2000s (Canlas et al., 2011). **Appropriations** for agricultural R&D in general and for adaptation R&D in particular are also low (Quieta, 2015; WB, 2013). For instance, despite budget increases to BAR since 2010 (Aquino et al., 2013), its budget remains low relative to that for other DA agencies. Out of the total 2014 DA

budget of PHP 70 billion (USD 1.58 billion) (DA, 2014a), the DA's related R&D activities received PHP 2.4 billion (USD 54 million) (DA, 2015a), while BAR was allocated PHP 1 billion (USD 23 million) (DA, 2014a). Besides BAR, R&D appropriations are also allocated to the DA's various commodity programmes. As discussed earlier, the current tagging system prevents a detailed assessment of the magnitude of spending on adaptation-related activities.

In order to **mainstream** climate change adaptation into the DA's R&D activities, BAR is currently advancing implementation of the "Climate Change R&D and Extension Agenda and Program" (CC RDEAP) and has initiated an integrated climate change research programme, AMIA.[15] The PHP-135-million-AMIA research programme is a cross-commodity programme for a more holistic approach to climate change adaptation issues in agriculture. Another recent BAR initiative is to develop a climate change check-list which will be obligatory for all BAR-financed activities. This initiative aims to increase the monitoring and evaluation aspects of R&D spending towards climate-related activities and to help translate the research outcomes into policymaking strategies (BAR, 2015).

### *Limited extension services reduce farmers' uptake of adaptation practices*

**Co-ordination of extension services**, or rather the lack of it, between the key actors (the DA, LGUs, farmer associations and others), is a major challenge for implementing climate change adaptation actions at the local level. Chapter 2 discussed the policy reforms that led to decentralisation of extension services. The scope and the quality of extension services provided differ per LGU, which has consequences on the level of support farmers receive to increase their adaptive capacity.

Moreover, as in the case of research PAPs, the division of extension services into commodity programmes results in a **fragmented approach** to climate change adaptation. According to OECD (2015c), agencies that deliver advice, training, and extension services to support agri-environmental management need to be well co-ordinated, effective in reaching different groups of farms and types of farming, and capable of delivering a full range of services. The current extension system seems to be inefficient in the way it provides information to farmers, including on adaptation-related activities. Farmers undergo a number of commodity- or topic-based trainings, including for instance a number of separate trainings on potential effects of climate change on different commodities (ATI, 2014). Moving away from a commodity approach towards a holistic one, including promotion of various adaptation options (such as diversification to off-farm income), may increase the efficiency of the extension programmes in the Philippines (ACIAR, 2005). These efforts, however, require scaling up and reallocating funds for extension services across commodities and programmes, and adopting a more holistic approach for the design and implementation of these services.

The adequacy of extension services' content and delivery mechanisms with regard to climate change is also unclear. According to OECD (2015c), the key ingredients for persuading and enabling farmers to adopt sustainable practices are: credible, relevant and up-to date business expertise advice, training, and extension. However, it is unclear whether services provided in the Philippines integrate and address the most relevant climate change challenges.

Farmers' **education level** and **the extension modalities** may also hamper the effectiveness of incorporating adaptation options. One study assessing the role of agricultural extension systems in the Philippines shows that farmers do not always adhere to the set of recommendations given through extension services (Saz, 2007). The author concludes that farmers only adopt government production programmes because of the financial incentives provided. The cost of participating in such programmes would otherwise have been a

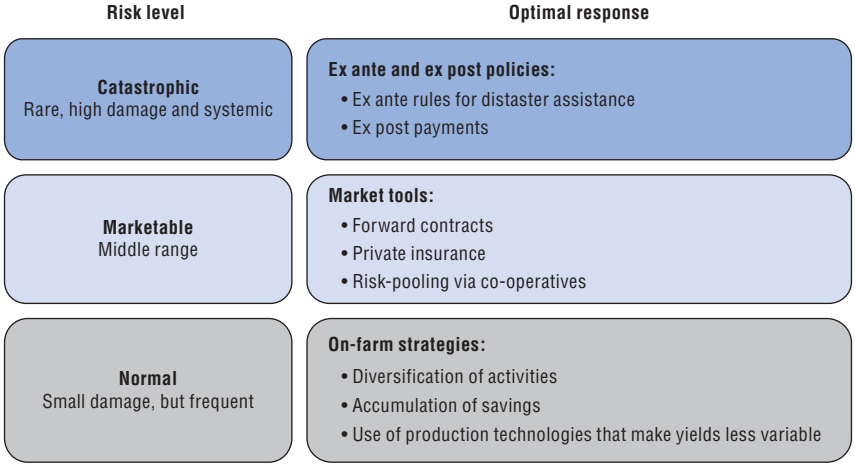
significant barrier. Moreover, farmers do not always comprehend the benefits of using the proposed technologies (Saz, 2007). This may indicate a problem with the education level of farmers but also with the way the extension services are provided.

### *Subsidised insurance programmes impede signals sent to farmers*

The **multitude of government aid** during a calamity weakens the signals sent to farmers regarding the need to address risks and reduces their incentive to adopt resilient practices. Subsidised insurance programmes are key mechanisms for allowing Philippine farmers reduce their financial exposure. However, international experience shows that subsidised insurance schemes have not been successful in reducing the use of additional *ad hoc* assistance granted after the event (OECD, 2011). In times of natural disaster in the Philippines, households, including rural households that "need it most", are eligible for direct cash transfers from the government (IFRC, 2015). The government also provides funds under the Disaster Risk Reduction and Management Act[16] and quick-response funds[17] in times of natural disasters (DBM, 2015). These funds are distributed among the LGUs to rehabilitate local and regional infrastructure and provide any other help when crisis occurs. Moreover, some NGOs provide foreign aid to farmers in the post-disaster period.

Different **layers of risks** in agriculture require different responses (OECD, 2011). Optimal risk management strategies for different risk levels dictate that government policies should not provide support to deal with normal risks, such as normal variations in production, prices and weather (Figure 3.3). Such risks should be managed by farmers themselves as part of normal business strategy, through the diversification of production or the use of production technologies which make yields less variable. Income-smoothing through tax instruments for business is also part of normal risk management (OECD, 2011). At the other extreme, infrequent but catastrophic events that affect many or all farmers over a wide area will usually be beyond farmers' or markets' capacity to cope. Examples of such risk where governments may need to step in include severe and widespread drought or the outbreak and spread of a highly contagious and damaging disease. In between the normal and the catastrophic risk layers lies a marketable risk layer that can be handled through market tools, such as insurance and futures markets or through co-operative arrangements among farmers. Examples of such marketable risks include hail damage and some variations in market prices.

Figure 3.3. **Optimal risk management strategies for different risk levels**




*Source:* OECD (2011).

As yet, such a systematic approach to risk management is lacking in the Philippines. Moreover, the subsidised insurance schemes tend to conflate risk management tools with income support for farmers. Direct forms of income support would be much more effective.

In addition to being inefficient in meeting its stated objectives, the current insurance system does not allow **the private insurance sector** to develop. Subsidising insurance is costly to governments: Reyes et al. (2015a) and Corpuz (2013) found that the operational costs of the Philippine Crop Insurance Corporation (PCIC) are high and exceed the amount of premium collected. The role of the government should be rather to provide information, regulation and training for development of market-based risk-management tools (OECD, 2011).

In the case of the Philippines, two key policy design features may actually **disincentivise adaptation**: (i) preferential subsidies for rice producers and (ii) poorly designed compensation procedures.

The **preferential treatment of rice** incentivises its production, including in climate-unfavourable areas. The largest shares of the government's crop-insurance subsidies are allocated to rice-producing farmers (54%), and corn farmers (25%), together amounting to PHP 1.54 billion (USD 35 million) in 2015 (PCIC, 2015; Reyes et al., 2015a, b). Currently, the Philippines offers varying subsidy rates by crop. Although the insurance for rice farmers may vary based on risk structure, in most programmes it is fully subsidised. Insurance for other crops such as corn or high-value crops (such as bananas, coconuts and mangos) is partially subsidised. Varying subsidy rates in this way incentivises the production of rice, despite potentially unfavourable climate conditions.

The terms of **compensation and claim procedures** for crop insurance may further disincentivise adaptive practices among subsistence farmers. The pay-outs are subject to lengthy waiting periods that disrupt efficient – and thus often adaptive – spending on farm expenditures. Claims are settled within 60 days, requiring farmers to tighten their budgets and daily expenditures in the interim (Reyes et al., 2015b). Moreover, the claim procedure can be obstructed by i) insufficient information about requested documentation; ii) inadequate staffing of PCIC to assess the damage; and, in more extreme cases, iii) difficulties of the PCIC administration in reaching the beneficiary.

An additional challenge with traditional crop insurance products is that their basic structure incentivises **moral hazard**. As pay-outs are determined by losses at the plot level, there is a risk that some farmers may make less effort or engage in maladaptive practices to intentionally disrupt yields and benefit from the insurance coverage. Applying an index-based system would simplify the compensation process, reduce moral hazard and the associated incentive for farmers not to reduce their exposure to risk. However, such system has other drawbacks (Box 3.4).

### *Land ownership uncertainties reduce incentives for investing in climate resilient technologies*

Uncertain land ownership rights (Chapter 1) **hamper the incentives** for farmers **to invest** in measures which would increase their adaptive capacity. In particular, farmers might not be willing to implement adaptation strategies which require significant investments, when their land is not secure or they do not have full rights on the land (Yegbemey et al., 2013; Kudejira, 2014; Mutisi, 2009). For instance, a study of farmers' adoption of Sloping Agricultural Land Technology (SALT)[18] in the Philippines found that when farmers do not have long-term land tenure security they are less likely to invest in technologies for the long-term sustainability of their land (Malla, 2014).

### Box 3.4. **Index-based insurance**

Under index-based insurance, indemnity depends on an index that is correlated with losses, such as wind speed, the amount of rain during a certain period (weather-based indices) or average yield losses over a larger region (area yield indices); pay-outs take place when the index falls above or below a pre-specified threshold (Greatrex et al., 2015).

Index-based insurance is increasingly being promoted as a climate risk management option, complementary to other adaptation options, as well as an alternative to conventional crop insurance. Using index insurance, rather than conventional crop insurance, can help address the issue of moral hazard and adverse selection as pay-outs depend only on an observable and objective index (Karlan et al., 2013; Greatrex et al., 2015). Other potential advantages (given functional and reliable weather and satellite stations) include reduced administrative costs, offering the potential for lower premiums, and shorter pay-out timelines, as insurance providers might no longer need to carry out loss assessments on individual farms (IFC, 2015).

Index insurance schemes face various challenges. For instance, basic risk can arise if an individual´s actual loss does not correspond with the index pay-outs. This might result from an imperfect correlation between rainfall measured at the weather stations and farmers' actual losses (IFC, 2015; Lansigan, 2015; Greatrex, 2015). In addition, there is a lack of high quality weather- and yield-data in many developing countries, and significant financial and human capital is required before standardised products and systems can be developed (IFC, 2015; Lansigan, 2015); this would pose a problem for a wider adoption of such system in the Philippines. Combining weather-index insurance with area insurance may remove some of these challenges.

Despite these challenges, index insurance initiatives for smallholders are currently implemented in various countries and have demonstrated important benefits. A recent CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) report (Greatrex et al., 2015) which includes case studies from India, Kenya, Tanzania, Rwanda, Ethiopia, Senegal and Mongolia, suggests that index insurance has the potential to benefit smallholder farmers. The Rural Resilience Initiative (R4) in Ethiopia and Senegal targets poor smallholder farmers previously considered to be uninsurable (due to poverty, lack of education, data limitations and remoteness). R4 refers to four integrated risk-management strategies: risk reduction, risk reserves (or savings), risk transfer and prudent risk-taking (access to microcredits). Farmers facing liquidity constraints have the option to access insurance premiums in exchange for labour (through Insurance for Work Programmes) or through a combination of cash and labour. Insurance for work programmes also integrate other R4 strategies by for example employing farmers in risk reduction related activities (Greatrex et al., 2015). The R4 initiative has helped to increase the amount of savings and animals by farmers, and to increase investments in seeds, fertiliser and productive assets (Greatrex, 2015, Choularton, 2015).

In the Philippines, the Philippine Crop Insurance Corporation (PCIC) and MicroEnsure, in collaboration with local insurance providers, have piloted weather index insurance in selected provinces (Lansigan, 2015). Weather index insurance implementation is a joint venture of the DA, PCIC, DEN, DST, NIA, PhilRice, World Bank and CCC (DA, 2014). Pilots have been implemented in Davao del Norte in 2012-13 and Agusan del Norte in 2009-11. The PCIC, in co-operation with the Philippines Climate Change Adaptation Project (PhilCCAP) and the DA, is also currently piloting index insurance services for rice and corn in Peñablanca, Cagayan Province and Dumangas, Iloilo Province (Lansigan, 2015; DA, 2014). Pay-outs are based on the weather indices from the Automatic Weather Station. Coverage only includes the occurrence of extreme weather events and therefore excludes damages from pests and diseases (DA, 2014b).

Box 3.4. **Index-based insurance** *(cont.)*

Lansigan (2015) has identified the following challenges and imperatives in implementing weather index insurance in the Philippines:

1. PAGASA weather stations, the only stations recognised by local insurance providers and PCIC, are sparsely distributed around the country with roughly only one gauging station per province. World Meteorological Organisation standards suggest that one weather gauging station for every 20 $km^2$ area is needed. Therefore, the density of weather stations in the country needs to increase.
2. The relatively high premium associated with weather index insurance products, compared to fully subsidised premiums on PCIC programmes, discourages farmers from getting insurance coverage, and the number of subscribers remains low.
3. The current insurance system does not sufficiently create an enabling environment for weather index insurance implementation. There is a need to conduct a massive information campaign and awareness-raising, and to draw on lessons from pilot projects to improve development and implementation.

The insecurity and **unclear legislation** regarding land ownership impacts farmers' planning horizons and confidence in their potential to recover the long-term benefits of investments in new technologies and practices (Cenas and Pandey 1996; Nelson 1998; Malla, 2014). Another example of how unclear property rights affected farmers' recovery from natural disasters can be illustrated by the Philippine government actions to help coconut farmers to cope with the 2013 typhoon losses. A law prohibiting the cutting, disposal or harvesting of coconut trees without the express consent of the landowner left it unclear who should bear the costs and benefit from the proceeds from clearing and selling fallen coconut trees after a natural or climate event when farmers do not have clear ownership rights of land (Oxfam, 2014).

### *Water policies and infrastructure are inadequate to deal with climate change*

Despite the abundance of water in the Philippines, **water supply** is time- and site-specific and has become a scarce commodity in some areas. The amount of rainfall an area will receive is made less predictable by climate change and can have secondary consequences such as water scarcity or flooding (as evidenced in Section 3.2), with adverse effects on agricultural systems and farmers. Thus, emphasis on water security[19] (OECD, 2013b) and proper allocation[20] and management of water is imperative.

The NCCAP recognises various weaknesses that **hamper water sufficiency** in the Philippines, namely: weak protection of vital water resources; low access to financing to protect supply and improve distribution; inadequate performance of water service providers; inadequate support for rural water planning and infrastructures; and inadequate water-resource information for planning (CCC, 2010b). In addition, the NCCAP states that these weaknesses compromise the country's ability to respond to the additional challenges posed by climate change, thereby widening the adaptation deficit.

Furthermore, there is **little co-ordination** among stakeholders, which may hamper effectiveness, efficiency, trust and engagement (three mutually reinforcing principles) of water governance[21] (OECD, 2015b). This may negatively influence the adaptive capacity of farmers who may face water shortages due to inefficient water-governing systems. Currently, over 30 government offices are charged with the management of water resources and watersheds and separate agencies oversee supply and distribution (CCC, 2010b). This has resulted in

fragmented management and weak protection of water resources. Senate Bill 1585 (2013) proposed one Water Regulatory Commission to streamline the current regulatory landscape and oversee all service providers, whether public or private, but it has yet to pass (Navarro, 2013). Aside from enacting a national regulatory framework, restructuring of the water industry needs to take place and performance targets need to be implemented (Navarro, 2013).

Irrigation plays a central role in agricultural and, in particular, rice production in the Philippines. However, from a climate change adaptation lens, **current irrigation systems** in the Philippines remain inadequate (ADB, 2012). First, in most cases the engineering designs for existing irrigation systems use standardised design criteria without regard to changing climatic conditions (WB, 2010). Second, the predominant cultivation and water management practices, as well as irrigation pricing mechanisms encourage the inefficient[22] use of water resources.

Enhancing resilience of **irrigation infrastructure** to climate change has recently become a public concern in the Philippines. The NCCAP (CCC, 2010b) recognises that the water infrastructure and management systems in the Philippines are designed for less variable climate conditions. Since 2010 under the framework of the PhilCCAP, the government has started to re-think irrigation infrastructure in the face of climate change. Component 2 of PhilCCAP incorporates a subcomponent specifically aimed at redesigning and strengthening the climate resilience of vulnerable irrigation infrastructure (WB, 2010).

Despite the achievements in the context of PhilCCAP, it is important to note that less than 1% of NIA's overall 2015 **budget** is devoted to climate change adaptation; this amount is inclusive of national and foreign-assisted projects (Navarro, 2013). NIA also has a quick-response fund that is directed towards restoring irrigation structures after disasters. This fund amounts to about 2% of NIA's total budget. Overall, a lack of funds has hampered the effectiveness of adaptation PAPs. For instance, because of financial constraints NIA could not purchase the most accurate weather data from PAGASA and has relied on climate change data approximations to assess the technical specification of new canals. This makes it difficult to properly calculate long-term risks.

Besides inadequate infrastructure, current irrigation practices encourage the **inefficient use of water** resources. Continuous flooding has been embedded as a cultural practice amongst rice farmers (DENR and UNDP, 2015), but this practice hampers mitigation and adaptation, as it leads to methane fermentation (methane being a potent greenhouse gas) and to an excessive use of water.

The widespread occurrence of continuous flooding in the Philippines results in part from a **lack of economic incentives** for the adoption of more efficient water management. Irrigation service fees (ISF) are based on the size of irrigated area and not on the amount of water used, and vary depending on the type of irrigation system (e.g. pumps, reservoir, and diversion). Farmers pay a flat irrigation service fee per hectare, per season, per crop for National Irrigation System and they pay amortisation for Communal Irrigation System up to 50 years at 0% interest (NIA, 2013; Chapter 2). Without payments per actual use of water, there is no incentive for efficient use. Further, collection of fees depends mostly on the willingness of farmers to pay, which in turn is associated with the harvest they get in a given period and on their satisfaction with the provision of irrigation services (DENR and UNEP, 2015). Because water distribution is frequently unbalanced (with more water concentrated and extracted upstream the irrigation system), dissatisfaction and unwillingness to pay are frequent issues. In fact, collection rates are reported to be between 63% and 67% in 2013-15 (OPAFSAM, 2016). In addition, there is currently a lack of technical assistance to support the introduction of improved water management systems (DENR and UNDP, 2015).

Alternate Wetting and Drying (AWD) (Box 3.5) is promoted as an irrigation system with large **adaptation and mitigation potential**. Since 2001, pilot projects aimed at introducing AWD systems have been carried out in Luzon. In 2009 the Department of Agriculture also issued DA Administrative Order 25 "Guidelines on the Adoption of Water Saving Technologies (WST) in Irrigated Rice Production Systems in the Philippines". This is the only existing policy document that supports the implementation of AWD (DENR and UNDP, 2015). It is not clear what share of farmers actually adopts the AWD systems; according to DENR and UNDP (2015), in 2013, 8% of all irrigated rice fields in the Philippines or 140 000 ha applied AWD, but according to NIA the area was much smaller. One of the ways to promote the wide adoption of AWDs is currently being tested via the UNDP-led AMIA-rice project.[23] Farmers receive a 20% reduction in ISF when adopting AWD, which is awkward as it goes against the signal needed to foster more efficient water use. But this ISF reduction results in a 100% ISF collection rate in the areas where AWD is adopted (DENR and UNDP, 2015).

### Box 3.5. **Alternate Wetting and Drying (AWD)**

AWD is a management practice in irrigated lowland rice. It allows the rice field soils to drain intermittently during the rice life-cycle rather than having the field continuously flooded (Nalley et al., 2015). AWD uses a simple tool to guide the farmer in determining the right time to irrigate and the right amount of water to apply (DENR and UNDP, 2015).

Potential benefits of AWD include:

- Reduced and more efficient water use: by reducing the number of irrigation events required, AWD can reduce water use by up to 30%. More efficient use of water resource can translate into more irrigated rice fields, increase reliability of downstream irrigation water supply or less pressure on natural resources.
- Increased resilience to water shortages.
- Greenhouse-Gas mitigation: AWD is assumed to reduce methane (CH4) emissions by an average of 48% compared with continuous flooding. Combining AWD with nitrogen-use efficiency and management of organic inputs can further reduce greenhouse gasses.
- Increased productivity: if adequately implemented, AWD does not reduce yields compared with continuous flooding, and may in fact increase yields by promoting more effective tilling and stronger root growth of rice plants. Farmers who use pump irrigation can save money on irrigation costs and see a higher net return from using AWD.
- Increased environmental sustainability through improved soil quality.

*Source:* Richards and Sanders (2014); DENR and UNEP (2015).

## *3.5. Summary*

The **impacts of natural hazards** in the Philippines are severe: between 2006 and 2013, total damage and losses in the agriculture sector amounted to USD 3.8 billion. An increased frequency of extreme events has already been observed in the Philippines and this trend is likely to continue. Currently, 27% of the total land area in the country (8.3 million hectares) is considered to be vulnerable to drought, especially during El Niño years. Luzon and Visayas are likely to experience extreme rainfall as a result of climate change; extreme high-temperature events are likely to intensify across all regions.

Climate change will slow agricultural productivity growth for most commodities; rice and maize are likely to suffer moderate and significant damage from higher temperatures, respectively. A few crops (e.g. coconut) may, on average, gain from a changing climate.

The prices of a majority of agricultural commodities are likely to increase due to climate change effects. The extent of the climate change effects will depend on farmers' and agricultural sector's **adaptive capacity**. High poverty rates amplify farmers' vulnerability to climate change by hampering their ability to make adaptation decisions and investments. Similarly, the vulnerability of agricultural systems is aggravated by environmental deterioration, pollution and over-exploitation of natural resources and ecosystems.

The existing regulatory and **policy framework** in the Philippines reflects a substantial awareness regarding the threats posed by climate change and the need to address them. However, the two most relevant Philippine documents outlining adaptation strategies, the Philippines Development Plan and the National Adaptation Plan, are not well co-ordinated. This increases the inconsistencies of how adaptation is mainstreamed in sectoral and local plans. Despite the prominence of adaptation in budgetary planning, existing inconsistencies in the classification of what comprises climate change adaptation activities prevent consistent tracking and monitoring. Based on the current system of tagging, it is not possible to conclude whether there is a real increase of spending on adaptive actions. Moreover, doubt exists as to whether the tagged activities are indeed the most effective in increasing resilience of natural and human systems in the long term.

Policies have a role to **enhance farmers' adaptive capacity** to climate change. Knowledge generation and dissemination is a core government responsibility. The Philippines is active in supporting R&D for climate resilience, but this effort is too focused on rice. Such focus may ultimately decrease farmer's resilience by disregarding potentially more efficient solutions. In addition, extension delivery in the Philippines faces significant constraints, such as a lack of co-ordination between the key co-ordinating and implementing actors and a focus on increasing current production systems without taking into account climate change adaptation needs. An improvement of the efficiency of extension services, therefore, is likely to result in higher adaptive capacity of farmers.

However, policies may also **impede** climate adaptation of the agricultural sector. Policies stimulating rice self-sufficiency, for instance, pre-determine the prioritisation of crops to be covered by adaptation actions and may undermine the exploration of other adaptation strategies. It can also directly contribute to some maladaptive behaviour when, for instance, production of rice is stimulated in areas that already suffer from water shortages. With climate change this situation may further deteriorate. Similarly, current trade restrictions on rice imports have a detrimental effect on future food security as they worsen the effects of climate change and prevent efficient allocation of production in the face of climate change.

Current **risk management and land tenure** policies do not necessary increase the investment capacity of farmers, which may impede adaptation. The current crop insurance and disaster protection system supports rice producers to a large extent; this is likely to delay farmers responding and adapting to climate change; in particular it disincentives them from diversifying their crops, an activity which would improve resilience. Uncertain land-ownership rights hamper adaptation investments. Lack of property rights increases the vulnerability of farmers to climate change by discouraging and limiting adaptive capacity and investments in adaptation options.

The Philippines' water related agricultural and non-agricultural policies have significant effects on adaptive capacity of agricultural sector. The current **water distribution system** in the Philippines is inadequate to respond to climate change-related intensified rain surges and droughts, which may negatively affect irrigation water availability and in turn decrease the adaptive capacity of farmers. Current irrigation practices in the Philippines remain

inadequate to respond to climate change. The most prevalent type of irrigation (flooded irrigation) and current water payment system leads to inefficient use of the resource. Wasteful use of current water resources intensifies farmers' vulnerability to climate change.

### *Notes*

1. Adaptation seeks to both moderate the harm of climate change and exploit beneficial opportunities, requiring an adjustment of both natural and human systems (IPCC, 2007).
2. Vulnerability is defined as the characteristics and circumstances of a community, system or asset that make it susceptible to the damaging effects of a hazard; there are many aspects of vulnerability, arising from physical, social, economic, and environmental factors (UNISDR, 2009). According to IPCC (2007), vulnerability to climate change is the degree to which geophysical, biological and socio-economic systems are susceptible to, and unable to cope with, the adverse impacts of climate change. The term "vulnerability" may therefore refer to the vulnerable system itself, e.g., low-lying islands or coastal cities; the impact to this system, e.g., flooding of coastal cities and agricultural lands or forced migration; or the mechanism causing these impacts, e.g., disintegration of the West Antarctic ice sheet.
3. A slight increase in the number of tropical cyclones, with maximum sustained winds of greater than 150 kph and above (typhoon category), are projected as a part of El Niño event (PAGASA, 2011). IPCC (2011) projections show a high variability of tropical cyclones over the decades, but there is no indication about changes to their frequency.
4. In the Philippines, the poverty line (threshold) is defined as the minimum income or expenditure required for a family or individual to meet the basic food and non-food requirements (PSA, 1997). See Chapter 1 for more information.
5. In 2012, the area planted to biotech corn in the Philippines was projected to increase to 750 000 ha, which is 16% higher than that of 644 000 ha in 2011. Biotech corn is now benefiting about 375 000 small resource-poor farmers in the country, with farm-level economic gains from biotech during the 2003-11 period estimated at USD 264 million and for 2010 alone at USD 93.6 million (Torres et al., 2013).
6. Some farm communities benefit from projects providing more adequate information and risk management tools. PhilCCAP co-designs various climate-smart tools including: (i) Climate Smart Decision Support System – a web and mobile phone based tool developed by International Rice Research Institute that provides climate information and information on climate adjusted agronomic management practices for rice and corn, (ii) Enhanced Climate Smart Farmers Field School Manual – recently developed by Bureau of Soil and Water Management (BSWM) to educate farmers, extension workers, and stakeholders on climate change adaptation technologies and risk management in agriculture sector, and (iii) Enhanced Climate Smart Farmers Field School – conducted by Agricultural Training Institute (ATI).
7. Adaptive capacity refers to the potential, capability, or ability of a system to adapt to climate change stimuli or their effects or impacts (IPCC, 2007).
8. On 13 May 2011, the President of the Philippines (2011) issued Executive Order No. 43 providing the *President's Guidepost or Social Contract with the Filipino People* containing the 16-point action agenda or areas for transformational leadership. These were translated into 5 Key Result Areas (KRAs): 1. Transparent, accountable, and participatory governance; 2. Poverty reduction and empowerment of the poor and the vulnerable; 3. Rapid, inclusive, and sustained economic growth; 4. Just and lasting peace and the rule of law; and 5. Integrity of the environment and climate change adaptation and mitigation.
9. Currently, the Philippine Atmospheric, Geophysical and Astronomical Service Administration (PAGASA) is responsible for providing accurate and reliable scientific weather and climate related information and services (PAGASA, 2015). In addition, numerous international and national organisations have gathered information regarding general trends and potential climate change-related impacts.
10. A different conclusion can be drawn from analysing the bilateral flows as reported by Development Assistance Committee of the OECD; although assistance in support of climate change objectives seems to vary significantly, more resources were devoted to climate change adaptation over the period 2010-14 (OECD, 2016).
11. The Climate Change Expenditure Tagging (CCET) is a process of identifying, reporting, and tracking Programs, Activities, and Projects (PAPs) that are responsive to climate change adaptation and/or climate change mitigation. This is being done by the National Government Agencies by submitting a climate change (CC) expenditure form (or the BP Form 201F) to the Department of Budget and

Management during the budget preparation, and once the National Expenditure Program (NEP) and the General Appropriations Act were approved. Climate Change Tagging Expenditure started in FY 2015 Plan and Budget Preparation through the issuance of *DBM and Climate Change Commission (CCC) Joint Memorandum Circular 2015-01* (CCC and DBM, 2013).

12. Based on the CCC's guidance of adaptation tagging, each agency, including the DA, allocates its adaptation funds to its own activities. The overall public budget of the DA allocated to agricultural development has experienced a significant increase, from around PHP 35 billion (USD 0.8 billion) in 2011 (DA, 2011: *http://goo.gl/1bQhxO*, p. 40) to PHP 69 billion (USD 1.58 billion in 2014 (DA, 2014a: (*http://goo.gl/jo6JQT*, p. 75) and PHP 89.2 billion (USD 2 billion) in 2015 (DBM, 2015: *http://goo.gl/yF8XPj*). The planned share of the DA's climate change allocations in the overall 2015 budget was 22%, but those in the actual 2015 budget reached 36% (PHP 14.2 billion). The DA's budget proposal for 2016 tags about 41% of its resources as climate related (DBM, 2015). Again, although the reported share of adaptation actions increased, the classification of activities seems to change on an annual basis.

13. The AMIA pursues four strategic objectives to advance mainstreaming climate change adaptation and mitigation into the DA's plans and actions: a) increase the adaptive capacity and productivity potential of agriculture and fisheries livelihoods by modifying commodity combinations to better meet weather issues and natural resource endowments; b) redefine or remap the Strategic Agriculture and Fisheries Development Zones by including climate change vulnerabilities as part of mapping variables; c) redefine the agriculture development planning framework by including key factors or variables associated with climate change; and d) develop a new framework and plan for the provision of "new" government agriculture services towards the accelerated development of climate-smart agriculture and fisheries industries (DA, 2013b).

14. The CCSWP supports the following activities: generating data for disaster risk reduction, planning, and management; conducting vulnerability and risk assessments; mapping productive areas and carrying out pest population surveys; improving and establishing early-warning and agro-meteorological systems; identifying, generating, and disseminating adaptive tools, technologies, and practices; pursuing new tools and knowledge in partnership with the scientific community; breeding and screening for climate-resilient crops and tolerant livestock and poultry; and assessing adoption rates and effectiveness of adaptation and mitigation measures.

15. The CC RDEAP was mapped out in 2009, as a result of a participatory consultative process which integrated experts from multiple concerned agencies: University of the Philippines (UP) Los Baños, UP Diliman, DOST PAGASA, DA, BSWM, SEARCA, among others. The agenda and programme aim to contribute to food security, livelihoods, poverty reduction, global competitiveness and sustainability (BAR, 2011).

16. The Disaster Risk Reduction and Management fund is a lump sum fund appropriated under the General Appropriations Act (GAA) to cover aid, relief, and rehabilitation services to communities or areas affected by man-made and natural calamities, repair and reconstruction of permanent structures, including capital expenditures for pre-disaster operations, rehabilitation and other related activities (DBM, 2015).

17. These are built-in budgetary allocations that represent pre-disaster or standby funds for agencies to immediately assist areas stricken by catastrophes and crises (DBM, 2015).

18. Sloping Agricultural Land Technology (SALT) is a conservation farming scheme developed by Rev. Harold Watson while working in the Mindanao Baptist Rural Life Center (MBRLC), a non-government organisation based in the Davao del Sur province in Southern Philippines during the early 1970s (Malla, 2014).

19. According to OECD (2013b), water security is about managing water risks, including risks of water shortage, excess, pollution, and risks of undermining the resilience of freshwater systems. Achieving water security means maintaining acceptable risk levels for these four water risks.

20. According to OECD (2015a), allocation is basically a means to manage the risk of shortage and to adjudicate between competing uses. Allocation arrangements consist of a combination of policies, laws and mechanisms.

21. OECD (2015b) Principles on Water Governance intend to contribute to tangible and outcome-oriented public policies, based on three mutually reinforcing and complementary dimensions of water governance: effectiveness, efficiency, and trust and engagement. Effectiveness relates to the contribution of governance to define clear sustainable water policy goals and targets at all levels of government, to implement those policy goals, and to meet expected targets. Efficiency relates to the contribution of governance to maximising the benefits of sustainable water management and welfare at the least cost to society. Trust and engagement relate to the contribution of governance to building public confidence and ensuring inclusiveness of stakeholders through democratic legitimacy and fairness for society at large.

22. Irrigation efficiency equals the share of water that is effectively used by crops relative to water withdrawal rates for irrigation (Ignaciuk and Mason D'Croz, 2014).

23. According to DENR and UNDP, if the AMIA for the rice subsector strategy is effective in promoting AWD on the targeted 750 000 ha, approximately 12.15 million ktCO2e/year of emission reductions from rice cultivation could be achieved; this represents around 25% from an estimated baseline level of 50 826 ktCO2e/year. In addition, the strategy is expected to result in savings in irrigation water and its more efficient use, allowing improvements in water sufficiency in agriculture, which is essential for long-term adaptation. Additional benefits are expected in food security, namely an increase in yields per hectare as a result of overall irrigable land due to the increased availability of irrigation water (DENR and UNDP, 2015).

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# ANNEX 3.A1

## *Climate change adaptation policy tables*

Table 3.A1.1. **Policies and institutions in relation to climate change adaptation**

| Policy or Institution | Date |
|---|---|
| Signature of UNFCCC | 1994 |
| Kyoto Protocol (Signature/ratification/entry into force) | 1998/2003/2005 |
| Presidential Task Force on Climate Change | 2007 |
| Climate Change Act | 2009 |
| Philippine Strategy on Climate Change Adaptation | 2009 |
| Establishment of the Climate Change Commission | 2009 |
| Membership of Climate Vulnerable Forum | 2009 |
| National Framework Strategy on Climate Change 2010-2022 | 2010 |
| Technical Committee for Climate Change and Health | 2010 |
| Philippine Development Plan 2011-2016 | 2011 |
| National Climate Change Action Plan 2011-2028 | 2011 |
| People´s Survival Fund Act | 2012 |
| Guidelines in Tagging and Tracking Government Expenditures for Climate Change in the Budget Process: National Level | 2013 |
| Guidelines in Tagging and Tracking Government Expenditures for Climate Change in the Budget Process: Local Level | 2014 |
| Midterm Update- Philippine Development Plan 2011-2016 | 2014 |
| Membership of Vulnerable Twenty Group of Finance Ministers | 2015 |

Table 3.A1.2. **The Climate Change Systems-Wide Programs on Climate Change (CCSWP) and Expected Outcomes**

| | |
|---|---|
| **A.** | **Mainstreaming Climate Change Adaptation and Mitigation Initiative in Agriculture (AMIA)**<br>● Conduct policy studies to increase understanding on strategies, impact and issues on mainstreaming climate change across functions and agencies in the DA.<br>● Develop systems, procedures and protocols to enhance managerial and technical capacities and determine policy impacts to increase policy implementation, efficiency and accountability.<br>● Develop communication materials, stakeholder consultations and partnership activities to inform stakeholders and increase their support. |
| **B.** | **Climate Information System (CIS)**<br>● Common database to generate timely and reliable data for disaster risk reduction, planning, and management.<br>● Conduct vulnerability and risk-assessment mapping of productive areas and pest population surveys.<br>● Improvement and establishment of early warning and agro-meteorological systems. |
| **C.** | **Philippine Adaptation & Mitigation in Agriculture Knowledge Toolbox (R&D)**<br>● Inventory, generate, and disseminate adaptive tools, technologies, and practices.<br>● Pursue new tools and knowledge in partnership with the scientific community.<br>● Breeding and screening for climate resilient crops and tolerant livestock and poultry.<br>● Assessment of adoption rates and effectiveness of adaptation and mitigation measures. |
| **D.** | **Climate-Resilient Agriculture Infrastructure**<br>● Improvement of infrastructure design standards and construction protocols.<br>● Development of new climate resilient infrastructure and repair of existing infrastructure.<br>● Improvement of the design and management of irrigation systems to reduce leakage and optimise water use.<br>● Increase in number of climate-resilient production and postharvest facilities, including fishery infrastructure.<br>● Repair and improvement of irrigation systems and establishments of Small Water Impounding Projects (SWIPs) and Small Farm Reservoirs (SFRs). |
| **E.** | **Financing and Risk Transfer Instruments on Climate Change**<br>● Develop new innovative financing schemes. |
| **F.** | **Climate-Resilient Agriculture & Fisheries Regulations**<br>● Redesign the services of the DA regulatory agencies to take into consideration new technologies.<br>● Promote climate-smart agriculture.<br>● Ensure that new and more resilient crop varieties, pesticides, fertilisers, and other inputs comply with effectiveness and safety standards. |
| **G.** | **Climate-Resilient Agriculture and Fishery Extension System**<br>● Ensure widespread adoption of early-warning systems for weather changes.<br>● Evacuation protocol and centres during strong tropical cyclones.<br>● Identification of alternative agricultural settlements.<br>● Improved agri-fishery infrastructure design standards and construction protocols.<br>● Rain water harvesting and storage; SWIP irrigation.<br>● Soil moisture retention practices such as mulching, use of cover crops.<br>● Balanced fertilisation.<br>● Organic farming tools and practices.<br>● Soil and water conservation practices.<br>● Highly efficient farm irrigation methods such as drip irrigation and intermittent irrigation. |

*Source:* DA (2013b), Memorandum: Mainstreaming Climate Change in the DA Programs, Plans & Budget, Climate Change Policy and Implementation Program 2013.

## Table 3.A1.3. **Specification of extreme climate event scenarios**

| Scenario | Yield Shock | Trade Policy |
|---|---|---|
| Reference | No yield shock | Baseline tariffs (18% on rice) |
| Philippine Typhoon | In the Philippines:<br>● Banana declines by 10%<br>● Coconut[1] production declines by 10%<br>● Maize declines by 15%<br>● Rice production declines by 20%<br>● Increase in marketing margins to target domestic price increases between 5% and 10% | No change in tariffs from Reference |
| Philippine Typhoon without rice import restriction | | Set import tariffs on rice to 0 |
| Global El Niño | For wheat:<br>● Declines of 25%, 10%, 10% and 20% for Australia, China, USA, and Mexico respectively<br>For maize:<br>● Declines of 5%, 10% and 10% for China, USA, and the Philippines respectively<br>For rice:<br>● Declines of 5%, 5%, 10%, 10%, 20% and 10% for India, China, Indonesia, Thailand, Viet Nam, and the Philippines respectively. | No change in tariffs from Reference |
| Global El Niño without rice import restriction | | Set import tariffs on rice to 0 |

1. In IMPACT coconuts are aggregated into the group "other oilseeds".

*Source:* Authors' specification of scenarios.

## Table 3.A1.4. **PhilRice – Climate Change-Ready Technologies for Rice and Rice-Based Farming: List of technologies identified and promoted by PhilRice as climate change adaptation options for farmers**

PhilRice is a government-owned and controlled institute, co-ordinating the national R&D programme for rice and rice-based farming systems. PhilRice has made important progress in selecting, developing and publicising more climate-resilient rice varieties and production technologies, including technologies aimed at increasing water efficiency and at diversifying farmers´ income sources (PhilRice, 2015). It works closely with the International Rice Research Institute (IRRI), which develops better and healthier varieties and works on technology transfer. The IRRI has developed various training materials and technologies, which are now promoted for adoption among farmers in the Philippines. Examples include: water saving technologies, such as AWD (Box 3.5), and The Rice Crop Manager (RCM), a tool that delivers site-specific recommendations on crop management to farmers via their mobile phones (IRRI, 2015).

**Selected adaptation technologies supported by PhilRice**

***Rice varieties with some resistance to climate-related stresses***

- Drought-tolerant varieties under conditions where the crop is dry-seeded or when rainfall maybe nil or delayed. Varieties include: PSB Rc14, PSB Rc68, NSIC Rc9, NSIC Rc222, NSIC 2011 Rc272 (Sahod Ulan 2), NSIC 2011 Rc274 (Sahod Ulan 3), NSIC 2011 Rc278 (Sahod Ulan 5), NSIC 2011 Rc284 (Sahod Ulan 8), NSIC 2011 Rc286 (Sahod Ulan 9), NSIC 2011 Rc288 (Sahod Ulan 10), NSIC 2013 Rc346 (Sahod Ulan 11), NSIC 2013 Rc348 (Sahod Ulan 12).
- Water submergence-tolerant varieties: PSB Rc18 (Ala) can withstand 4 days of complete submergence to flood, for instance during typhoons, ii) PSB Rc18, NSIC Rc194 (Submarino 1) can survive, grow and develop even after 10 days of complete submergence at vegetative state, PSB Rc68 (Sacobia) drought resistance with some degree of submergence tolerance trait.
- Saline-resistant varieties which can grow in areas with moderate salinity level: NSIC Rc182 (Salinas 1), NSIC Rc184 (Salinas 2), NSIC Rc186 (Salinas 3), NSIC Rc188 (Salinas 4), NSIC Rc190 (Salinas 5), NSIC 2011 Rc290 (Salinas 6), NSIC 2011 Rc292 (Salinas 7), NSIC 2011 Rc294 (Salinas 8), NSIC 2011 Rc296 (Salinas 9), NSIC 2011 Rc336 (Salinas 16), NSIC 2011 Rc390 (Salinas 19).

***Water- saving technologies that can be used during drought periods***

- Controlled irrigation or Alternate Wetting and Drying (AWD).
- Low-cost drip-irrigation system.

***Fossil-free technologies with GHG mitigation potential***

- Rice hull gasifier-pump system: Recommended for rainfed areas.
- Windmill-pump system: applicable in areas with abundant wind energy.
- Rice hull stove.
- Rice hull carboniser: processes rice hull into biochar, which is used as a soil conditioner and in the production of organic fertilisers and which contributes to carbon sequestration.

***Diversified system of farming: Technologies for diversifying sources of income as a strategy for enhancing farmers´ resilience to climate change***

- *Palayamanan* plus: highly integrated and diversified system of farming where rice is grown with other crops and livestock and makes productive use of agricultural waste.
- Rice-duck system: combining rice-growing with duck farming to diversify farmers' sources of income.
- Floating gardens: growing vegetables in floating beds, applicable in swampy and flood-prone areas, to enhance household food security.

***Harvest and post-harvest technologies that help prevent losses during typhoons or periods of continuous rains***

- Mini rice combine harvester: allows fast and timely harvesting and threshing of rice to evade possible damage due to forthcoming typhoons.
- Flatbed paddy dryer: allows drying of wet paddy during typhoons or rainy days.
- Hermetic seed storage (SACLOB): ensures quality preservation of paddy seeds against the harmful effects of high humidity during the rainy season.

*Source:* PhilRice (2015).

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