PART I

Setting up the Scenarios: Current Status and Potential Impacts of Climate Change to Philippine Agriculture

1

CURRENT STRUCTURE AND FUTURE CHALLENGES OF THE AGRICULTURAL SECTOR

Majah-Leah V. Ravago, Arsenio M. Balisacan and Mercedita A. Sombilla

After a period of lacklustre performance in the 2000s, the Philippine economy improved considerably during 2010–14. The Aquino Administration (2010–16) has anchored a platform of sustainable and inclusive growth that incorporates fighting corruption, pursuing peace and order, and instituting governmental reform. Average yearly growth during 2010–14 was 6.2 per cent — the country's highest five-year average in forty years (peaking at 7.2 per cent in 2013). This pace of growth has put the country among the fastest growing developing economies in the world, resulting in unprecedented upgrades in credit and investment ratings. Progress, however, is slower in the social sector. Poverty is high and, so far, has responded sluggishly to economic growth. Underemployment also remains high at close to 20 per cent. Clearly, much work remains to be done.

Sustaining economic growth over the medium to long term requires structural transformation — especially involving a shift from low-productivity areas and sectors to high ones. Raising agricultural

productivity is a key contributor. Although agriculture's share of the economy has continued to decline with economic development, enormous opportunities exist for income growth and poverty reduction in response to rapidly changing Asian food markets. Nevertheless, policy and governance constraints have limited Filipino farmers' ability to seize these opportunities. Basic reforms are required to facilitate and strengthen agriculture's contribution to the Philippine economy.

This chapter provides an overview of the patterns, composition, policies, and institutional framework that have influenced the performance of the agricultural sector in recent years. The focus is the changing dynamics of agricultural supply and demand — as a whole and for key commodities — in the context of a growing economy, urbanization, and regional market integration. The chapter concludes with a discussion of the policy and institutional challenges inherent in enabling agriculture to form a key pillar in the country's pursuit of inclusive growth, poverty reduction, and sustainable development.

AGRICULTURE IN THE CONTEXT OF STRUCTURAL TRANSFORMATION

The decline of agriculture in response to economic development has been widely documented in the literature following the works of Clark (1940), Kuznets (1966), and Chenery and Syrquin (1975), using both cross-sectional and time-series data. The pattern is quite "uniform and pervasive" (Timmer 1988, p. 276), be it in socialist or capitalist countries in Asia, Latin America, or Africa. The "flying geese" metaphor exemplifies this pattern, describing Japan as the lead goose in structural transformation, followed by the new industrializing economies of Hong Kong, Singapore, South Korea, and Taiwan; then Malaysia, Thailand, and Indonesia; with the Philippines and Vietnam trailing behind (Ravago, Roumasset, and Balisacan 2010). The development process also requires that general economic growth be accompanied or preceded by rapid agricultural growth (Timmer 1988). Moreover, structural transformation involves a seeming paradox, whereby the declining importance of agriculture must be preceded or accompanied by rapid productivity growth in the sector.

Anderson (1986) characterizes the underlying economic forces behind the structural transformation for a small, open economy. At the initial stage of development, the economy is largely agricultural, labour is employed

mainly on the farm, and food exports defray the cost of manufactured imports. At this stage, nonfarm capital is low, per capita land endowment determines average incomes, and capital accumulation and innovation barely surpass diminishing labour productivity and the pressure of population growth. However, population growth also induces innovation and specialization within the agricultural sector (Boserup 1965, 1981). This, together with capital accumulation, eventually leads to the emergence of industrialization, whereby labour is released from the low-productivity areas of agriculture to high-productivity areas of manufacturing, and the surplus from agricultural development, combined with reinvestment of the profits from manufacturing, creates capital accumulation.

This facilitates labour-intensive manufacturing industries in becoming internationally competitive. The process gradually shifts the country's composition of export trade from primary agriculture to manufactured products. The lower the ratio of land per worker, the faster the emergence of the manufacturing sector, the faster the decline in the ratio of agricultural exports to imports, and the more rapid the technological progress from farm to nonfarm activities. Thereafter, the faster the accumulation of industrial capital, the faster the decline in agriculture's comparative advantage, and the faster the decline in agriculture's employment share. Specialization and capital accumulation together increase the returns to human capital formation, lowering population growth, which then enhances the virtuous circle of industrial revolution (Lucas 1993, 2001).

The final stage of structural transformation is often referred to as "deindustrialization", whereby the services sector grows relative to industry. As household incomes rise, a higher proportion of that income is spent on services, many of which are domestically produced because they are largely nontradable.[1] In addition, the services sector is relatively labour-intensive, which explains the eventual movement of the workforce out of manufacturing and agriculture. Furthermore, this reinforces the decline of agriculture's shares of output and employment as development proceeds.

Anderson (1986) draws two important conclusions from this simple, open, and growing model of the economy. First, while agricultural products are the most important exports at the beginning of the growth process, the reverse may eventually occur as agriculture becomes an import-competing sector. It is also likely that the country will become a net food importer and that (given land endowments) the higher the population growth, the sooner this will occur. Second agricultural employment and output will

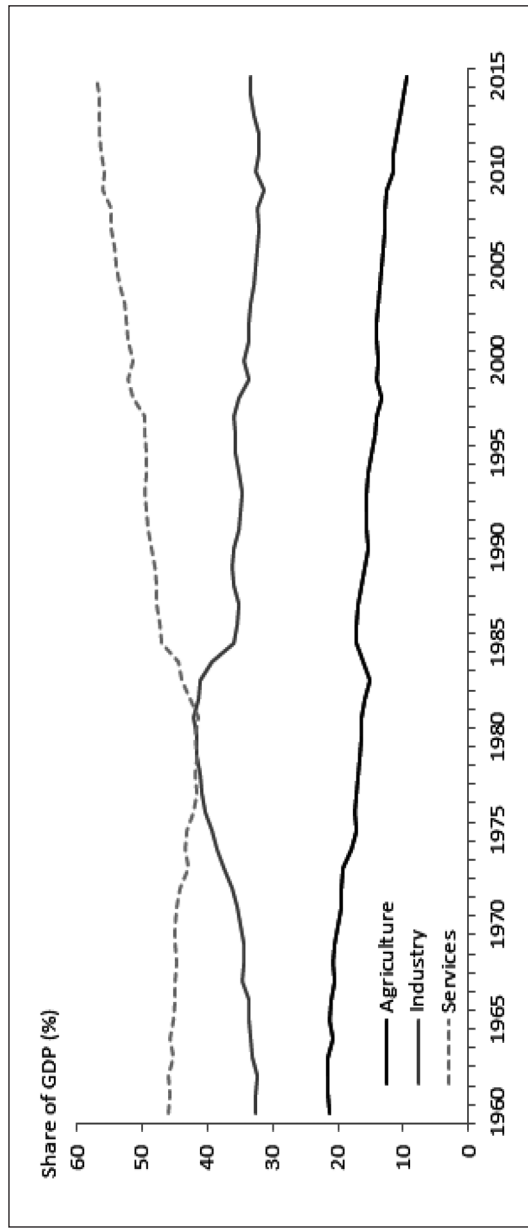
grow relatively slower as both the industrial and services sectors expand, making agriculture relatively less important to the economy. Relatedly, as incomes increase, food expenditures decline as a share of household expenditures. Hence, as development proceeds, food prices increasingly become a less important determinant of household welfare.

Recent development experience also ties sustained poverty reduction to structural transformation (Dollar and Kraay 2002; Besley and Cord 2006; Timmer 2007). The movement of labour from low-productivity to high-productivity areas or sectors of the economy is a key factor in reducing poverty, especially in Asia. Such movement is also associated with sustained overall economic growth — so the empirically observed link between overall economic growth and poverty reduction is not surprising (Dollar and Kraay 2002). Similarly, the response of national poverty reduction to growth (growth elasticity) is found to be even higher, empirically, in cases where agricultural growth is robust (Timmer 2005; Timmer and Akkus 2008). Despite important role of agriculture in facilitating structural transformation and poverty reduction, a mix of market failures and political economy issues stifles the sector's potential and undermines development efforts. The politics, institutions, and laws that shape agricultural protection (or the lack of it) is itself also a consequence of structural transformation (Anderson 1986; Anderson, Hayami, and Honma 1986; Balisacan and Roumasset 1989; Timmer 2007).

Structural Transformation in Output

The Philippine experience is unique and did not follow the development experience of many countries. The country largely skipped the primary engine of growth: manufacturing for export (Balisacan and Hill 2007; de Dios and Williamson 2015). The share of industrial gross domestic product (GDP) fell from an average of 38 per cent in the 1980s to 35 per cent in the 1990s, and 33 per cent in 2000s (Figure 1.1). Similarly, agriculture's share of total output fell from 16 per cent in the 1980s to 15 per cent in the 1990s, to 13 per cent in the 2000s. On the other hand, the corresponding share of the services sector expanded from 45 per cent in the 1980s, to 50 per cent in the 1990s, and to 54 per cent in the 2000s. The declining trend in the agricultural sector and the expansion in the services sector continued in recent years with average shares of 10.5 and 56.7 per cent, respectively, in 2011–15; however, industry's average share of GDP remained at about

FIGURE 1.1
Composition of Gross Domestic Product, 1960–2015



Note: "Agriculture" includes hunting, forestry, and fishing.
Source: Constructed by authors from PSA (Philippine Statistics Authority), "National Income Accounts", various years [f] <www.psa.gov.ph/> (accessed 16 May 2017).

33 per cent during this period. The levelling out of the manufacturing sector during that time could reflect the government's efforts to rebalance the sources of economic growth, in particular drawing more growth from industry, especially manufacturing, investment, and exports, while reducing dependence on household consumption and services.

Moreover, in the past three decades the economy shifted from agriculture towards an expanded services sector, skipping industrial development and deviating from the previously described experience of recently developed economies, particularly in East Asia. While growth in the Philippines has been restrained, South Korea's has accelerated. Lucas (1993) refers to the continuing transformation of South Korea as a miracle, similar to what transpired in Hong Kong, Singapore, and Taiwan.

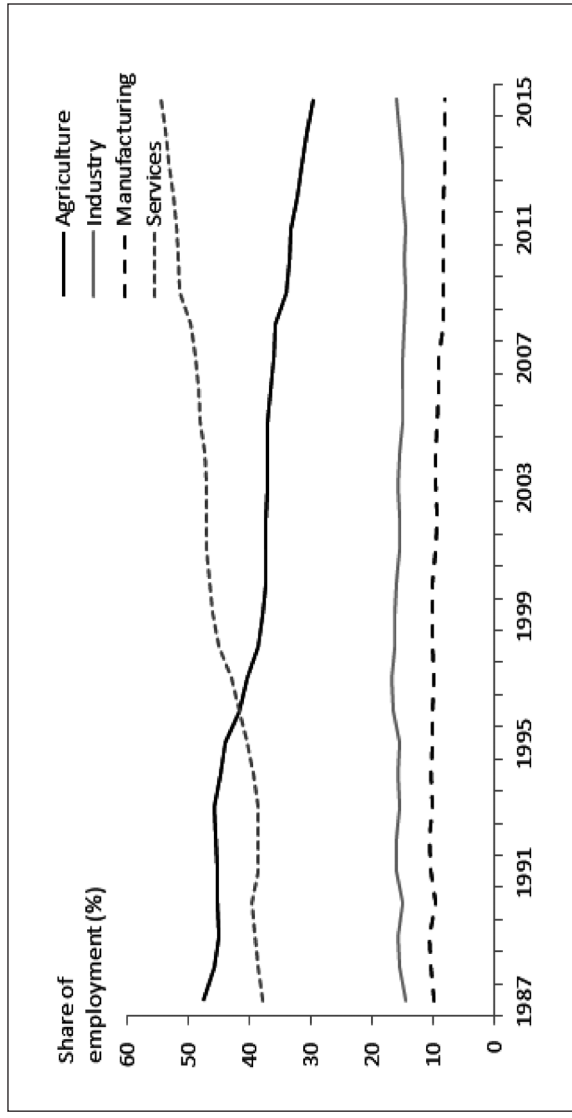
Structural Transformation in Employment

Structural transformation in employment follows the development process in output, albeit with an expected time lag (Figure 1.2). Agriculture had been the largest provider of employment nationwide in the 1980s, at 51 per cent; however, its average share of total employment fell to 40 per cent in the late 1990s and to 32 per cent during 2010–15. As the services sector expanded in the 1980s it attracted labour away from agriculture, eventually exceeding agricultural employment in 1996. The sector's share of employment continued to rise to an average of 48.2 per cent in 2000s and 52.6 per cent during 2010–14. While industry, which includes manufacturing, is responsible for a substantial share of output, it has the lowest share of employment, and shares remained constant at 15 per cent for the three decades leading to 2014.

As previously discussed, growth in agriculture is required to stimulate growth in industry, which in turn generates high-quality employment, even for unskilled workers associated with manufacturing. The country's experience had been perverse, however, with employment moving out of the low-productivity agricultural sector into an equally low-productivity services sector. Labour productivity in agriculture is the lowest among the sectors and has stagnated (Figure 1.3). Labour productivity in the services sector has also stagnated, but improved in recent years. In contrast, labour productivity in industry has grown, especially in recent years.

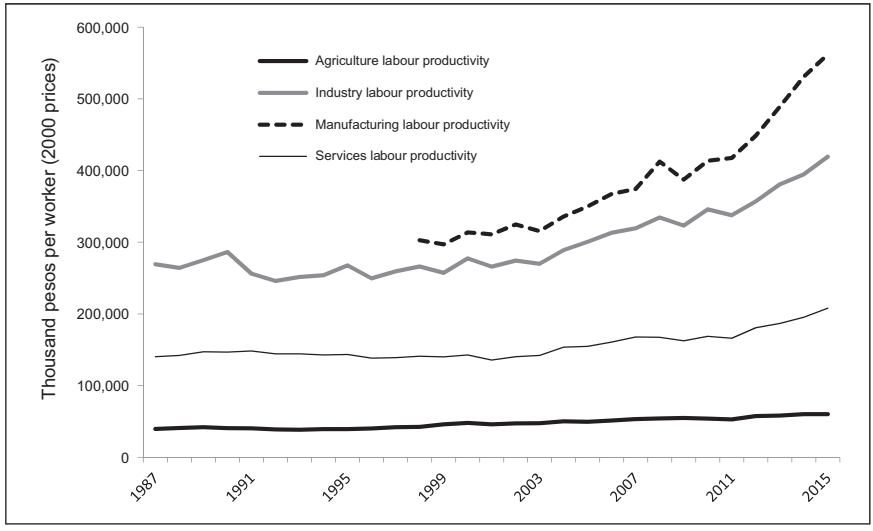
The share of paid agricultural employment grew from 2000 onward to average 27 per cent during 2009–11, whereas the average share of self-

FIGURE 1.2
Composition of Employment, 2000–15



Note: Data for 2014 exclude Leyte due to the onset of typhoon Haiyan (Yolanda).
Source: Constructed by authors from PSA (Philippine Statistics Authority), "Labor Force Survey", October round, various years [d] <www.psa.gov.ph/statistics/survey/labor-force> (accessed 16 May 2017).

FIGURE 1.3
Labour Productivity, 1987–2015



Note: Labour productivity is calculated as the gross value-added divided by the number of workers.
Source: Constructed by authors from PSA (Philippine Statistics Authority), "Labor Force Survey", October round, various years [d] <www.psa.gov.ph/statistics/survey/labor-force> (accessed 16 May 2017).

employed (that is, "unpaid") agricultural workers declined to about 25 per cent in recent years, indicating improvement in the quality of agricultural employment (Table 1.1). The ratio of male to female agricultural workers remained stable at 3 to 1. About two-thirds of those employed in the sector were under 45 years old. The share of workers under 25 years old remained relatively stable in the ten years to 2015; however, it should be noted that this age bracket constituted about 50 per cent of the agricultural workforce in the 1980s and 1990s (Ravago and Cruz 2004). The recent decline implies the sector is considerably less attractive to the younger generation.

Creating opportunities for productive employment is critical to the country's sustained economic growth and poverty reduction goals. At the turn of the millennium, the Filipino workforce comprised about 31 million people (Table 1.2), representing about 70 per cent of the economically active population (those 15–64 years old). Of the 31 million Filipinos able to work, only 28 million had work in the 2000s; those remaining were either unemployed or underemployed. As of 2012–15, the pool of

TABLE 1.1
Characteristics of Agricultural Workers, 2001–15

Characteristic	*2001*	*2004*	*2007*	*2010*	*2012*	*2014*	*2015*
Location (%)							
Urban	16.42	15.74	15.36	15.21	14.73	14.92	14.65
Rural	83.58	84.26	84.64	84.79	85.27	85.08	85.35
Category (%)							
Wage/salary earners	22.72	24.99	23.23	27.00	31.93	30.91	29.81
Self-employed	47.21	48.7	50.63	47.55	45.92	45.9	48.26
Unpaid family workers	30.07	26.31	26.14	25.45	22.15	23.19	21.94
Gender (%)							
Male	74.27	75.18	74.58	74.48	74.91	74.16	74.63
Female	25.73	24.82	25.42	25.52	25.09	25.84	25.37
Age (%)							
15–19 years	10.99	10.66	10.98	10.31	10.29	9.95	8.97
20–24 years	8.95	10.12	9.09	9.03	9.18	9.01	9.21
25–34 years	16.09	20.76	21.39	19.42	21.56	20.94	21.7
35–44 years	20.22	20.34	20.59	21.15	20.09	21.02	21.79
45–54 years	17.15	15.83	16.84	18.18	17.26	17.46	18.56
55–64 years	12.17	10.33	10.69	11.62	11.56	11.53	12.34
65 years and over	7.23	6.28	6.47	6.74	6.51	6.38	7.43
Total number of workers included (thousands)	10,426	10,159	12,497	12,515	12,373	12,502	11,761

Notes: Category of worker excludes observations for categories not reported. Data for 2012 are from the July survey round; 2014 data exclude Leyte due to typhoon Haiyan (Yolanda).
Source: Calculated by authors from PSA (Philippine Statistics Authority). "Labor Force Survey." October round. Various years [d]. <www.psa.gov.ph/statistics/survey/labor-force> (accessed 16 May 2017).

workers had expanded to 41 million, comprising 38 million employed and 2.9 million unemployed. The Philippine Statistics Authority (PSA) defines "unemployed" as people in the labour force who had no job or business and did not work during the reference period but were reportedly looking for work; "underemployed" comprises employed people with the expressed desire for additional hours of work in their current job, in an additional job, or in a new job with longer hours.

In terms of growth, the labour force expanded from 1990 until 2000, but growth decelerated thereafter. Employment growth fluctuated, and the unemployment rate fell from a high of 10.7 per cent in 2000 to 7.1 per cent in 2013. Underemployment remained high during this period, at about 20 per cent.

TABLE 1.2
Labour Trends, 1990–2014

Employment Category	*1990*	*1995*	*2000*	*2005*	*2010*	*2012*	*2013*	*2014*
Labour force (thousands)	24,665	28,589	31,493	35,537	38,930	40,426	41,022	41,229
Growth rate (%)	3.0	3.4	3.4	0.9	2.8	1.0	1.5	0.7
Number of employed (thousands)	22,345	25,965	28,117	32,187	36,096	37,600	38,118	38,503
Growth rate (%)	2.6	3.7	3.1	2.1	3.0	1.1	1.4	1.4
Employment rate (%)	90.6	90.8	89.3	90.8	92.7	93	92.9	93.5
Unemployment rate (%)	9.4	9.2	10.7	7.8	7.3	7.0	7.1	6.5
Underemployment rate (%)	22.7	20.8	20.3	20.4	19.1	20.0	19.3	18.3

Notes: Data are three-year averages centred on the year indicated. The unemployment rate for 2005 refers to 2005 only due to a change in PSA's definitions that year.
Source: Calculated by authors from PSA (Philippine Statistics Authority), "Labor Force Survey", October round, various years [d] <www.psa.gov.ph/statistics/survey/labor-force> (accessed 16 May 2017).

Structural Transformation in Trade

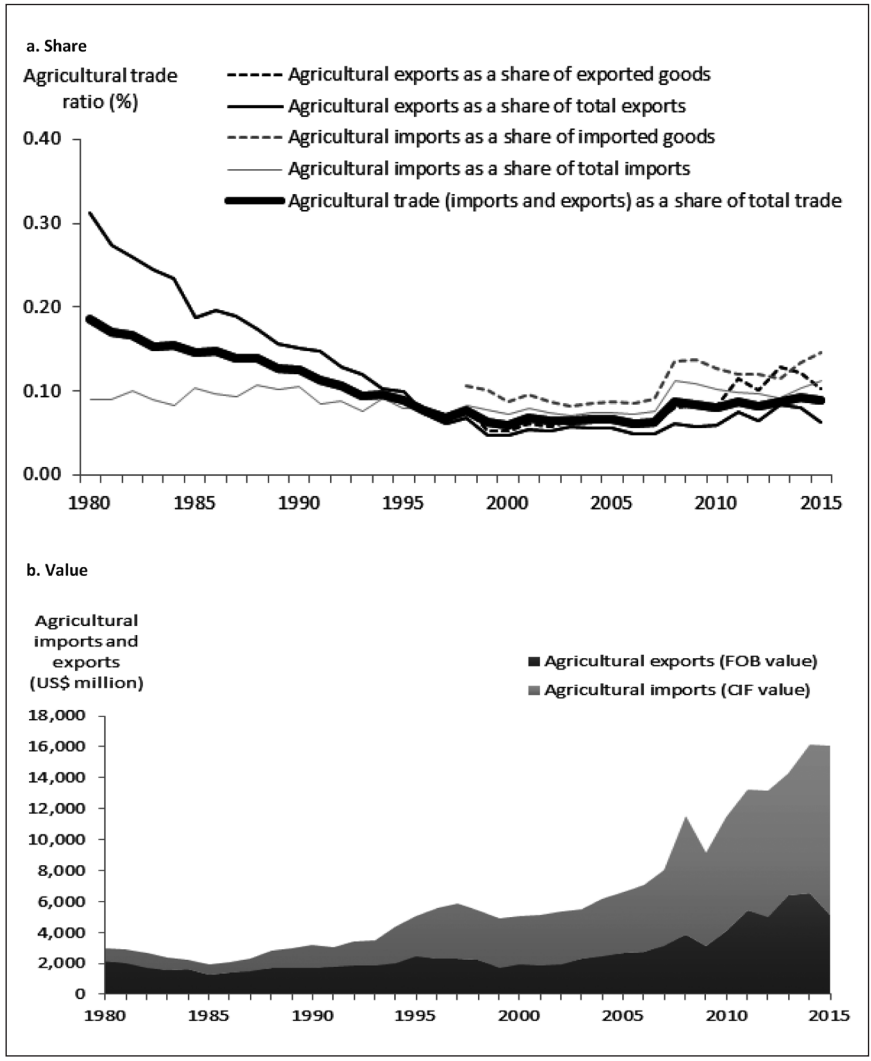
The structural transformation in Philippine trade followed the same development patterns exhibited in output and employment. In the 1980s, 1990s, and 2000s, agricultural shares of total trade averaged 15, 9, and 7 per cent, respectively, mainly driven by sharp contractions in agriculture's share of total exports during 1980–2000 (Figure 1.4, panel a). Agriculture's share of imports followed a series of peaks and troughs within a somewhat stable band. During 2010–15, agriculture's yearly share of total trade averaged 9 per cent, driven by the agricultural share of total imports, which averaged 10 per cent. Nevertheless, in absolute terms, trade in agricultural products more than doubled from a yearly average of US$2.6 billion during 1980–90 to US$7.4 billion during 2000–10. During 2011–15, trade in agricultural products averaged US$14.6 billion per year (Figure 1.4, panel b).

The composition and shares of major agricultural imports and exports have also changed over the years (Tables 1.3 and 1.4). The country's major exports, including coconut oil, bananas, sugar, pineapples, and tuna, accounted for 50 per cent of the agricultural export value in 2013–15. Coconut oil remains the most valuable export product; bananas declined in importance in 2010 but rebounded thereafter.

In terms of the composition of the country's major imports, wheat and meslin recorded the highest import value during 2013–15, followed by milk, cream, and related products (Tables 1.5 and 1.6). Rice, the country's staple, ranked fourth, with its imports registering the largest share of total agricultural imports during 2013–15. The trend in rice imports was closely linked with the government's food sufficiency policy, which is discussed later in this chapter.

The country's major agricultural trading partners include members of the Association of Southeast Asian Nations (ASEAN) — particularly Brunei, Indonesia, Malaysia, Singapore, and Thailand — as well as Australia, the European Union, Japan, and the United States (Table 1.7). In 2008–13, a substantial share of Philippine agricultural imports (19 per cent) and exports (24 per cent) came from and went to the United States; 13 per cent of agricultural exports went to Japan. Trade with the ASEAN member countries has also been significant. In 2013–15, agricultural exports to ASEAN neighbors averaged 13 per cent, whereas imports averaged 22 per cent. As in the past ten years, the Philippines generated surpluses from trade in agricultural products with the European Union and Japan.

FIGURE 1.4
Value and Share of Agricultural Trade, 1980–2015



Notes: "Total exports" and "total imports" include both goods and services, whereas "goods" only includes merchandise. FOC = free on board; CIF = cost, insurance, and freight.
Source: Constructed by authors from PSA (Philippine Statistics Authority), "Import/export data", various years [c] <http://countrystat.psa.gov.ph/?cont=12&pageid=59555B5A1D737166767A78671D056D677A1D066C77667D646118056D74617B64611A4A5A58> (accessed 16 May 2017).

TABLE 1.3
Value of Major Philippine Exports, 2001–14

	2001	*2005*	*2010*	*2014*
Commodity Ranking in 2013		*(US$ million)*		
Coconut oil	411	605	1,095	1,131
	(21.01)	(16.02)	(25.44)	(19.04)
Bananas	299	364	378	917
	(15.29)	(9.87)	(9.17)	(15.04)
Centrifugal sugar	n.a.	n.a.	143	n.a.
			(2.91)	
Pineapple and products	155	201	282	478
	(7.94)	(5.47)	(6.88)	(8.16)
Tuna	131	134	336	511
	(6.67)	(3.23)	(8.43)	(8.38)
Desiccated coconut	77	122	195	204
	(3.93)	(3.40)	(4.56)	(3.37)
Seaweed and carrageenan	76	78	155	226
	(3.88)	(1.89)	(3.61)	(3.76)
Tobacco, manufactured	n.a.	n.a.	157	260
			(3.71)	(4.30)
Fertilizer, manufactured	45	80	130	n.a.
	(2.30)	(1.88)	(3.06)	
Milk, cream, and related products	n.a.	n.a.	136	65
			(3.21)	(1.12)
Value of total agricultural exports	1,958	8,660	4,207	6,025
	(100)	(100)	(100)	(100)

Notes: Values are three-year moving averages centred on the year indicated; figures in parentheses indicate shares of the total value of agricultural exports; n.a. indicates that data were not available.
Source: Calculated by authors from PSA (Philippine Statistics Authority), "Import/export data", various years [c] <http://countrystat.psa.gov.ph/?cont=12&pageid=59555B5A1D737166767A78671D056D677A1D066C77667D646118056D74617B64611A4A5A58> (accessed 16 May 2017).

SOURCES OF AGRICULTURAL GROWTH

Output Growth

Agricultural value-added growth rates reflect structural transformation within the agricultural sector (Table 1.8). The major growth drivers are the livestock and poultry, fisheries, and crop subsectors — registering average yearly growth of 4.1, 4.4, and 4.3 per cent, respectively, during 2000–05. Growth proved to be short-lived, however, with decelerations

TABLE 1.4
Volume of Major Philippine Exports, 2001–14

	2001	*2005*	*2010*	*2014*
Commodity Ranking in 2013	*(thousand metric tons)*			
Coconut oil	1,133	1,059	1,003	931
Bananas	1,628	2,042	1,767	2,768
Centrifugal sugar	n.a.	n.a.	253	…
Pineapple and products	458	583	490	732
Tuna	70	61	99	94
Desiccated coconut	87	123	111	57
Seaweed and carrageenan	45	35	35	34
Tobacco (manufactured)	n.a.	n.a.	23	27
Fertilizer (manufactured)	317	373	361	…
Milk and cream and products	n.a.	n.a.	33	18

Notes: Values are three-year moving averages centred on the year indicated; ellipses indicate that the commodity was not ranked in the top ten in 2013; n.a. indicates that data were not available.
Source: Calculated by authors from PSA (Philippine Statistics Authority), "Import/export data", various years [c] <http://countrystat.psa.gov.ph/?cont=12&pageid=59555B5A1D737166767A78671D056D677A1D066C77667D646118056D74617B64611A4A5A58> (accessed 16 May 2017).

in all subsectors during 2006–10 due to weather disturbances, notably Typhoon Ketsana in 2009. Overall, the performance of the sector was volatile and erratic in more recent years; the growth of livestock and fisheries subsectors further decelerated at 2.2 and –0.5 per cent per year on average, respectively, during 2011–15. The forestry subsector reversed its growth trend — contributing positive, albeit small, growth to the sector — but its relative importance has since declined to represent less than a 1 per cent share of gross agricultural value-added.

In terms of sectoral shares, crops continued to dominate, representing about 50 per cent of agricultural value-added between 2000 and 2015 (Table 1.8). The fisheries subsector remained relatively stable over this timeframe, increasing its average share of agricultural value-added from 15 per cent in the early 2000s to 19 per cent in 2011–15.

In real terms, trends in the crop subsector mirror those of the agricultural sector as a whole, declining in 2008 and reaching a plateau towards the end of the period (Figure 1.5). Fisheries and livestock and poultry followed an increasing trend from 2000 until 2015, whereas, forestry was far more volatile. The major subsectors are discussed in more detail below.

TABLE 1.5
Value of Major Philippine Agricultural Imports, 2001–14

	2001	*2005*	*2010*	*2014*
Commodity Ranking in 2013		*(US$ million)*		
Wheat and meslin	409.89	430.48	773	1,073
	(14.01)	(10.77)	(11.06)	(11.32)
Milk, cream, and related products	344.04	403.83	556	722
	(11.82)	(10.21)	(7.76)	(7.78)
Soybean oil/cake meal	197.26	352.52	456	873
	(6.73)	(8.93)	(6.48)	(9.25)
Rice	147.21	442.68	1,025	414
	(5.00)	(11.00)	(14.86)	(4.17)
Fertilizer, manufactured	n.a.	n.a.	253	341
			(3.53)	(3.66)
Meat, bovine	85.19	118.84	191	299
	(2.93)	(3.01)	(2.68)	(3.14)
Urea	69.80	102.67	196	227
	(2.41)	(2.57)	(2.79)	(2.44)
Tobacco, manufactured	77.86	178.73	156	165
	(2.69)	(2.57)	(2.27)	(1.74)
Coffee	n.a.	n.a.	109	253
			(1.53)	(2.66)
Total value of agricultural imports	2,919.23	3,976.85	7,062	9,509
	(100)	(100)	(100)	(100)

Notes: Values are three-year moving averages centred on the year indicated; figures in parentheses indicate shares of the value of total agricultural exports; n.a. indicates that data were not available.
Source: Calculated by authors from PSA (Philippine Statistics Authority), "Import/export data", various years [c] <http://countrystat.psa.gov.ph/?cont=12&pageid=59555B5A1D737166767A78671D056D677A1D066C77667D646118056D74617B64611A4A5A58> (accessed 16 May 2017).

Crops

While crop production represents the largest share of agricultural output, its rate of growth in the recent decade was among the slowest. Growth was negative from 2006–10 (Table 1.8), in part because the expansion of arable land slowed down dramatically. Adding to the deceleration of crop production was a series of natural disasters and droughts. Of the crops constituting the overall growth trend, *palay* (unmilled rice grain) and corn, did fairly well (Table 1.9). Negative growth of the crops subsector during 2006–10 was driven by a slump in sugarcane and other crops (together

TABLE 1.6
Volume of Major Philippine Imports, 2001–14

	2001	*2005*	*2010*	*2014*
Commodity Ranking in 2013	*(thousand metric tons)*			
Wheat and meslin	2,875	2,293	2,589	3,446
Milk, cream, and products	252	275	273	308
Soybean oil/cake meal	1,064	1,317	1,432	1,820
Rice	881	1,513	1,614	990
Fertilizer, manufactured	n.a.	n.a.	804	1,083
Meat, bovine	81	99	87	93
Urea	630	546	579	694
Tobacco, manufactured	23	65	46	47
Coffee	n.a.	n.a.	58	n.a.

Note: Values are three-year moving averages centred on the year indicated; n.a. indicates that data were not available.
Source: Calculated by authors from PSA (Philippine Statistics Authority), "Import/export data", various years [c] <http://countrystat.psa.gov.ph/?cont=12&pageid=59555B5A1D737166767A78671D056D677A1D066C77667D646118056D74617B64611A4A5A58> (accessed 16 May 2017).

constituting less than 40 per cent of all crops). In Table 1.9, the growth rate of bananas (7.45 per cent) overtook that of *palay* (1.18 per cent) in 2006–10, largely due to improved farm practices. Nevertheless, growth in banana production hit an all-time low in 2011–15 (–0.62) due to external factors, such as pest infestation. This, combined with deep troughs recorded for coconuts, drove the deceleration of growth during 2006–15.

Livestock and Poultry

The contribution of livestock and poultry to gross agricultural value-added rose to 23 per cent at the turn of the millennium from an average of 18 per cent in the 1970s. This growth was erratic, however, decelerating during the first half of the decade and recovering only after 2006 (Figure 1.6). The downtrend in the growth of livestock and poultry was attributed to declining production of hogs, carabaos (water buffalo), and cattle during the first three years of the 2000s. Growth in the poultry subsector was relatively faster, reaching about 4.8 per cent per year on average during 2011–15. While the livestock subsector declined sharply in 2007, recording growth of –2.61 per cent, its production rebounded in succeeding years due

TABLE 1.7
Agricultural Trade with Major Partners, 2008–15

Region/Country	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	*2014*	*2015*
	(US$ million)							
Philippines								
Exports	3,889.30	3135.75	4,101.09	5,431.76	5,037.94	6,400.03	6,542.95	5,131.85
Imports	7,684.74	6,079.80	7,399.79	7,839.93	8,168.33	7,931.14	9,631.24	10,965.76
Australia								
Exports	42.00	31.09	35.65	52.32	48.03	49.02	72.00	72.40
Imports	278.80	261.73	260.98	564.21	719.66	340.91	502.30	521.91
Japan								
Exports	527.49	452.86	432.02	653.05	691.85	915.99	944.19	655.33
Imports	176.34	96.83	117.41	138.67	116.17	100.87	108.72	125.60
United States								
Exports	971.68	777.53	961.92	1,454.27	1,203.45	1,466.98	1,505.42	1,329.51
Imports	1,402.16	1,069.04	1,142.38	1,655.15	1,765.35	1,754.83	1,992.34	2,337.95
ASEAN								
Exports	579.68	486.28	608.75	920.71	857.68	964.6	788.19	517.5
Imports	2,795.98	1,970.84	2,863.46	2,186.69	2,206.89	1,956.8	2,754.74	3,344.78
European Union								
Exports	859.63	606.63	1,017.05	1,066.03	911.75	1,048.05	999.36	994.98
Imports	518.37	486.93	587.96	607.94	631.93	738.34	1,066.83	1,110.02
Rest of the World								
Exports	908.82	781.36	1,045.69	1,285.39	1,325.18	1,965.39	2,233.78	1,562.15
Imports	2,513.09	2,194.87	2,427.60	2,687.26	2,728.34	3,039.38	3,206.31	3,525.5

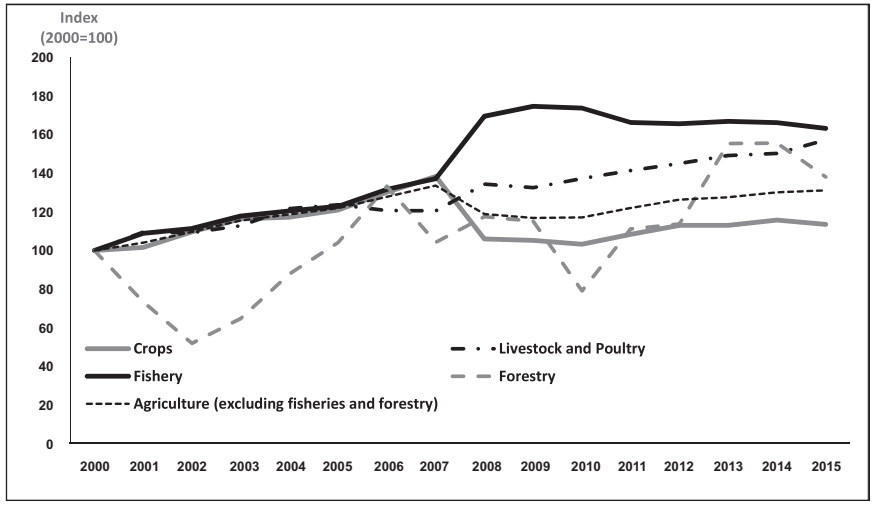
Notes: ASEAN = Association of the Southeast Asian Nations.
Source: Compiled by authors from PSA (Philippine Statistics Authority), "Import/export data", various years [c] <http://countrystat.psa.gov.ph/?cont=12&pageid=59555B5A1D737166767A78671D056D677A1D066C77667D646118056D74617B64611A4A5A58> (accessed 16 May 2017).

TABLE 1.8
Growth Rates of Gross Agricultural Value-Added by Commodity, 2000–15

Commodity	*2000–05*	*2006–10*	*2011–15*
Livestock and poultry	4.1	3.2	2.2
	(22)	(22)	(24)
Fisheries	4.4	7.4	–0.5
	(15)	(18)	(19)
Crops	4.3	–5.7	1.4
	(58)	(54)	(49)
Forestry	3.0	–3.5	9.5
	(0.46)	(0.55)	(0.60)
Total	4.3	–0.6	1.4
	(100)	(100)	(100)

Note: Value-added is calculated in 2000 prices. Figures in parentheses indicate average shares of gross value-added for the period.
Source: Calculated by authors from PSA (Philippine Statistics Authority), "Gross Value Added in Agriculture, Fishery, and Forestry", various years [i] <http://countrystat.psa.gov.ph/?cont=10&pageid=1&ma=E10PNGVA> (accessed 16 May 2017).

FIGURE 1.5
Trends in Real Gross Agricultural Value-Added, 2000–15



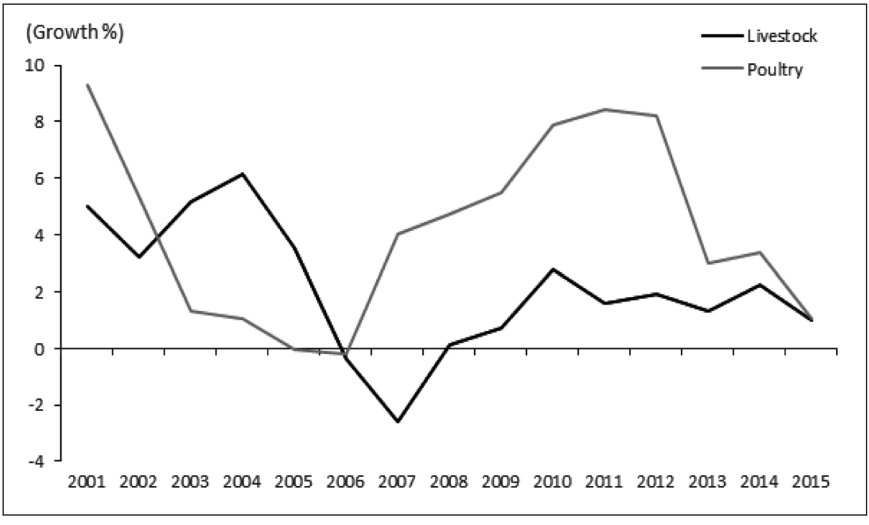
Source: Constructed by authors from PSA (Philippine Statistics Authority), "Gross Value Added in Agriculture, Fishery, and Forestry", various years [i] <http://countrystat.psa.gov.ph/?cont=10&pageid=1&ma=E10PNGVA> (accessed 16 May 2017).

TABLE 1.9
Rate of Growth of Gross Value-Added by Crop, 2000–15

Crop	*2000–05*	*2006–10*	*2011–15*
Palay	3.61	1.18	2.39
	(36.48)	(36.83)	(38.13)
Corn	4.29	2.89	2.53
	(10.28)	(11.93)	(12.41)
Coconuts	3.53	0.99	–1.49
	(9.18)	(8.55)	(7.91)
Sugarcane	2.63	–0.87	–1.17
	(5.87)	(5.03)	(4.91)
Bananas	4.88	7.45	–0.62
	(7.43)	(9.47)	(9.65)
Other crops	2.22	0.48	1.37
	(30.77)	(28.20)	(26.98)
Total	3.28	1.63	1.35
	(100)	(100)	(100)

Note: Value-added is calculated in 2000 prices. Figures in parentheses indicate average shares of gross value-added for the period.
Source: Calculated by authors from PSA (Philippine Statistics Authority), "Gross Value Added in Agriculture, Fishery, and Forestry", various years [i] <http://countrystat.psa.gov.ph/?cont=10&pageid=1&ma=E10PNGVA> (accessed 16 May 2017).

FIGURE 1.6
Rate of Growth Rate of Gross Value-Added for Livestock and Poultry, 2001–15



Note: Value-added is calculated in 2000 prices.
Source: Constructed by authors from PSA (Philippine Statistics Authority), "Gross Value Added in Agriculture, Fishery, and Forestry", various years [i] <http://countrystat.psa.gov.ph/?cont=10&pageid=1&ma=E10PNGVA> (accessed 16 May 2017).

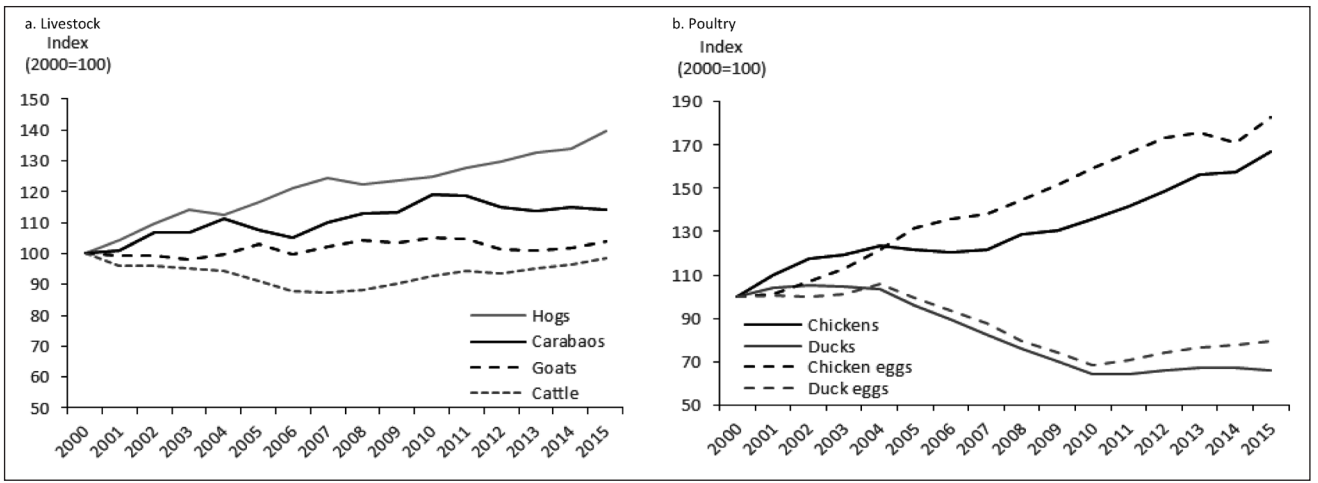
to increased domestic demand, advances in production technology, and incentives for large commercial producers (such as duty-free importation of stock).

Hog and carabao production contributed substantially to the strong performance of the livestock sector during 2000–15 (Figure 1.7, panel a). Hog production dominated the subsector in terms of volume, representing more than three-quarters of livestock production. Carabao production also grew by about 50 per cent over 1990 levels largely because the government intensified livestock distribution in the late 1990s. Goats maintained their popularity as "the poor man's cow", recording relatively stable production. The production of cattle, on the other hand, declined due to the widespread incidence of diseases (such as foot and mouth disease). The economic difficulties of the 1980s prompted a fall in popularity of higher priced pork and beef in favour of chicken and carabeef, and these preferences persisted into the 2000s. Chicken and chicken eggs dominated the poultry subsector, whereas ducks and duck eggs exhibited a downward trend (Figure 1.7, panel b). Chicken production accelerated faster relative to other poultry options despite the 2004 avian flu scare in Southeast Asia (partly due to the country's efforts to contain the virus).

Fisheries

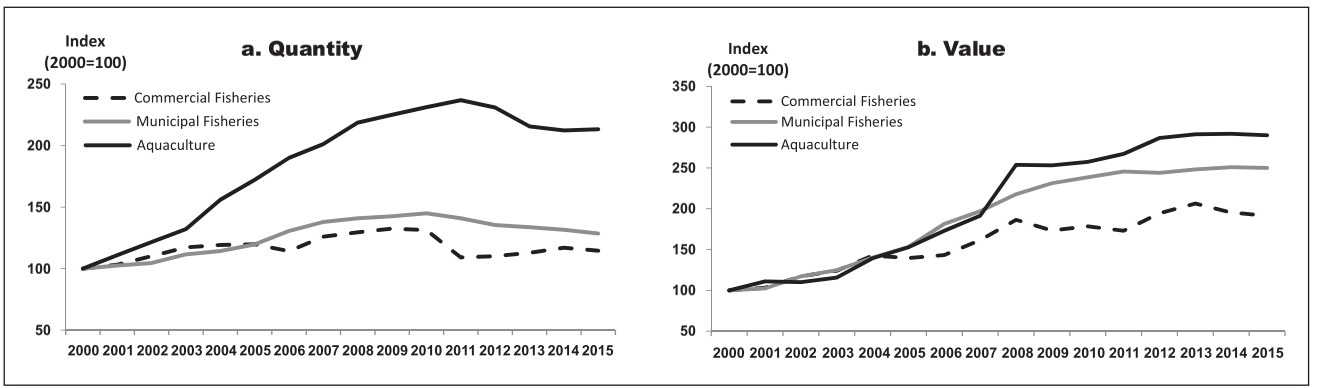
Fishing is one of the most important income- and employment-generating activities in the Philippines, especially in coastal areas. On a positive note, the downtrend in the sector's performance during the 1990s due to rapid depletion of marine and aquatic resources has been turned around, but issues — such as destructive fishing, overfishing, commercial fishing vessels encroaching municipal fishing grounds, massive degradation of mangroves, and pollution of major rivers and lakes — continue to constrain the sector (David 2003). The average rate of growth slowed down during 2011–15 posting an average of –0.5 per cent. Among the three subsectors constituting fisheries, aquaculture represented the largest average share during 2000–15 (47 per cent), whereas municipal and commercial fishing represented 28 and 25 per cent shares, respectively. Aquaculture production accelerated sharply after 2000 in real terms (Figure 1.8, panel a), starting with slow growth from the second half of the 1990s (due to scarce milkfish fries, disease problems in prawn culture, and red-tide episodes in mariculture). Municipal fishing grew in relative importance, exhibiting an upward trend

FIGURE 1.7
Trends in Livestock and Poultry Production, 2000–15



Source: Constructed by authors from PSA (Philippine Statistics Authority), "Production", various years [j] <http://countrystat.psa.gov.ph/?cont=10&pageid=1&ma=B50PNCLP> (accessed 16 May 2017).

FIGURE 1.8
Trends in Fishery Production by Subsector, 2000–15



Notes: PSA defines the three fisheries subsectors as (1) *aquaculture*: operations involving all forms of raising and culturing fish and other species in fresh, brackish, or marine water areas; (2) *commercial fishing*: catching fish using fishing boats with a capacity of more than three gross tons for trade, business, or profit beyond subsistence or sports fishing; and (3) *municipal fishing*: catching fish within municipal waters using fishing vessels of three gross tons or less, or not requiring the use of fishing vessels

Source: Constructed by authors from PSA (Philippine Statistics Authority), "Production", various years [j] <http://countrystat.psa.gov.ph/?cont=10&pageid=1&ma=B50PNCLP> (accessed 16 May 2017).

in both output and real value (Figure 1.8). Commercial fishing also grew steadily due to higher catches of tuna for export (David 2003). In terms of value, the fisheries output trend was positive due to higher prices.

Productivity Growth

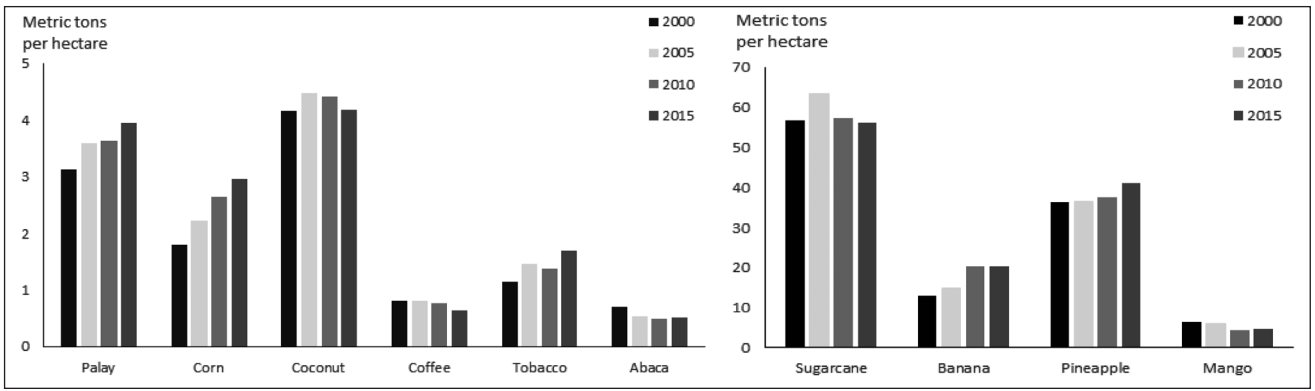
Productivity growth is key to the profitability and viability of any economic activity. In the long run, especially given land constraints and population pressures, the most-important driver of growth is improved production efficiency. Yields, defined as production output per unit of land, are a commonly used indicator of agricultural productivity (albeit partial because they only account for land as an input). On this basis, *palay* and corn productivity rose during the 2000s, whereas the productivity of the other crops stagnated (Figure 1.9). The productivity in sugarcane and pineapples changed little. Bananas recorded the most significant shift overall. Abaca, coffee, and mangoes all decreased in land productivity, whereas *palay*, corn, coconuts, and tobacco recorded significant increases during 2000–15.

A more comprehensive indicator of productivity growth, total factor productivity (TFP) takes into account the growth in all inputs used in production. Teruel and Dumagan (2014) estimated Philippine agricultural TFP growth using the "superlative index number" procedure, under which revenue growth is examined in the context of prices, quantities, and TFP. Considering estimates over the 1975–2004 period, agricultural TFP growth was highest during 1975–79, at 6.22 per cent (Table 1.10). Growth was mainly driven by the earlier Green Revolution but was not sustained thereafter and even plummeted into negative values during 1985–89. At the turn of the millennium, TFP growth began to rise, averaging 3.6 per cent during 2000–04.

FOOD AND CONSUMPTION PATTERNS

Food as a share of household consumption expenditures tends to decline with increased per capita incomes. This pattern has been found to be robust in both cross-sectional and time-series household data, and at local, regional, and global levels. In examining the driving forces behind this stylized pattern of development, Anderson (1986) identified the fundamental role of household preferences — that is, the universally increasing preference for nonfood relative to food purchases as per capita

FIGURE 1.9
Land Productivity, Selected Crops, 2000–15



Note: Data are presented as three-year averages centred on the year indicated
Source: Constructed by authors from the PSA (Philippine Statistics Authority), "Production", various years [j] <http://countrystat.psa.gov.ph/?cont=10&pageid=1&ma=B50PNCLP>; and "Land Use", various years [k] <http://countrystat.psa.gov.ph/?cont=10&pageid=1&ma=B50PNCLP> (accessed 16 May 2017).

TABLE 1.10
Total Factor Productivity and Contributions to Revenue Growth, 1975–2004

Parameter	*1975–79*	*1980–84*	*1985–89*	*1990–94*	*1995–99*	*2000–04*
TFP growth (%)	6.22	1.27	–0.70	1.70	2.20	3.58
Revenue growth (%)	9.37	19.15	10.87	8.96	8.86	7.04
Growth in output prices (%)						
Rice	0.36	3.75	2.14	1.71	1.42	0.83
Corn	0.10	1.51	1.09	0.44	0.28	0.63
Sugar	0.51	1.34	0.79	0.26	0.01	–0.01
Coconuts	0.27	3.24	–0.26	0.02	1.25	–0.14
Tobacco	0.15	0.17	0.04	0.07	0.05	0.06
Root crops	0.27	0.77	0.19	0.26	0.38	0.16
Fruit	–0.05	1.10	0.94	0.59	0.97	–0.03
Vegetables	0.06	0.34	0.09	0.08	0.08	–0.01
Meat	1.83	4.54	3.14	2.65	1.27	1.80
Eggs	0.32	0.78	0.23	0.20	0.13	0.18
Growth in input quantities (%)						
Seed	0.01	–0.01	0.01	0.00	0.04	0.01
Fertilizer	0.17	–0.29	0.68	0.12	0.22	0.07
Animal labour	0.01	0.36	–0.21	–0.12	0.28	0.15
Machinery	0.07	–0.04	–0.01	0.02	0.04	0.04
Land	–1.82	–0.32	2.19	0.34	0.10	0.03
Labour	0.90	0.64	0.54	0.62	0.13	–0.29

Note: TFP = total factor productivity.
Source: Teruel, Romeo, and Jesus Dumagan, "Total Factor Productivity Growth in Philippine Agriculture", in *Productivity Growth in Philippine Agriculture*, edited by R. Briones, M. Sombilla, and A. Balisacan (Los Baños: Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA); Muñoz, Nueva Ecija: Philippine Rice Research Institute (PhilRice); and Quezon City: Department of Agriculture-Bureau of Agricultural Research, 2014).

incomes rise. Nevertheless, substantial variation in household responses to income changes typically exists. Demand for staples (which in the Philippines and many countries of Asia and Africa means rice) tends to shift less in response to income changes than does the demand for commodities like meat and fruit, but at some point in the development process the share of food expenses does tend to fall (see Huang, Yang, and Rozelle 2010 for the case of China).

Interestingly, food consumption patterns in the Philippines appear not to conform to stylized patterns, at least based on recent data. At best, the evidence from cross-sectional and time-series data is mixed. Despite increases in per capita GDP since 2000 (averaging about 3 per cent per year), food as a share of household spending decreased only marginally between 2000 and 2015, ranging from 54 to 50 per cent (Table 1.11). This observation also extends to commodities comprising food expenditures. Spending on rice tended to rise rather than fall, and spending on meat, dairy, and fruit products unexpectedly declined or remained flat (Balisacan 1994). Cross-sectional data from the nationally representative 2015 Family Income and Expenditure Survey (PSA 2015), however, reflect the more expected trends (Figure 1.10).

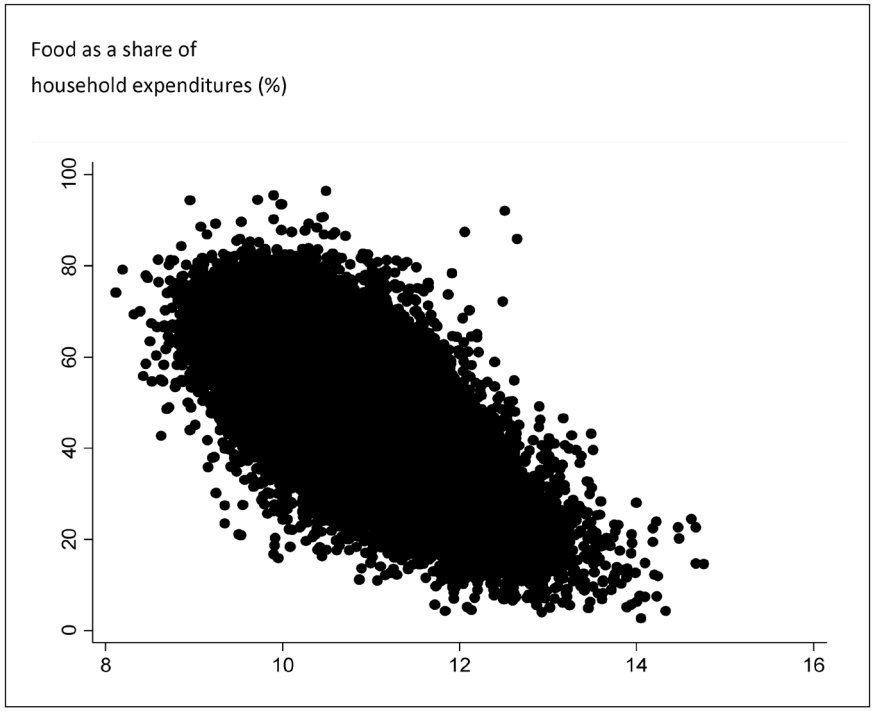
What could explain this conundrum? At least two, arguably fundamental, factors are involved. The first is that economic growth during the period was accompanied by rapidly rising income inequality, making growth highly exclusive. But because the consumption patterns of the very rich differ so much from those of the poor and near-poor — the overwhelming majority of the population — the average food consumption pattern of the entire population does not correlate with average income levels, as reflected by per capita GDP. The very sluggish reduction in absolute poverty in recent years could reflect initial high, and rising, income inequality. This, of course, is consistent with the earlier observation that food shares had decreased only marginally. Conceptually, this "Engel value" is a reasonable approximation of household welfare, with rising food shares indicating deterioration (Deaton 1986). The second factor in play has to do with the evolution of food prices relative to other consumer goods. In recent years, consumer food prices have tended to rise faster than nonfood prices (Figure 1.11). Movement in the Consumer Price Index (CPI) for the poorest 30 per cent of the population was even sharper (Figure 1.12) and the contrast for rice even sharper again. Since rice is such an important component in the diets of poor and near-poor people in the Philippines,

TABLE 1.11
Shares of Household Expenditures on Food, 2000–15

Category	*2000*	*2003*	*2006*	*2009*	*2012*	*2015*
Food as a share of total household expenditures (%)	54.0	52.4	51.1	52.23	52.8	50.6
Share of food consumed at home (%)	91.9	90.7	89.5	88.9	86.5	84.2
Share of food consumed outside home (%)	8.1	9.3	10.5	11.1	13.5	15.8
Share of food expenditures by food category (%)						
Cereals, excluding rice	9.7	9.5	8.5	8.1	8.8	8.9
Rice	24.2	22.1	23.7	25.7	24.6	23.6
Roots and tubers	1.7	1.5	1.3	1.3	2.0	1.9
Fruit and vegetables	9.9	9.9	9.2	8.9	9.1	8.8
Meat products	13.1	13.3	12.6	11.8	12.0	11.6
Dairy products	6.1	6.6	6.4	6.2	6.1	6.2
Fish products	13.9	13.8	13.2	12.8	13.3	12.5
Coffee, cocoa, and tea	2.4	2.5	2.7	2.6	3.3	3.7
Nonalcoholic beverages	2.6	2.8	2.7	2.8	2.7	2.7

Notes: For 2000, cereals include rice; for 2012 and 2015, roots and tubers are the sum of spending on vegetables cultivated for roots and potatoes and tubers. In 2012, a new product classification was used that might account for "kinks" in the trends.
Sources: Calculated by authors from PSA (Philippine Statistics Authority), "Family Income and Expenditure Survey. Incidence of multidimensional versus income-based poverty", various years [b] <http://web0.psa.gov.ph/content/family-income-and-expenditure-survey-fies> (accessed 16 May 2017).

FIGURE 1.10
Log of Per Capita Income Versus Food as a Share of Total Household Expenditures, 2015



Source: PSA (Philippine Statistics Authority), "Family Income and Expenditure Survey", 2015 <http://web0.psa.gov.ph/content/family-income-and-expenditure-survey-fies> (accessed 16 May 2017).

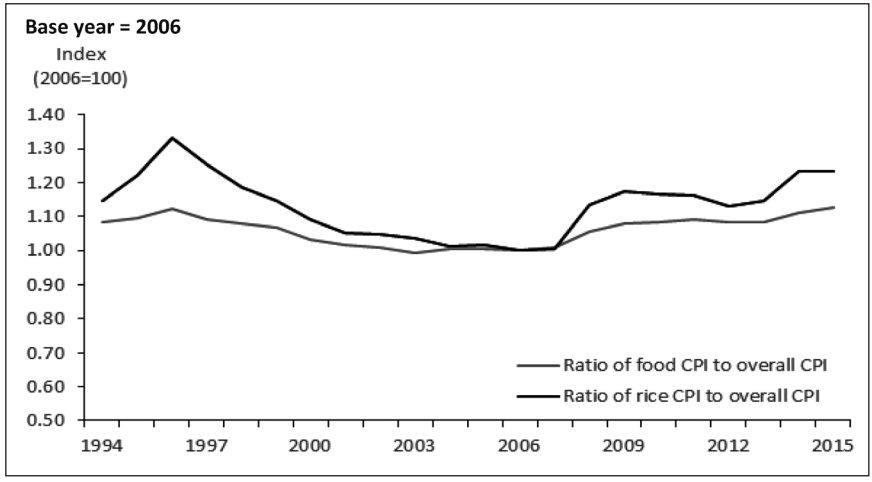
its share of household expenditures actually rises with rising prices. This effect, combined with the dismally low income increases among poor and near-poor households, explains for the sluggish decline in food shares.

AGRICULTURE AND POVERTY

Poverty Trends

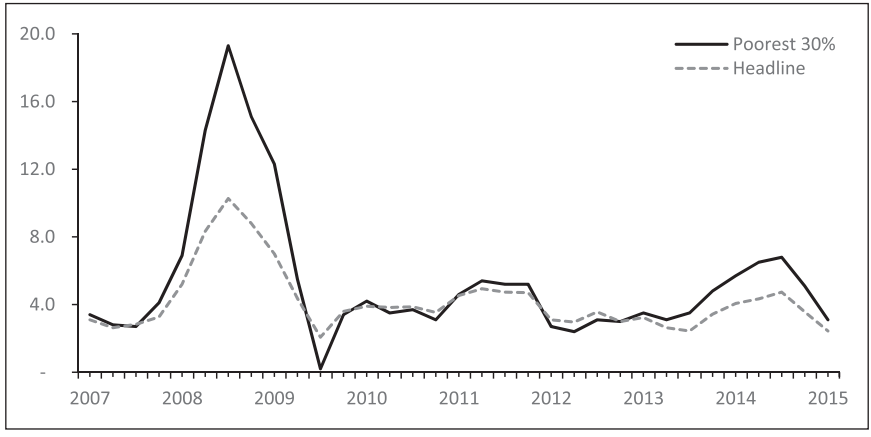
The rural sector constitutes half the national population (Table 1.12) and continues to account for about two-thirds of all poor people, the overwhelming majority of whom are employed in agriculture. Hence,

FIGURE 1.11
Consumer Price Index Ratios for Food, 1994–2015



Note: CPI = Consumer Price Index.
Source: Constructed by authors from PSA (Philippine Statistics Authority), "Family Income and Expenditure Survey", 2015 <http://web0.psa.gov.ph/content/family-income-and-expenditure-survey-fies> (accessed 16 May 2017).

FIGURE 1.12
Inflation Rate and Inflation Rate of the Poorest 30 per cent of Households, 2007–15



Source: Dennis Mapa, Kristelle Castillo, and Krizia Francisco, *Rice Price, Job Misery, Hunger Incidence: Need to Track Few More Statistical Indicators for the Poor* (Quezon City: School of Statistics, University of the Philippines, Diliman, 2015); and PSA (Philippine Statistics Authority), "Family Income and Expenditure Survey", 2015 <http://web0.psa.gov.ph/content/family-income-and-expenditure-survey-fies> (accessed 16 May 2017).

TABLE 1.12
Share of Urban, Rural, and Agricultural Population

	Total Population		*Agricultural Population*	
Year	*Urban*	*Rural*	*Urban*	*Rural*
2003	49.1	50.9	13.2	86.8
2006	49.3	50.7	13.6	86.3
2009	49.4	50.6	13.9	86.2
2012	43.9	56.1	13.6	86.4
2015	42.9	57.1	14.2	85.8

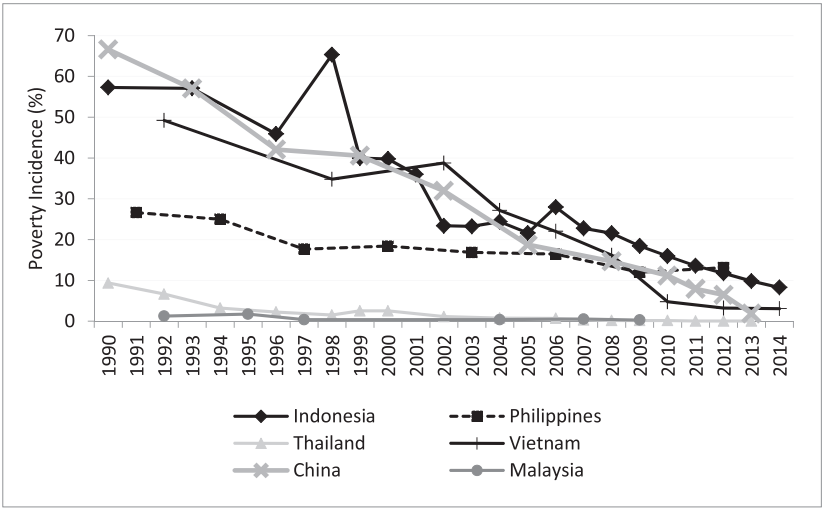
Source: Calculated by authors from PSA (Philippine Statistics Authority), "Family Income and Expenditure Survey. Incidence of multidimensional versus income-based poverty", various years [b] <http://web0.psa.gov.ph/content/family-income-and-expenditure-survey-fies> (accessed 16 May 2017).

despite rapid urbanization in recent years, poverty in the Philippines — as in many other developing countries — is a largely rural phenomenon.

In the early 1990s, absolute poverty in the Philippines was much less prevalent than in China, Indonesia, or Vietnam. But the country made virtually no progress in reducing poverty in subsequent years, particularly in the first decade of the new millennium (Figure 1.13). Farmers in the major emerging ASEAN member countries of Indonesia, Thailand, and Vietnam benefited enormously from the modernization of both local and global supply chains and trade opportunities arising from the rapid expansion of Asian agri-food markets. Together with sustained growth of employment opportunities in nonfarm sectors of the economy, particularly industry, this development facilitated rapid poverty reduction, particularly in rural areas. Based on the World Bank's poverty line of US$1.90 a day, the proportion of the population in the "absolute poor" category declined rapidly in China, Indonesia, and Vietnam between 1990 and 2014 (Figure 1.13). The same rapid decline occurred in Malaysia and Thailand in the 1970s and 1980s.

The poverty trend in the Philippines is another story: the incidence of poverty both regionally and nationally has changed little since the turn of the new millennium (Table 1.13). During 2000–12, Philippine poverty levels were unresponsive to rapid income growth and other opportunities occurring in East and Southeast Asia. The country's economic growth was considerable in the 2000s (4.7 per cent per year on average), but not as high as in neighbouring countries. Nonetheless, the incidence of poverty seems to be going down by 2015 (Table 1.13).

FIGURE 1.13
Poverty Reduction, Select Asian Countries, 1990–2014



Notes: Estimates refer to the share of population living on less than US$1.90 a day (based on 2011 purchasing power parity exchange rates). Data for Indonesia are approximations based on urban and rural estimates.
Sources: Constructed by authors from World Bank, PovcalNet, various years <http://iresearch.worldbank.org/PovcalNet/> (accessed 20 May 2015).

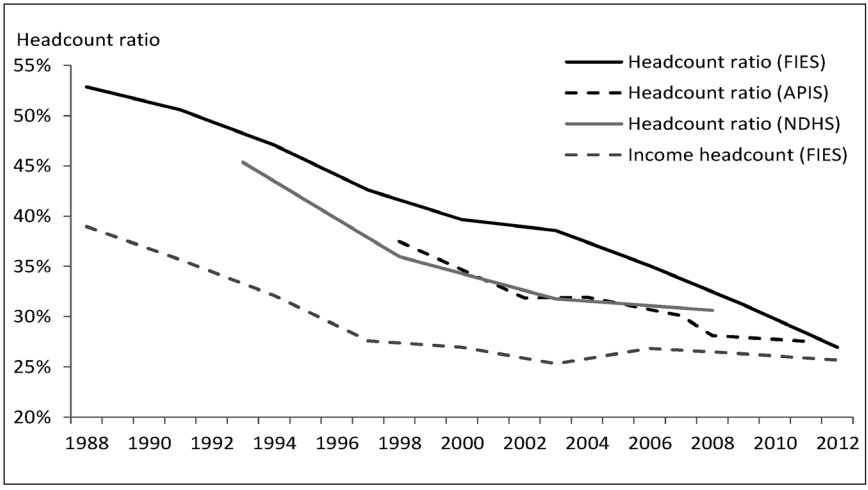
It is puzzling as to why growth failed to translate into lower absolute poverty levels, but recent research has investigated the issue (Balisacan 2007, 2015; Fuwa, Balisacan, and Bresciani 2015). Beyond income levels, the poverty reduction trend improved in other areas of human deprivation. Balisacan (2015) estimated trends in the incidence of multidimensional poverty and income-based poverty (Figure 1.14). All three data sources used — the Annual Poverty Indicators Survey, Family Income and Expenditure Survey, and National Demographic and Health Survey (PSA various years [a, b, and e]) — indicate continuing reductions in the incidence of multidimensional poverty at yearly rates of 1.78, 2.04, and 2.17 per cent, respectively. All three sources also confirmed deceleration in poverty reduction in the 2000s. The pattern of poverty is quite different seen through the lens of official income-based poverty data. Trends in those data show that GDP growth from 1997 had no significant impact on poverty. The difference is apparent for estimates of multidimensional

TABLE 1.13
Poverty Incidence by Region, 1991, 2006, 2009, 2012, and 2015

	1991	*2006*	*2009*	*2012*	*2015*
Region	*Share of Population (%)*				
Autonomous Region in Muslim Mindanao (ARMM)	30.5	47.1	47.4	55.8	53.7
Cordillera Administrative Region (CAR)	42.7	26.0	25.1	22.8	19.7
Caraga	54.3	49.2	54.4	40.3	39.1
National Capital Region	7.1	4.7	3.6	3.9	3.9
Region 1 (Ilocos Region)	36.6	25.9	22.0	18.5	13.1
Region 2 (Cagayan Valley)	42.8	26.8	25.5	22.1	15.8
Region 3 (Central Luzon)	21.1	13.1	13.7	12.9	11.2
Region 4a (CALABARZON)	22.7	10.3	11.9	10.9	9.1
Region 4b (MIMAROPA)	44.4	40.6	34.5	31.0	24.4
Region 5 (Bicol Region)	54.5	44.2	44.2	41.1	36.0
Region 6 (Western Visayas)	39.6	29.1	30.8	29.1	22.4
Region 7 (Central Visayas)	43.6	35.9	31.0	30.2	27.6
Region 8 (Eastern Visayas)	50.0	41.5	42.6	45.2	38.7
Region 9 (Zamboanga Peninsula)	40.3	45.0	45.8	40.1	33.9
Region 10 (Northern Mindanao)	46.6	39.0	40.1	39.5	36.6
Region 11 (Davao Region)	39.6	30.6	31.4	30.7	22.0
Region 12 (SOCCSKSARGEN)	53.3	37.9	38.3	44.7	37.3
National total	34.4	26.6	26.3	25.2	21.6

Note: Caraga comprises four provinces: Agusan del Norte, Agusan del Sur, Surigao del Norte, and Surigao del Sur; CALABARZON comprises five provinces: Cavite, Laguna, Batangas, Rizal, and Quezon; MIMAROPA comprises five provinces: Mindoro Oriental, Mindoro Occidental, Marinduque, Romblon, and Palawan; and SOCCSKSARGEN comprises four provinces and one city: South Cotabato, Cotabato, Sultan Kudarat, Sarangi, and General Santos City. Based on a major revision, PSA's estimation methodology was different in 1991 than in the other years; nevertheless, the national estimate of the incidence of poverty for that year is still used as the basis of the country's poverty reduction target under the Millennium Development Goals.
Source: Compiled by authors from PSA (Philippine Statistics Authority), "Poverty Incidence by Region", various years [g] <www.nscb.gov.ph/poverty/dataCharts.asp> (accessed 16 May 2017).

FIGURE 1.14
Incidence of Multidimensional Versus Income-Based Poverty, 1988–2012



Notes: APIS = Annual Poverty Indicators Survey; FIES = Family Income and Expenditure Survey; NDHS = National Demographic and Health Survey. FIES data from 2000 onward are not strictly comparable with data prior to 2000 due to changes in the survey questionnaire over time. The APIS, FIES, and NDHS trends are based on multidimensional measures of poverty (including, for example, health, education, and standard living), whereas the income-based poverty trend is based on the official 2009 per capita food poverty threshold.
Source: Arsenio Balisacan, "The Growth-Poverty Nexus: Multidimensional Poverty in the Philippines", in *Sustainable Economic Development: Resources, Environment and Institutions*, edited by A. Balisacan, U. Chakravorty, and M. Ravago (Oxford and San Diego: Elsevier Academic Press, 2015).

poverty using the Annual Poverty Indicators Survey and Family Income and Expenditure Survey, which both show continued improvements in poverty reduction during the 2000s.

Agricultural Growth as an Engine of Local Poverty Reduction

Some of the literature points to key policy and institutional issues as an explanation for why the country has failed to seize growth and poverty reduction opportunities. This section reviews empirical evidence of the connection between agricultural growth and rural welfare outcomes, especially those associated with generating employment, reducing poverty, and supporting other aspects of human development. This discussion

also draws from the literature to identify the role of urbanization, infrastructure development, asset/income inequality, and local geophysical characteristics in shaping the comparative advantage of agricultural growth in driving local poverty reduction.

Around the world, particularly in East Asia, agriculture's relative importance to national income levels, employment, and poverty reduction has rapidly declined. In the fast-emerging economies of Asia, invariably, this structural transformation has been accompanied by substantial poverty reduction. China's experience in the 1980s and 1990s (and even today) illustrates the poverty-reducing effects of structural transformation. The agricultural sector declined sharply in relative importance, and national poverty levels also fell rapidly, especially in agricultural and rural areas. As a result, about 600 million people were lifted out of poverty in the past three decades. China was the single largest contributor to the global poverty reduction achieved in 1980–2010. Behind this success was the dynamic interplay of rapid agricultural production growth fuelled by productivity improvements, especially in the food sector, and even more rapid nonagricultural income growth, mainly induced by massive off-farm investments in industry and labour-intensive exports. This tremendously transformed household income sources even among farm households. In the early 1980s, about 80 per cent of the incomes of Chinese farm households were derived from agriculture, whereas by the late 2000s, this share had dropped to only about 40 per cent. The same development pattern, albeit at a slower rate, was apparent in Indonesia, Thailand, and Vietnam.

Poverty reduction has varied remarkably across Philippine provinces and regions. Part of the variation has to do with the pace of local income growth, broadly suggesting that income growth is a necessary prerequisite for poverty reduction (as is evident in national and global contexts). But the source of growth is important for local poverty reduction. For the country's seventy-three provinces, poverty reduction tended to follow expected trends whenever nonagricultural income grew faster than agricultural income (Appendix Table 1.1). This was true not only in urban areas, but also in rural areas. This does not, however, suggest that agricultural growth is inconsequential to local poverty reduction at this stage of the country's development. On the contrary, under certain conditions, agriculture does matter and will continue to matter. A number of provinces achieved poverty reduction under a regime where agricultural income grew faster than nonagricultural income. The response of poverty to sectoral growth,

whether agricultural or nonagricultural, depends on a number of factors that could vary by location.

An in-depth examination of the factors influencing the response of poverty reduction to income growth reveals that the factors operating for the agricultural sector are quite different from those operating for the nonagricultural sector (Appendix Table 1.2). When it comes to agricultural growth, elasticity (that is, sensitivity to change) tends to be higher in areas where the potential for agricultural productivity is high, based on geophysical endowments, and urbanization is relatively low. Put another way, agricultural development has high potential to drive poverty reduction in areas with high potential for agricultural productivity growth (for example, through irrigation development in relatively flat landscapes), as well as in relatively more rural or remote (that is, less commercialized) areas. In Ilocos provinces, for example, agriculture is still likely to be a key driver of poverty reduction given its comparatively low asset inequality and distance from industrializing or urbanizing centers. This would be even more pronounced with improved access to the national road network, thereby linking the provinces to major markets for farm produce, including exports.

For the nonagricultural sector, the response tends to be influenced by initial levels of income/asset inequality, human capital, and infrastructure development. High land inequality, such as in the Negros provinces, weakens the capacity of nonfarm income growth to serve as a key driver of poverty reduction. High levels of human capital favour nonfarm development, which also favours faster poverty reduction. Rapidly developing areas tend to have good infrastructure, which reduces transaction costs and facilitates the agglomeration (that is, urbanization) of economies. The type of infrastructure development influences poverty's response to income growth. In another recent study of the impact of infrastructure on agricultural versus nonagricultural income growth, Fuwa, Balisacan, and Bresciani (2015) found that investing in local roads is likely to facilitate rural nonfarm growth, whereas investing in national roads is likely to reinforce agricultural growth by providing greater access to agricultural markets. Thus, investing in national road networks does not appear likely to lead to rural industrialization, but rather to further urbanization, whereas investing in local road networks could facilitate rural nonfarm sector development (and may well mitigate urban congestion).

KEY POLICY AND GOVERNANCE ISSUES

This section examines key constraints to growth and poverty reduction preventing the Philippines from achieving inclusive development and sharing in the prosperity its neighbours are already experiencing. In particular, the discussion addresses how policy reform and public investment can alter the course of agricultural and rural development to fuel poverty reduction while the economy maintains its high-growth trajectory.

Macroeconomic Constraints

A fundamental development lesson in the past half-century is the overwhelming influence of macroeconomic factors, such as monetary, fiscal, and exchange rate policies, on overall economic incentives for agriculture and rural areas. In many developing countries, these policies have tended to be biased in favour of industry (and services) and against agriculture, thereby prematurely drawing resources away from agriculture to the nonagricultural sector of the economy. Specifically, unsustainably high fiscal deficits and high inflation rates accompanying attempts to spur growth, combined with exchange rate controls and protectionist policies for import-substituting industries, have prompted overvaluation of the local currency, disproportionately hurting the highly tradable agricultural sector, particularly in terms of export commodities. Moreover, the indirect effects of these policies on agricultural incentives have overwhelmingly tended to offset any favourable effects of direct policies and programmes targeting agriculture — such as input subsidies and output price support, among others (Krueger, Schiff, and Valdes 1991; Anderson et al. 2008). The policy-induced suppression of agricultural incentives has meant lower income growth in agriculture, less dynamic economic transformation, and less poverty reduction despite economic opportunities arising from rapid growth in global trade, information and communications technologies, and global food and agricultural value chains (Reardon and Timmer 2007; World Bank 2008; Reardon, Timmer, and Minten 2012).

While the same pattern of incentives generally prevailed in the Philippines (David, Intal, and Balisacan 2009), the macroeconomic environment was benign for agriculture (and for the economy as a whole) during 2005–14. Unlike previous episodes of growth in most of the postwar period, when every boom was soon followed by a bust, growth

since the recovery from the global financial crisis has been supported by sound macroeconomic fundamentals: declining debt burden, declining public-sector deficits, low inflation rates (within government targets), consistently strong current-account positions, and improving public-sector revenues. Outstanding public-sector debt as share of GDP declined from about 101 per cent in 2000–02 to about 72 per cent in 2011–13. Interest payments as a share of GDP declined from about 30 per cent in 2006 to 17 per cent in 2013. The national government borrowing programme increasingly shifted away from foreign to domestic sources (with the share of foreign borrowing fell from 44 per cent in 2009 to 11 per cent in 2013), thereby reducing the country's exposure to external shocks. Although government revenues, expressed as a share of GDP, have yet to rebound from the low levels recorded in 2006–08, they have gradually improved in recent years, rising from about 13 per cent in 2010 to about 15 per cent in 2013 and 2014. Together with more effective spending management, these developments have precipitated lower fiscal deficits — down from about 3.5 per cent of GDP in 2009 and 2010 to 1 per cent in 2013 and 2014. Meanwhile, inflation has remained low and within the target range of 2–5 per cent since 2009. The current account has likewise been consistently positive since the mid-2000s on the back of robust overseas worker remittances, business process outsourcing, tourism receipts, and merchandise exports. This favourable external position has allowed the country to somehow withstand external shocks, such as recessions in major trading partners and the global financial crisis, and hence prevent sharp swings in the exchange rate and domestic interest rates (which characterized other decades after World War II).

The challenge, moving forward, is to sustain the momentum of fiscal reform. Expanding the tax base and developing new revenue sources to further raise levels at least to those of the country's neighbors will be crucial in fiscally fortifying the economy and sustaining rapid growth. Massive infrastructure development in transport, power, information and communications, irrigation and drainage, and disaster risk reduction will be crucial to building a highly competitive and resilient economy, especially in view of the onset of economic cooperation among ASEAN countries and increasing integration of the Philippine economy in global markets. Additionally, strong investment in the social sector in recent years — particularly in health, education, and social protection — has to be sustained in order to foster human development and shared prosperity. Improving

access to finance for small and medium-sized enterprises, especially in rural areas, are also necessary to ensure more inclusive growth.

Modernization of the Sector

The Agriculture and Fisheries Modernization Act (Republic Act 8435) of 1997 is the overarching legislation providing for the policies and measures intended to modernize and enhance the profitability of the sector, thereby preparing it for the challenges of globalization. To this end, the Act prescribes the formulation and implementation of a medium-to-long term, comprehensive Agricultural and Fisheries Modernization Plan (AFMP). The Plan is envisioned to encompass programmes and strategies covering infrastructure and market support, credit, research and development, biodiversity and environment, agrarian reform, extension services, among others.

AFMP was initially to be implemented from 1998 to 2003, with a first year budget of PhP20 billion, and a yearly budget thereafter of PhP17 billion (representing a total budget of PhP105 billion over and above the Department of Agriculture's regular budget). In actuality, only 71 per cent of AFMP's allocated budget was released during these first six years, representing a total of PhP80.9 billion over and above the Department of Agriculture's budget (Table 1.14). This increased the Department of Agriculture's budget from PhP15.7 billion in 1998 to PhP22.9 billion in 2015 (Table 1.15). Overall, budget levels fluctuated significantly, dropping to PhP9.1 billion in 2005 and peaking at PhP33.6 billion in 2014 (Table 1.15).

As indicated, disbursement levels have been lower than budgeted allocations and the release of funding has also been delayed (Habito and Briones 2005; Dy 2005; SEPO 2009). AFMP's first year's budget was released three years after the law was enacted (Table 1.15) which hindered the prompt and efficient delivery of programmed activities. Another problem is the fact that not all the Department of Agriculture's programmed activities were allocated a fair share of the budget increases (Appendix Table 1.3). Budget cuts primarily affected the productivity-enhancing components, both of AFMP specifically, and the Department of Agriculture's programming more generally. A clear example is the actual R&D allocation, which for the first six years averaged only 4.3 per cent of AFMP's yearly budget. By way of comparison, this is 5.7 per cent lower than the 10 per cent share mandated by the Agriculture and

TABLE 1.14
Actual Versus Mandated Agriculture and Fisheries Modernization Programme Budget, 2000–05

Year	*Mandated Budget Allocation (billion PhP)*	*Actual AFMP Budget (billion PhP)*	*Actual Budget as a Share of Mandated Budget (%)*
2000	17.9	14.9	83.2
2001	14.1	9.5	67.4
2002	13.5	11.4	84.9
2003	12.8	9.2	71.4
2004	11.8	6.5	55.1
2005	10.6	6.4	60.4
Total/average	80.9	58.0	71.7

Notes: AFMP = Agriculture and Fisheries Modernization Program. Financial data are presented in real Philippine pesos, deflated by the wholesale price index (WPI) with a base year of 1998.
Source: Constructed by authors from Albert Aquino, Anita Tidon, Princess Ani, and Meliza Festejo. "The Agriculture and Fisheries Modernization Act of 1997: A Collective Approach to Competitiveness", 2013 <http://ap.fftc.agnet.org/ap_db.php?id=77> (accessed 25 May 2016).

Fisheries Modernization Act (Dy 2005; Aragon et al. 2011). Moreover, the share of the total agricultural budget allocated to R&D fell to an average of less than 3 per cent per year during 2006–14 (Appendix Table 1.3). The share returned to 5.5 per cent of the total agricultural budget in 2015. The budget allocation for extension was similarly low, affecting the quality and frequency of extension activities, although it was increased to 7.5 per cent in 2015, compared with an average of 4.8 per cent per year during 2006–14.

AFMA's National Banner Programmes

Rice has continued to receive the largest share of Department of Agriculture's budget (Table 1.16). It has also received sizeable shares of the budget allocated for public support services, including irrigation and postharvest facilities. A major reason for the huge support to rice relates to the country's goal of achieving rice self-sufficiency, and the fact that most of poor, smallholder farmers engage in rice cultivation. The government's focus on rice dwarfed its support for other commodities, ultimately hindering production diversification. Rice has continued to account for about one-third of the total agricultural area planted in the past five and a

TABLE 1.15
Department of Agriculture Budget, 1998–2015

Year	*Regular Budget for Agriculture*	*Regular Budget for Agriculture Plus Additional GATT Allocation*	*Regular Budget for Agriculture Plus Additional AFMP Allocation*	*Total*
	(thousand PhP)			
1998	2,838,727	12,892,205		15,730,932
1999	3,172,950	11,017,299		14,190,249
2000	3,735,267		14,919,666	18,654,934
2001	3,874,047		9,525,573	13,399,620
2002	4,436,651		11,442,170	15,878,820
2003	3,356,965		9,160,890	12,517,855
2004	2,961,065		6,519,188	9,480,253
2005	2,672,742		6,417,178	9,089,921
2006	2,512,281		6,616,186	9,128,467
2007	2,783,440		7,941,093	10,724,534
2008	3,084,964		10,809,607	13,894,571
2009	4,830,741		19,627,383	24,458,124
2010			24,107,452	24,107,452
2011			17,258,176	17,258,176
2012			27,296,198	27,296,198
2013			32,742,946	32,742,946
2014			33,639,080	33,639,080
2015			22,896,742	22,896,742

Notes: GATT = General Agreement on Tariffs and Trade; AFMP = Agriculture and Fisheries Modernization Program. Financial data are presented in real Philippine pesos, deflated by the wholesale price index (WPI) with a base year of 1998. From 1995 to 1999 the regular Department of Agriculture budget was enhanced to ensure that GATT commitments were met. With the implementation of AFMP, the GATT budget was cut. As of 2010, the General Appropriations Act consolidated the Department of Agriculture budget, so from that year AFMP allocations are not specified.
Sources: Constructed by authors from DBM (Department of Budget and Management), Philippines General Appropriations Act, Various years, retrieved from <http://www.dbm.gov.ph/index.php/dbm-publications/general-appropriations-act-gaa>.

half decades, while the combined share of other traditional crops, such as corn, coconuts, and sugarcane, has been close to 50 per cent. High-value crops, such as fruit and vegetables, have only accounted for a meagre 3 to 4 per cent of total area harvested. This pattern has persisted over time — despite the relatively high returns of high-value crops, including those with great export potential — and clearly runs counter to what would be

TABLE 1.16
Allocation of the Department of Agriculture Budget for Commodity Programmes and Other Supporting Activities, 2010–15

Programme	*2010*	*2011*	*2012*	*2013*	*2014*	*2015*
	(million PhP)					
NIA irrigation projects	6,702	5,801	10,966	11,845	9,073	n.d.
Farm-to-market roads	3,231	1,134	2,243	3,115	5,157	2,794
National rice program	1,741	1,958	2,772	3,291	2,965	3,131
National corn program	472	220	426	673	772	1,027
National high-value crop program	1,012	420	600	599	719	983
National livestock program	382	309	461	454	580	722
National fisheries program	1,337	813	1,077	1,614	1,797	2,042
Organic agriculture	246	408	416	409	377	284
Quick response fund	n.d.	n.d.	224	442	215	224
Credit facility to agrarian reform beneficiaries	n.d.	n.d.	n.d.	44	n.d.	n.d.
Market development	246	306	409	391	100	97
Other support programs	3,762	2,883	2,565	3,293	3,476	4,033
Locally funded projects	782	1,320	651	1,274	4,196	3,323
Foreign-assisted projects	377	391	1,074	887	705	3,390
Total appropriations	20,291	15,963	23,882	28,728	30,131	22,049

Notes: NIA = National Irrigation Authority; n.d. = no data. Financial data are presented in real Philippine pesos, deflated by the wholesale price index (WPI) with a base year of 1998. Other support programmes include budgets for general management and supervision; support to operations and operations of the office of the secretary and attached agencies; and automatic appropriations, such as retirement and life insurance premiums, the Japanese increased food production programme, the agricultural competitiveness enhancement fund, and the special account in the general fund. Data for total appropriations exclude the quick response fund and credit facility to agrarian reform beneficiaries in 2010 and 2011; the credit facility to agrarian reform beneficiaries in 2012 and 2014; and the NIA irrigation projects and credit facility to agrarian reform beneficiaries in 2015.

Sources: Constructed by authors from DBM (Department of Budget and Management), Philippines General Appropriations Act, various years, retrieved from <http://www.dbm.gov.ph/index.php/dbm-publications/general-appropriations-act-gaa>.

expected under competitive markets, where land use should shift from low- to high-return crops (World Bank 2007).

In short, the banner programmes do not appear to have contributed to the goal of agricultural development, nor have they improved the competitive position of the commodities that have received huge government support. The yield levels of these commodities — a partial indicator of productivity performance — have not been outstanding as discussed earlier in this chapter. Importantly, the commodity-based focus of government programmes, as opposed to a whole farm system, failed to give farmers the opportunity to earn additional income. Because of meagre government support, high-value commodities with huge export and value-adding potentials — such as coffee, cacao, some fruits, and vegetables — were not fully developed to compete on the global market. The government's budget allocation also failed to provide strong support for greater farm diversification to crops that are more resilient to natural shocks, such as increasingly severe weather aberrations resulting from climate change.

Another observation relates to subsidies on farm inputs, such as seed and other planting material, fingerlings, fertilizer, animals, and postharvest facilities, which are essentially private goods and services. Balisacan, Sebastian, and associates (2006) find that these subsidies distort farmers' technology choices, encourage the misallocation of resources, crowd out the private sector, and even disproportionately benefit farmers who are already better off. Although these subsidies have been reduced in recent years, they remain a problem.

Irrigation Development Programme

Efficient irrigation systems increase agricultural productivity and income by providing farmers with at least one additional crop per year. The importance of these structures is indicated through their share of agriculture's budget. Irrigation development was the recipient of an average share of 30 per cent per year during 2000–15, second only to production support.[2] Despite the considerable resources invested in the construction of new irrigation systems and the rehabilitation of existing ones, between 2000 and 2014 the "firmed-up" service area[3] only increased by 346,609 ha or 23,107 ha per year. More worrisome are problems related to the quality of operations and maintenance (O&M) especially within national irrigation systems,

which have affected their service performance as discussed in more detail in Chapter 3, in this volume.

The Research Development and Extension Programme

The country's underinvestment in R&D and its weak extension capacity were examined by Francisco and Bordey (2014), who provide various indicators, such as the number of agricultural researchers and extension personnel per million population; the ratio of gross expenditure on R&D and extension to gross national product and agricultural value-added; and per capita research investment, all of which were shown to be below the comparable levels of other Asian countries. Underinvestment in agricultural R&D and extension in more recent years persisted, as noted earlier, with its low share of the Department of Agriculture's budget. The issue goes beyond budget levels, however. The clear disconnect between public research and public needs has become more disturbing. The government research and extension programmes in response to farmers' problems are ad hoc.[4] No regular activities assess farmers' productivity problems for the purpose of setting research and extension (Ponce and Dy 2014). More often than not, scientists undertake R&D activities based on their specializations and expertise rather than in response to farmers' or the sector's needs.

As previously noted, the dominant focus of public R&D on rice discriminates against other commodities in terms of access to improved technologies to enhance quality and yields. But even rice research which is deemed to be the most organized stream of public R&D in the Philippines and which boosts its high-yielding seed varieties that is resistant to a variety of adverse environments and weather conditions has been partially successful in achieving the yield levels that are to be expected of modern varieties due to their poor adoption. Majority of farmers still use their own saved seed (from recent harvests) rather than certified seed. Sombilla and Quilloy (2014) identified a number of reasons for this, including both logistical, which includes the weak extension service, and technical difficulties.

Government Credit and Crop Insurance Programmes

The credit policy reforms that took place under the AFMP phased out all the government's direct credit programmes in the agricultural sector and

established a market-based credit policy, among others. These reforms led to more active participation by private financial institutions in rural credit markets; the emergence of innovative micro-lending techniques; and, hence, greater access by smallholder farmers to formal financial institutions. Nevertheless, such progress is still insufficient considering that a very large number of smallholder borrowers still depend on informal lenders for production financing. The participation of formal financial services and commercial banks continues to be low due to ongoing fear of high and systemic risks, and the huge transaction costs involved compared with the low and unstable profitability of the agricultural sector (Llanto 2006). Investment credit that covers long-gestation crops, such as rubber and oil palm, is still greatly lacking. To deal with these lingering issues, policymakers need to strengthen the credibility of the regulatory system that governs the financial market, establish an efficient credit information bureau, and improve the efficiency of risk-reducing instruments like agricultural insurance that could improve the credit worthiness of smallholder farmers.

The country's agricultural insurance programme, implemented by the Philippine Crop Insurance Corporation, has to date not lived up to its main objective of managing agricultural risks. Despite the subsidies extended by the programme and the growth in the product lines it offers, penetration among farmers is still low, and its need to yield higher returns to the insurer continues to threaten its sustainability. Reyes et al. (2015) provide a comprehensive assessment of the programme, identifying contributing factors to the low penetration — estimated to be less than 10 per cent during 1981–2014 for rice and corn, and much lower for high-value crops. A key factor is the level of insurance coverage, which is lower than farmers' actual production costs, whereas the premium rate is deemed to be unreasonably high. Implementation is also problematic in terms of the need for more careful assessment of damages, streamlining procedures for processing claims, and ensuring the proper selection of targeted beneficiaries. The challenge of sustaining higher returns to insurers relates to the risky nature of agricultural production to natural disasters, such as typhoons, that affect large number of farmers at the same time. When such disasters occur, premiums are insufficient to cover the cost of indemnity. Weather index-based insurance designed to overcome some of these problems especially those related to climate change and increasing weather variability, should be explored by the government through private-sector pilot projects.

Overall Performance of the Agricultural Programmes

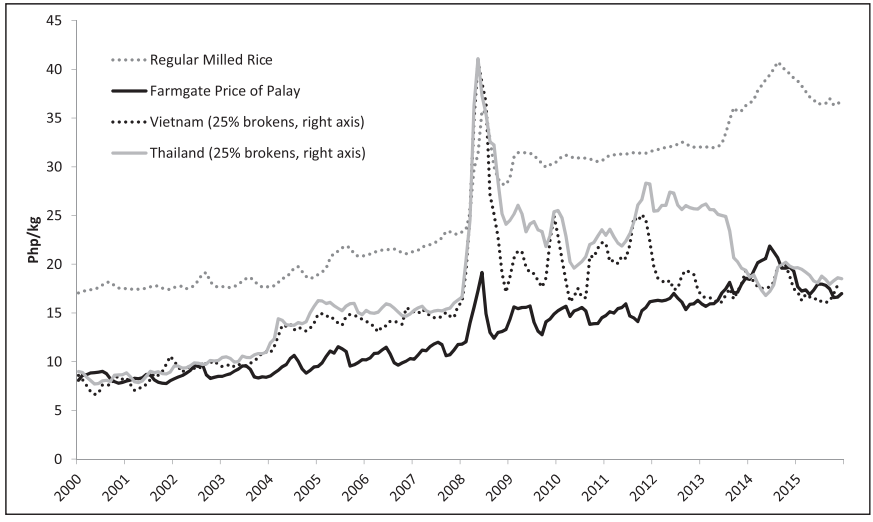
The implementation issues and controversies that riddled the programmes affected the momentum and ultimately the effectiveness of the Department of Agriculture's programmes. The continued bias against agriculture as evidenced by the country's public investment in the sector has also contributed to the failure of these programmes to make the needed dent in improving the welfare of the Filipino farmers (Ravago and Balisacan 2016).

Food Sufficiency Policy

The country's food policy, as indicated in various Philippine Development Plans, has multiple objectives: achieving food security, increasing smallholder incomes, protecting poor consumers from high prices, and raising productivity to enhance farming's contribution to economic growth and development. In practice, the policy largely focuses on rice and involves buying *palay* from producers at above-market prices and selling rice to consumers at below-market prices, especially in urban areas. The other goal of the policy is to achieve national self-sufficiency in its primary staple food, which is implemented by the National Food Authority (NFA), under the Department of Agriculture.[5] NFA is empowered to monopolize the importation of rice and to implement quantitative restrictions on rice imports when the private sector is permitted to import. NFA also regulates domestic rice trade and is provided a subsidy by the national government for its operations. The national self-sufficiency goal puts pressure on NFA to restrict the volume of imports, driving domestic rice prices above comparable border prices. NFA uses this higher level of domestic prices as the basis for its "sell low" prices for consumers.

The policy regime — NFA's near monopoly on rice trade, high import tariffs, and quantitative restrictions on rice — has resulted in inadequate supply and has artificially kept domestic prices 50 to 100 per cent higher than comparable global (border) prices (World Bank 2015*a*). As a result, Filipinos pay more for their staples than their counterparts in Southeast Asian countries; moreover, they have not benefited from falling world rice prices in recent years (Figure 1.15). Even most rice farmers have not benefited from NFA's support price, partly due to poor targeting and partly because NFA's procurement represents only a small component of total rice production (typically less than 5 per cent).

FIGURE 1.15
Trends of Rice Prices in Domestic and World Markets, 2000–15



Notes: *Palay* is unmilled rice; 25 per cent broken rice is a standard grade of milled rice. The spike in 2008 is due to global food crisis. World prices were converted from U.S. dollars per ton using monthly exchange rates from the Banko Sentral ng Pilipinas.
Sources: Constructed by authors from FAO (Food and Agriculture Organization of the United Nations), FAOSTAT database, various years <http://faostat3.fao.org/home/E> (accessed 17 May 2015); domestic retail and farmgate *palay* prices are from PSA (Philippine Statistics Authority), "Prices", various years [l] <http://countrystat.psa.gov.ph/> (accessed 16 May 2017).

The high rice prices have effectively reduced the purchasing power of the incomes of Filipinos, particularly poor people whose rice expenditure accounts for about 20 per cent of their total household expenditures. This means that, in order to meet their staple needs, poor people have to cut down on other expenditures, such as education and health care — or, even worse, their intake of rice, which could cause malnutrition. In recent years, the incidence of malnutrition in the Philippines has been among the highest of countries with comparable development levels (World Bank 2015*b*). Despite its comparatively remarkable economic growth in recent years, the Philippines is also one of the very few Asian countries that failed to achieve the Millennium Development Goals' 2015 poverty target.

The ramifications of high food prices on poverty are especially notable in 2013 and 2014, largely because NFA chose to restrict imports tightly,

despite dwindling rice inventory. As a result, domestic rice prices rose sharply to a high of 15 per cent in the second half of 2013. From the first half of 2013 to the first half of 2014, the inflation rate for items comprising the food basket of poor people (which is used to estimate the incidence of poverty) increased by 9.4 per cent (see Figure 1.12 presented earlier). In contrast, the overall inflation rate for the period was only 4.3 per cent. Based on the results of the 2012 Family Income and Expenditure Survey, the average nominal per capita income of the poorest 30 per cent of the population increased by 7.2 per cent, whereas levels for the richest 20 per cent increased by 4.5 per cent. In the absence of highly inflated food prices (or were the inflation rate for food items only as high as the overall inflation rate), the real incomes of poor people could have risen, and the increase could have been more *proportionally* than the increase for the richest 20 per cent of the population. Simply put, growth could have been pro-poor and inclusive, but, instead, the poorest 30 per cent of the population experienced declines in their real incomes, not increases. So despite quite remarkable GDP growth of 7.2 per cent in 2013 and 6.1 per cent in 2014 (even by the standards of the emerging economies of the world), the incidence of poverty in the Philippines actually rose from 24.6 per cent in the first half of 2013 to 25.8 per cent in the first half of 2014 based on PSA's official calculations.

Hence, neither objective of the policy — self-sufficiency nor poverty reduction — was achieved. "Selling low" to poor people also had little effect on their welfare because NFA rice only accounts for about 11 per cent of their rice purchases (and leakage of the subsidy to the nonpoor is high). Similarly, the policy of buying high from farmers would also have had little impact because NFA's total purchases, at an average of only 7 per cent of total production, are too small (and leakage of the subsidy to large farmers and perhaps traders is also high). In any case, the policy has proven to be a costly way both of providing income transfers to poor people and of securing the availability of rice nationally. For every peso reaching poor people, 2 pesos were spent (Roumasset 2000). Additionally, for every US$1.00 saved through the choice not to import rice, US$2.60 in domestic resources was spent to produce rice locally. Finally, uncertainty in the private food market arising from NFA's operations (for example, the unexpected arrival of rice imports during harvest months) has discouraged private investment in storage and distribution facilities.

At the same time, NFA accumulated debt of over PhP170 billion by 2010, which the national government partially covers each year. These outlays usually represent the single largest government expense for agriculture (David, Intal, and Balisacan 2009; Balisacan, Sombilla, and Dikitanan 2010). Historically, the rice sector's share of the total budget of the Department of Agriculture and related (government-owned or controlled) agencies has been about 65 per cent, which is high considering its 20 per cent share of gross agricultural value-added. Moving forward, it is high time for a thorough reform of rice policy. The quantitative restriction regime needs to be replaced with tariffs, perhaps initially at the out-quota rate[6] of 35 per cent, decreasing over time to align with tariffs operating for other agricultural commodities. NFA would need to be reoriented to manage buffer stocks for emergency purposes, and the private sector would require assistance in developing logistics, particularly in terms of transport.

High Transaction Costs

The high cost of doing business — starting a business, dealing with construction permits, employing workers, registering property, getting credit, protecting investors, paying taxes, enforcing contracts, resolving insolvency — has stifled investments, especially in sectors that have potentials for decent, productive, and remunerative jobs. This stems from two basic sources: (1) the country's relatively weak institutions, and (2) its poor quality infrastructure, especially transport infrastructure. Comparison on ease of doing business between the Philippines and its East Asian region is instructive. Based on World Bank (2014*c*), the country has a relatively poor business environment, as evidenced by its rank of 95 (the 50th percentile among respondent countries), in contrast with that of 26 (the 14th percentile) for Thailand, 18 (the 10th percentile) for Malaysia, 90 (the 46th percentile) for China, 78 (the 41st percentile) for Vietnam, and 114 (the 60th percentile) for Indonesia.[7] Based on recent issues of the World Economic Forum's Global Competitiveness Report (2010, 2011), the Philippines ranked in the bottom half of over 130 respondent countries, in terms of both the quality of institutions and quality of infrastructure. In contrast, the major East Asian countries, particularly China, Malaysia, and Thailand, ranked much higher. As noted above, all these countries have done well in reducing poverty. Of the various factors, the most problematic ones for the Philippines pertain to corruption in public institutions,

inefficiency of government bureaucracy, and inadequacy of infrastructure. Domestic or foreign investors see the Philippines through this lens.

For farmers, these inefficiencies would translate into high postharvest losses; large differentials between retail (consumer) prices and farmgate (producer) prices — that is, transaction costs; and low access to income-enhancing opportunities towards diversification of farm-household incomes. For example, due partly to poor infrastructure, farmers cannot efficiently connect to supply and value chains, including export markets. Thus, they miss huge opportunities for income growth from the rapidly expanding markets for high-value crops in the rapidly growing and urbanizing centers of Asia. In terms of basic infrastructure, the Philippines has performed poorly in the provision of roads, railways, seaports, airports, power, and communications (Balisacan and Hill 2007; World Bank 2014*a*). While public investment in infrastructure (as a share of GDP) increased from about 1.5 per cent in 2011 to about 3 per cent in 2014 (and was targeted to rise to 4 per cent in 2015), the infrastructure deficits are huge, and current spending levels are still short of those of some of the country's neighbours. This poor infrastructure connectivity has created high transaction costs and lack of spatial integration, whereby the regions and provinces are bifurcated into rapidly growing regions and poorly lagging regions (Balisacan and Hill 2007). The consequence is deepening pockets of poverty where some provinces have much higher absolute poverty than others (Fuwa, Balisacan, and Bresciani 2015).

In contrast, in situations where provinces are efficiently connected and where investment in human development, particularly health and education, is location-neutral, even households in lagging provinces would benefit from growth in leading provinces. So, while concentration of production activities in certain regions, provinces, or centres is inevitable, and perhaps even desirable, possibly due to high-scale economies, efficient connectivity through infrastructure and human development would allow equitable distribution of welfare opportunities across households, regardless of economic density and geographic distance from growth centres (Balisacan, Hill, and Piza 2009; World Bank 2009*a*). Given the fiscal space that it currently enjoys, the country has the opportunity to address infrastructure bottlenecks and severe underinvestment in basic social services. Investment in transport infrastructure, in particular, should at least be brought up to the levels of the country's peers in Asia (about 6 to 8 per cent of GDP). To free up more resources for the social sector and

agriculture, and to improve efficiency in the construction, operation, and maintenance of public utilities, the regulatory and policy environment for public–private partnerships should be further improved to make infrastructure projects attractive to the private sector.

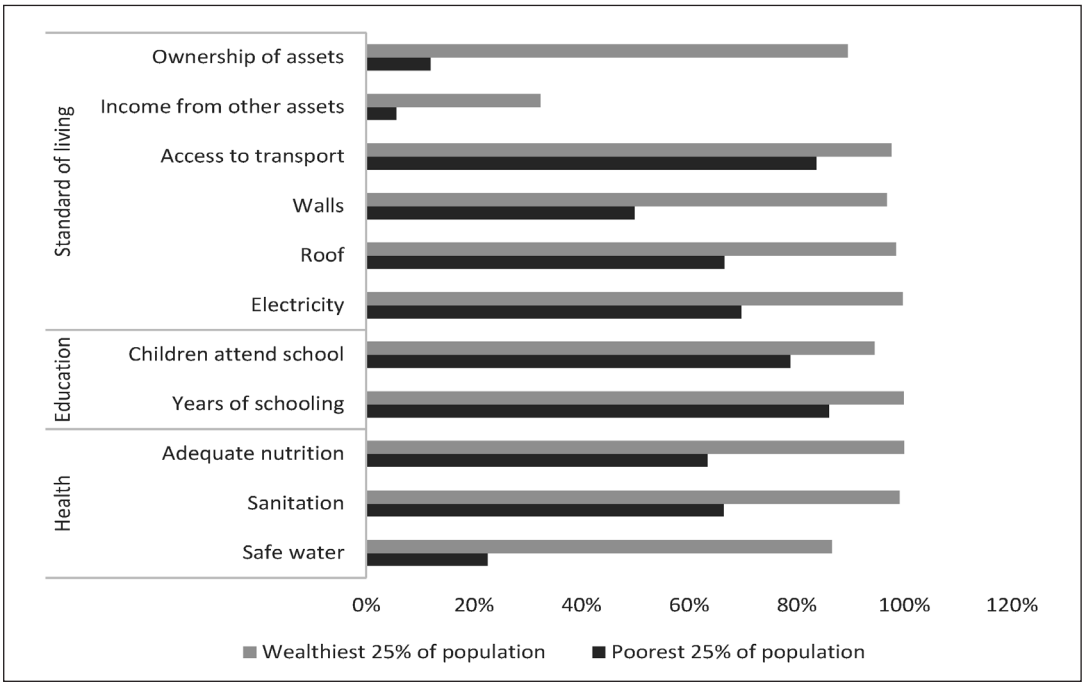
Unequal Access to Basic Social Services

The quest for equitable household welfare and opportunities in a setting where production activities are spatially concentrated highlights another key aspect of Philippine development pattern: high inequity in access to social services and assets, especially in education, health, and land. For one, a large gap exists in access to certain basic social services, such as clean water, between the bottom 25 per cent and top 25 per cent of the population (Figure 1.16). To be sure, inequity in access to social services is ubiquitous in the developing world, even in Southeast Asian neighbours, particularly Indonesia, Thailand, and Vietnam; however, this inequity is far more remarkable in the Philippines than in other East Asian countries. The high inequity in access to social services, especially health and education, is likewise highly evident across regions or provinces, or between urban and rural areas. But even within rural areas, huge disparity in access to social services is the norm. Indeed, it is this inequality within geographic areas that accounts for about three-quarters of the overall inequality in the distribution of welfare across households; inequality among these areas accounts for the remaining one-quarter of the overall inequality (Balisacan 2007).

As would be expected given inefficient connectivity, the state of poverty and inequality varies substantially across provinces. Poverty and health deprivation indicators in the Ilocos provinces (Ilocos Norte, Ilocos Sur, La Union and Pangasinan) are comparatively low, even though average per capita incomes in these provinces are not as high as those in the Southern Luzon and Central Luzon provinces. The Ilocos provinces have relatively low levels of income (and land) inequality. A partial explanation for this is the absence of plantations or haciendas that dominate rural settings in the Visayas.

The government's direct response to these inequities has been varied and included asset reforms and cash transfers intended for poor people, the most recent of which is the *Pantawid Pamilya* programme (the country's version of the *Conditional Cash Transfer* programme favoured in Latin

FIGURE 1.16
Access to Social Services and Assets: The Poorest 25 per cent Versus the Richest 25 per cent



Source: Constructed by authors based on estimates from PSA (Philippine Statistics Authority), Family Income and Expenditure Survey, 2012 <https://psa.gov.ph/content/2012-fies-statistical-tables>.

America and many other of the world's developing countries). In the past two decades, however, all but a few of the major poverty-reduction programmes have either been poorly designed or badly implemented. As such, the programmes have been grossly ineffective in achieving their goals and have become extremely expensive. The high leakage of benefits to unintended groups could actually have contributed to increased inequality. According to Manasan (2009) and World Bank (2014*b*), included among the programmes with high leakage are *Pantawid Kuryente* (with a leakage rate of about 72 per cent); the Department of Education's food-for-school programme (59–62 per cent); *Tulong para kay Lolo at Lola*, which was implemented during the 2008 global financial crisis (61 per cent); Philhealth's indigent programme (50 per cent); and NFA's rice price subsidy (41 per cent).

The *Pantawid Pamilya* programme, a key pillar of the Aquino Administration's social protection strategy, is intended to break the intergenerational cycle of poverty by ensuring that young children, particularly 0–14 year olds in poor households, would grow up healthy and stay in school. Under the programme, household beneficiaries with up to three eligible children receive a total cash grant of PhP15,000 per year if they meet certain health and education conditions. Initially launched as a pilot programme in 2008, the programme expanded rapidly from only about 1 million households in 2010 to about 4.4 million in 2014. Beginning in 2015, the programme was further expanded to cover 15–18 year olds in poor households, as well as homeless street families and indigenous people. The programme's 2015 budget was about PhP65 billion, representing about 2.5 per cent of the government's total budget, or 20 per cent of the budget for social services.

Recent assessment on the *Pantawid Pamilya* programme's initial impact shows that, overall, it has succeeded in keeping children healthy and in school (World Bank 2014*b*). Moreover, the findings of the study indicate that household beneficiaries tend to invest in their children's education and that, contrary to frequent assertions in public discussions, the programme has not encouraged dependency nor led to higher spending on undesirable ("vice") goods. These results are encouraging given the very poor performance of most poverty reduction programmes in recent decades, in terms of high leakage rates, high transfer costs per peso, and unsustainable programme benefits.

The Continuing Challenge of Property Rights Reform

Another key constraint to rural development is the country's ineffective and costly asset reform programme. In order to address high income inequality in rural areas the government has pursued asset reform programmes for the past four decades. Of these programmes, the most far-reaching was the Comprehensive Agrarian Reform Program (CARP), including its subsequent version, CARP Extension with Reforms (CARPer). The government spent an estimated PhP236 billion on CARP (in 2007 prices), which is equivalent to 20 per cent of the government's total spending on agriculture during 1988–2007. The extension of land reform for another five years under CARPer was expected to incur another PhP150 billion. To appreciate the magnitude of the financial investment involved, a major elevated roadway in the Philippines would cost about PhP1 billion.

The findings of several impact assessment studies have, at best, been mixed, in part either because the results are nonrepresentative or because comprehensive data are lacking. One result, for example, indicates a positive impact on provincial growth and hence indirectly on poverty, but a very small direct impact on poverty, especially in the past decade (Balisacan and Fuwa 2004). Using the most comprehensive dataset involving national agricultural and population censuses, nationally representative surveys of family incomes and expenditures, labour force surveys, and administrative records from implementing agencies, a team of researchers confirmed earlier results showing that the direct effect of the agrarian reform programme on poverty was disappointingly small, at least until the early 2000s (World Bank 2009*b*). In particular, the observed changes in household incomes of farmer beneficiaries in agrarian reform communities (ARCs) were higher than, although not much different from, the changes observed in comparable non-ARC farm households, all else being equal. The change in the poverty incidence observed in ARCs was also not much different from the change in non-ARCs. To be sure, because of their relatively favourable initial conditions (location, infrastructure development, and proximity to market centres), farms within ARCs tended to have higher productivity (by 15 per cent) than those in non-ARCs, but coverage was limited to only about half the programme's beneficiaries. The redistribution of private lands was found to have a positive impact in reducing poverty when it was associated with complete titling and transfer, and the effect was stronger when the norm for the transfer was

compulsory acquisition (of large, private holdings). Nevertheless, these positive effects were overwhelmed by factors relating to the programme's design and implementation, which tended to inhibit efficiency, innovation, and poverty reduction. Overall, despite the huge spending for CARP in the past two decades, the programme has little to show in terms of improving rural household welfare. Even these modest results may exaggerate the welfare effects because the counterfactual is not known. For example, if CARP has had the effect of "freezing" the land market (as discussed below), it will also have slowed agricultural productivity and put both beneficiaries and nonbeneficiaries on lower growth paths.

What has gone wrong? Although the intentions behind CARP were good, its design was poorly conceived largely because of a grossly inadequate understanding of rural development dynamics and the political economy of asset reform under a regime of weak governance. For one, CARP's provisions were highly restrictive, especially on the transferability of land titles. RA 6657 and RA 9700 (the laws creating and extending CARP, respectively) illegalized the sale or lease of land titles for ten years from the effective date of the transfer (to agrarian reform beneficiaries) and imposed an ownership ceiling of 5 hectares.[8] The transfer restriction has prevented the awarded land from being used as collateral, rendering the certificates of land ownership unbankable. This has curtailed farmers' access to credit because the restrictions effectively made the legal rural-financial market disappear. The 5-hectare ceiling on ownership, on the other hand, has prevented farmers from adjusting their scale of operations to achieve efficiency, thereby driving private capital away from agriculture.[9]

Furthermore, the most common mode of ownership transfer has been collective, not individual, titles. What matters most to formal financial intermediaries are individual, unencumbered titles — not collective titles. Disturbingly, as of October 2007, about 71 per cent or about 2 million hectares of the total land distributed under the agrarian reform programme were actually under collective ownership arrangements, about one-third of which was from government-owned lands. It is probable that the 2 million hectares have remained unproductive all these years because those lands do not carry much weight in credit access — that is, they lack or have low collateral value. But even if those lands do have collateral value, farmer beneficiaries are likely to be severely constrained from choosing production arrangements, crops, or technologies that suit their particular conditions or circumstances. For example, a farmer with sufficient farming experience

and skills may be better off operating individually rather than as part of a collective production arrangement.

CARPer ended in 2014. Lessons learned from the past forty years of land reform must not be lost. CARP's very long implementation has been extremely costly to farm efficiency and rural growth and is even detrimental to poverty reduction and equity goals. The way forward is to restore a favourable legal environment for land markets in rural areas by removing the restrictions against ownership transfer and lease of land and relaxing the land ownership ceiling to allow flexibility in the scale of farm operations. The effort should also involve urgently subdividing the collective certificate of land ownership awards into individual titles so that beneficiaries can use the lands awarded to them as collateral. Finally, any reform of land management needs to be accompanied by a strong push for the provision of public goods and support services, particularly access to well-functioning irrigation systems; profitable farming technologies; and (high-value) supply chains, including global supply chains.[10]

Climate Change, Natural Disasters, and Agriculture

Philippine climate projections show increasing means and concentrations of rainfall (Chapters 2 and 4, in this volume), implying that wet seasons will become wetter and dry seasons drier. The country's geographical location makes it vulnerable to naturally occurring events, which are projected to increase in frequency and hence increase the country's disaster risk profile (Chapter 8, this volume). When the local response capacity is limited, naturally occurring events escalate into disasters that cause great damage and human suffering, often eroding or negating social, economic, and other development gains. This is one of the important lessons of the past six years, after a single natural disaster overturned gains in certain areas and sectors of the economy. This was demonstrated through the Visayan earthquake in October 2013, followed a month later by typhoon *Haiyan* (Yolanda) in November 2013. Damages from the typhoon alone are estimated to be PhP571 billion (NEDA 2013). In 2009, direct losses to private and public assets resulting from typhoons Ondoy and Pepeng were estimated to be PhP206 billion or about 1.8 per cent of GDP (Public Commission 2009). The agricultural sector, in particular, is highly vulnerable to weather-related shocks (Chapter 10, this volume). Direct impacts like destruction of crops, farm buildings, machinery, equipment, means of

transport, stored commodities, cropland, irrigation works, and dams are immediately observable (Chapter 8, this volume). It is imperative that the country strengthen its institutional disaster preparedness. Broadly, the benefits of investing in technologies, using geohazard maps, establishing early warning systems, building dikes, and increasing awareness far exceed the associated costs. Studies on the Philippines show US$3 to US$30 worth of benefits per US$1 of investment, depending on type of disaster or hazard (Kelman and Shreve 2013).

One implication of these climatic changes for farmers is that their prior experience of the frequency, duration, strength, and timing of rainfall is less reliable than before, which increases their risk (Chapter 8, this volume) and may necessitate the State's role, for example, in making insurance available. Innovations in national weather-index insurance avoid the problem of all the households in a particular village experiencing the same disaster and thereby making claims on their insurance at the same time. Investments in research that offers farmers additional risk-reducing strategies also reduce their vulnerability to weather-related shocks; this includes research on drought-tolerant and flood-resistant crop varieties. Perez and Rosegrant (Chapter 10, this volume) show that crop yields are higher using climate-smart technologies. Other studies suggest that bundling insurance with tolerant varieties is more advantageous to farmers than doing either on its own (Lybert and Carter 2015).

Disasters classified according to the probability of their occurrence may elicit varied responses at household and national levels. For example, responses to low-probability/low-frequency natural disasters like earthquakes and volcanic eruptions may be different from the response to high-probability/high-frequency natural disasters like typhoons. Thus, variations in risks could imply the need for different policy responses. While it is broadly recognized that the benefits of investment in preparedness exceed the costs, the body of knowledge on the economics of disaster preparedness and response is scarce, especially in highly diverse geographic areas of developing countries such as the Philippines. This is partly because of sparse data and partly because of the high diversity of conditions, institutions, and geography even within a country. Accordingly, the understanding of what does and doesn't work in terms of local disaster preparedness and response is poor — despite the huge outpouring of good intentions in recent years, including public advocacies for making communities resilient to natural disasters, especially in rural areas. Clearly,

governments, multilateral institutions, and philanthropic organizations have to walk their talk by investing more in research and data to improve the current understanding of the types of policies, programmes, and projects that will be economically appropriate under developing-country conditions and circumstances. What may have worked well in developed-country settings may not provide economically efficient and sustainable solutions to the problems rural communities face in developing countries. Good-quality data and analyses are indispensable to effective, evidence-based policymaking.

CONCLUDING REMARKS

The aim of food policy should be to achieve inclusive access to food while generating long-term sources of productivity and income growth. This would require reorienting food security policy towards facilitating rather than inhibiting trade, competition, and crop diversification. In particular, quantitative restrictions combined with high rice tariffs is inconsistent with the paramount development objectives of reducing poverty and generating long-term sources of productivity and income growth in rural areas. Furthermore, the current "buy high, sell low" policy does not advance inclusive access to food, even among the poorest groups of the population. Not only is the policy poorly targeted, but even the majority of smallholder farmers and landless workers do not benefit from the high prices because they are net buyers of rice. Moreover, NFA's low consumer price is only low in reference to the domestic market, but high in relation to comparable world prices.

The way forward to achieving food security is not to artificially induce high food prices by restricting trade, particularly importation, when food supply falls short of demand at competitive world prices, but by shifting the focus of policy to efficiency-enhancing measures. These include research and development (of locally appropriate technologies), road network development, irrigation and flood control development, the facilitation of public–private partnerships, and the complete conversion of collective land titles to individual ones in order to facilitate credit flows to agriculture. Conditional cash transfers to enhance the formation of human capital in poor farm households may in turn enhance productivity and directly reduce poverty. The shift will necessarily involve changing the metric of success in agricultural development purely from increases in national food

production to increases in farm-household incomes from both agricultural and nonagricultural activities. What matters more to food security is access to food at the household level and at reasonably competitive prices. As the experience of the most food-secure countries in the world shows, access to food for all — especially among poor people — has much to with the households' purchasing power, which rises when household incomes rise, but falls when food prices rise.

The 2016 onset of the ASEAN Economic Community should provide extra pressure for the Philippines to implement long-overdue policy and governance reforms needed to foster a more competitive and shock-resilient economy, particularly in the agricultural sector. Indeed, the benefits of joining the ASEAN Economic Community — and other regional groupings — have less to do with access to larger regional markets and perhaps more to do with domestic efficiency-enhancing reforms that would otherwise be politically difficult to effect due to entrenched vested interests. The prospect of climate change makes the implementation of these reforms even more imperative. Coupled with appropriate investments, institutional reform can create a resilient Philippine economy and contribute to minimizing the impact of natural disasters when they do, inevitably, occur. Despite rather shaky global headwinds and domestic challenges, the economy is on a high growth trajectory, making it one of the world's best- performing emerging economies. The key challenge will be sustaining this growth and ensuring it is more equitable and inclusive. Reforming food policy is paramount to this objective.

APPENDIX 1: SUPPLEMENTARY TABLES

APPENDIX TABLE 1.1
Changes in the Incidence of Poverty and Growth of Agricultural Versus Nonagricultural Income, 1991–2006

Direction of Change in the Incidence of Poverty	*Number of Provinces in Which Agricultural Income Growth Was Greater Than Nonagricultural Income Growth*	*Number of Provinces in Which Agricultural Income Growth Was Less Than Nonagricultural Income Growth*
Increase	3	8
Decrease	4	58

Note: Data include a total of seventy-three provinces.
Source: Nobuhiko Fuwa, Arsenio Balisacan, and Fabrizio Bresciani, "In Search of a Strategy for Making Growth More Pro-Poor in the Philippines", *Asian Economic Papers* 14, no. 1 (2015): 202–26.

APPENDIX TABLE 1.2
Initial Conditions Affecting Sectoral Growth Elasticity of Poverty Reduction, 1991–2006

Variable	*Coefficient*	*Standard Error*
Ln (nonag Y per capita)	**–1.670*** **	**0.358**
Ln (agri Y per hectare)	**–0.230*** **	**0.083**
Time trend (year)	**–0.010*** **	**0.003**
Ln (nonag income) interacted with initial conditions of 1991		
Share of Filipinos working overseas	–0.501***	0.116
Malnutrition	6.309***	2.122
Road density	–0.372***	0.134
Income inequality	1.877**	0.846
Ln (ag income) interacted with initial conditions of 1991		
Irrigation potential	–0.674**	0.312
Rice yield	–0.289**	0.075
Constant	27.745***	6.324
Dependent variable	Ln (Provincial poverty$_{it}$)	
Number of observations	402	
R-squared	0.550	
F-test (all coefficients zero)	39.116	

Notes: Results are based on provincial panel data for 1991–2006 using a fixed-effects model; other provincial fixed effects, such as local political characteristics, urban–rural disparity, and schooling of household head, were not statistically significant and hence are not shown; ** and *** indicate confidence at the 5 and 1 per cent levels, respectively.
Source: Nobuhiko Fuwa, Arsenio Balisacan, and Fabrizio Bresciani, "In Search of a Strategy for Making Growth More Pro-Poor in the Philippines", *Asian Economic Papers* 14, no. 1 (2015): 202–26.

APPENDIX TABLE 1.3
Total Department of Agriculture Budget and Shares of Major Outputs, 2000–15

AFMA Component/MFO	*2000 GAA*	*2001 Reenacted*	*2002 GAA*	*2003 GAA*	*2004 Reenacted*	*2005 GAA*	*2006 Reenacted*	*2007 GAA*	*2008 GAA*	*2009 GAA*	*2010 GAA*	*2011 GAA*	*2012 GAA*	*2013 GAA*	*2014 GAA*	*2015 GAA*
	Share (%)															
Production support	19.3	23.2	17.8	22.4	24.8	23.4	23.9	18.9	19.5	23.1	10.3	8.0	8.9	9.4	21.8	30.1
Market development	0.8	0.8	0.4	0.3	0.4	0.4	0.4	0.5	1.0	1.6	1.6	2.9	2.0	1.8	0.6	4.0
Credit facilitation	2.3	1.0	0.6	0.7	0.9	1.0	0.9	0.6	0.4	0.4	0.2	0.2	0.2	2.7	0.1	4.0
Irrigation development	24.9	30.8	36.3	28.3	26.1	30.5	29.6	39.1	29.9	28.7	28.4	35.5	41.6	38.9	28.7	3.2
Postharvest facilities and other infrastructure (including FMR)	23.0	8.0	7.1	8.0	7.0	12.3	14.2	10.5	22.3	17.8	19.6	18.2	19.6	17.3	16.9	22.7
Agricultural equipment and facilities support services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.3	8.0
ESETS	6.6	6.6	4.3	4.2	3.6	4.4	3.6	3.9	3.7	5.1	5.1	8.2	4.0	4.2	4.6	7.5
ESETS salary supplement for extension workers under local government agencies	0.0	2.1	2.4	2.7	3.2	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0
ESETS human resource development	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Research and development	6.4	4.6	4.1	3.2	3.7	3.7	2.5	3.0	2.9	2.2	2.2	3.8	2.5	2.0	3.1	5.5
Information services	1.1	0.6	0.7	1.2	0.4	0.7	0.8	1.2	0.5	0.8	2.9	1.6	0.4	0.4	0.0	0.0
Regulatory services	2.9	1.8	5.7	9.8	6.7	1.9	1.7	1.7	1.8	1.6	2.8	2.6	2.1	3.6	1.9	3.1
Policy formulation, planning and advocacy services	0.0	0.2	0.2	1.8	2.3	3.3	3.5	3.4	1.7	2.3	3.6	5.7	2.5	3.6	0.3	0.5
Total operations	*87.4*	*79.7*	*79.7*	*82.6*	*79.1*	*81.6*	*81.1*	*82.8*	*83.8*	*84.5*	*76.7*	*86.6*	*83.8*	*83.8*	*83.2*	*88.5*
GASS and STO	7.2	9.3	12.9	7.6	9.3	9.1	8.6	7.5	5.5	3.5	3.5	4.8	3.2	3.1	4.4	6.5
Total operations, GAS, and STO	*94.6*	*89.1*	*92.6*	*90.2*	*88.4*	*90.7*	*89.7*	*90.3*	*89.3*	*88.0*	*80.2*	*91.3*	*87.0*	*86.9*	*87.6*	*95.1*
Subsidy to attached corporations	5.4	10.9	7.4	9.8	11.6	9.3	10.3	9.7	10.7	12.0	19.8	8.7	13.0	13.1	12.4	4.9
Total Department of Agriculture budget (billion PhP)	**18.65**	**13.40**	**15.88**	**12.70**	**9.56**	**9.09**	**8.87**	**10.72**	**13.90**	**24.46**	**24.11**	**17.26**	**27.30**	**32.74**	**33.64**	**22.90**

Notes: AFMA = Agriculture and Fisheries Modernization Act; ESETS = Extension support, education, and training services; FMR = farm-to-market roads; GAA = General Appropriations Act; GASS = general administration and support services; MFO = major final outputs; STO = support to operation. Data for the total budget are presented in real Philippine pesos, deflated by the wholesale price index (WPI) with a base year of 1998.
Source: Constructed by authors from DBM (Department of Budget and Management), Philippines General Appropriations Act, various years, retrieved from <http://www.dbm.gov.ph/index.php/dbm-publications/general-appropriations-act-gaa>.

Notes

The authors gratefully acknowledge the excellent research assistance of Jan Carlo Punongbayan, Shirra de Guia, and J. Kat Magadia. The authors are also grateful for comments and suggestions by participants of the IFPRI-NEDA project workshop held in Tagaytay City. Any errors of commission or omission are the sole responsibility of the authors and should not be attributed to any of the above or to their respective affiliations.

This paper was completed in early 2016. Any views, statements or analyses expressed in this paper are those of the authors and should not be attributed to those of the Philippine Competition Commission, National Economic and Development Authority, or Ateneo de Manila University, except where they specify the contrary.

1. Although many services, such as the outsourcing business processes, have also become tradable due to advances in technology.
2. Note that the drastic reduction in the irrigation budget in 2015 was due to the transfer of the National Irrigation Administration from the Department of Agriculture to the Office of the Presidential Assistant for Food Security and Agricultural Modernization (OPAFSAM).
3. Firmed-up service area is equivalent to the service area, less any land either converted from agricultural to nonagricultural uses or considered permanently "nonrestorable" (that is, having either insufficient water or irrigation facilities that can no longer be completed for technical reasons).
4. Responsibility for public research and extension rests with the Department of Agriculture through its national research agencies, regional integrated research centres, the Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development within the Department of Science and Technology, and the state colleges and universities.
5. Note that oversight of NFA was transferred to the OPAFSAM in 2014.
6. Out-quota rates are tariffs imposed on imports that exceed quantitative restrictions and, hence, are typically prohibitively higher than in-quota rates.
7. For example, the cost of starting a business (as a share of per capita income) is substantially higher in the Philippines (17 per cent) than in Malaysia (7 per cent), Thailand (7 per cent), China (1 per cent), and Vietnam (5 per cent). On average, it would take 34 days to start a business in the Philippines, whereas the comparable timespans for Malaysia, Thailand, and Vietnam are 6, 28, and 34 days, respectively (World Bank 2014*c*).
8. An additional requirement for transferability is that the beneficiary must have paid off the Land Bank, which would likely take 30 years or more.
9. While economies of scale at five hectares could arguably be captured for rice cultivation, the same could not be said for crops like sugar and coconuts, especially if economies of scale in markets and production are considered.
10. Cognizant of the distinction between farm workers and farmers, a two-pronged approach would perhaps make sense, involving a much freer approach towards

beneficiaries wanting to sell their land and the development of market-based support services for those wanting to remain in farming. The best way to develop supply chains is through the private sector, possibly led by larger commercial farmers.

References

Anderson, Kym. "Economic Growth, Structural Change and the Political Economy of Protection". In *The Political Economy of Agricultural Protection*, edited by K. Anderson and Y. Hayami. London: Allen & Unwin, 1986.

———, Yujiro Hayami, and Masayoshi Honma. "The Growth of Agricultural Protection". In *The Political Economy of Agricultural Protection*, edited by K. Anderson and Y. Hayami. London: Allen & Unwin, 1986.

———, Marianne Kurzweil, Will Martin, Damiano Sandri, and Ernesto Valenzuela. "Methodology for Measuring Distortions to Agricultural Incentives". *Agricultural Distortions*. Washington, D.C: World Bank, 2008.

Aragon, Corazon, Artemio Salaza, Antonio Quilloy, and Gideon Carnaje. "Increasing Agricultural Productivity in the Philippines". Laguna Philippines: University of the Philippines Los Baños (UPLB) – College of Economics and Management (CEM), 2011.

Aquino, Albert, Anita Tidon, Princess Ani, and Meliza Festejo. "The Agriculture and Fisheries Modernization Act of 1997: A Collective Approach to Competitiveness". 2013 <http://ap.fftc.agnet.org/ap_db.php?id=77> (accessed 25 May 2016).

Balisacan, Arsenio. "Demand for Food in the Philippines: Responses to Price and Income Changes". *Philippine Review of Economics and Business* 31 (1994): 137–63.

———. "Why Does Poverty Persist in the Philippines? Facts, Fancies, and Policies". In *Whither the Philippines in the 21st Century?* edited by R. Severino and L. Salazar. Singapore: Institute of Southeast Asian Studies, 2007.

———. "The Growth-Poverty Nexus: Multidimensional Poverty in the Philippines". In *Sustainable Economic Development: Resources, Environment and Institutions,* edited by A. Balisacan, U. Chakravorty, and M. Ravago. Oxford and San Diego: Elsevier Academic Press, 2015.

——— and Nobuhiko Fuwa. "Going Beyond Cross-Country Averages: Growth, Inequality and Poverty Reduction in the Philippines". *World Development* 32, no. 11 (2004): 1891–907.

——— and Hal Hill, eds. *The Dynamics of Regional Development: The Philippines in East Asia.* Cheltenham, U.K.: Edward Elgar, 2007.

——— and James Roumasset. "Public Choice of Economic Policy: The Growth of Agricultural Protection". *Weltwirstschaftlitches Archiv* 123, no. 2 (1989): 232–48.

———, Hal Hill, and Sharon Piza. "Spatial Disparities and Development Policy

in the Philippines". In *Reshaping Economic Geography in East Asia,* edited by Y. Huang and A. Bocchi. Washington, D.C.: World Bank, 2009.

———, Leocadio Sebastian, and associates. *Securing Rice, Reducing Poverty: Challenges and Policy Directions.* Los Baños: The Southeast Asian Regional Center for Graduate Study and Research in Agriculture, Philippine Rice Research Institute, and Bureau of Agricultural Research of the Philippine Department of Agriculture, 2006.

———, Mercedita Sombilla, and Rowell Dikitanan. "Rice Crisis in the Philippines: Why Did It Occur and What Are Its Policy Implications?". In *The Rice Crisis: Markets, Policies and Food Security,* edited by D. Dawe. Rome: Food and Agricultural Organization of the United Nations; and London: Earthscan, 2010.

Besley, Timothy, and Louise Cord, eds. *Operationalizing Pro-Poor Growth: Synthesis and Country Experiences*. London: Palgrave Macmillan, 2006.

Boserup, Ester. *The Conditions of Agricultural Growth*. London: Allen & Unwin, 1965.

———. *Population and Technological Change: A Study of Long-Term Trends*. Chicago: University of Chicago Press, 1981.

Clark, Colin. *The Conditions of Economic Progress*. London: Macmillan, 1940.

Chenery, Hollis, and Moises Syrquin. *Patterns of Development, 1950–1970*. New York: Oxford University Press, 1975.

David, Cristina. "Agriculture". In *The Philippine Economy: Development, Policies, and Challenges,* edited by A. Balisacan and H. Hill. New York: Oxford University Press, 2003.

———, Ponciano Intal, and Arsenio Balisacan. "The Philippines". In *Distortions to Agricultural Incentives in Asia*, edited by K. Anderson and W. Martin. Washington, D.C.: World Bank, 2009.

de Dios, Emmanuel and Jeffrey Williamson. "Deviant Behavior: A Century of Philippine Industrialization". In *Sustainable Economic Development: Risk, Resources and Governance,* edited by A. Balisacan, U. Chakravorty, and M. Ravago. Oxford and San Diego: Elsevier Academic Press, 2015.

Deaton, Angus. "Demand Analysis". In *Handbook of Econometrics.* Amsterdam and New York: New-Holland, 1986.

DBM (Department of Budget and Management). Philippines General Appropriations Act. Various years. Retrieved from <http://www.dbm.gov.ph/index.php/dbm-publications/general-appropriations-act-gaa>.

Dollar, David, and Kraay Aart. "Growth Is Good for the Poor". *Journal of Economic Growth* 7, no. 3 (2002): 195–225.

Dy, Rolando. "Private-Sector Investment and Rural Growth". Report submitted to the World Bank Office Manila, 2005 <http://documents.worldbank.org/curated/en/320121468146718043/pdf/366940PH0P09191e0Sector0WP01PUBLIC1.pdf> (accessed 25 May 2016).

FAO (Food and Agriculture Organization of the United Nations). FAOSTAT database. Various years <http://faostat3.fao.org/home/E> (accessed 17 May 2015).

Francisco, Sergio and Flordeliza Bordey. "Research, Development and Extension". In *Productivity Growth in Philippine Agriculture*, edited by R. Briones, M. Sombilla, and A. Balisacan. Los Baños: Southeast Asian Regional Center for Graduate Study and Research in Agriculture, Philippine Rice Research Institute, and Bureau of Agricultural Research of the Department of Agriculture, 2014.

Fuwa, Nobuhiko, Arsenio Balisacan, and Fabrizio Bresciani. "In Search of a Strategy for Making Growth More Pro-Poor in the Philippines". *Asian Economic Papers* 14, no. 1 (2015): 202–26.

Habito, Cielito, and Roehlano Briones. "Philippine Agriculture over the Years: Performance, Policies and Pitfalls". Paper presented at the Conference "Policies to Strengthen Productivity in the Philippines", Makati City, the Philippines, June 2005.

Huang, Jikun, J. Yang, and Scott Rozelle."China's Agriculture: Drivers of Change and Implications for China and the Rest of World". *Agricultural Economics* 41 (2010): 47–55.

Kelman, Ilan and Cheney Shreve, ed. "Disaster Mitigation Saves". Version 12. 2013 <www.ilankelman.org/miscellany/MitigationSaves.doc> (accessed 5 May 2015).

Krueger, Anne, Maurice Schiff, and Alberto Valdes, eds. *The Political Economy of Agricultural Pricing Policy*. Vol 2: Asia. Baltimore: Johns Hopkins University Press, 1991.

Kuznets, Simon. *Modern Economic Growth: Rate, Structure and Spread*. New Haven: Yale University Press, 1966.

Llanto, Gilberto. "Rural Finance". In *Securing Rice, Reducing Poverty: Challenges and Policy Direction*, edited by A. Balisacan, L. Sebastian, and associates. Los Baños: The Southeast Asian Regional Center for Graduate Study and Research in Agriculture, Philippine Rice Research Institute, and Bureau of Agricultural Research of the Philippine Department of Agriculture, 2006.

Lybert, Travis and Michael Carter. "Bundling Drought Tolerance and Index Insurance to Reduce Rural Household Vulnerability to Drought". In *Sustainable Economic Development: Resources, Environment, and Institutions,* edited by A. Balisacan, U. Chakravorty, and M. Ravago. Oxford and San Diego: Elsevier Academic Press, 2015.

Lucas, Robert. "Making A Miracle". *Econometrica* 61, no. 2 (1993): 251–72.

———. *Lectures on Economic Growth*. Cambridge: Harvard University Press, 2001.

Manasan, Rosario. "Reforming Social Protection Policy: Responding to the Global Financial Crisis and Beyond". Makati: Philippine Institute for Development Studies, 2009.

Mapa, Dennis, Kristelle Castillo, and Krizia Francisco. *Rice Price, Job Misery, Hunger Incidence: Need to Track Few More Statistical Indicators for the Poor.* Quezon City: School of Statistics, University of the Philippines, Diliman, 2015.

NEDA (National Economic and Development Authority). "Reconstruction Assistance on Yolanda (RAY)". 2013. <www.neda.gov.ph/wp-content/uploads/2013/12/RAY-DOC-FINAL.pdf> (accessed 17 May 2015).

Ponce, Eliseo and Rolando Dy. "Convergence Mechanisms and Quality Improvements in the Provision of Support Services to Agrarian Reform Beneficiaries". Report submitted by Technical Working Group 2 for the study commissioned by an Inter-Agency Committee led by the National Economic Development Authority on Institutional Arrangements for Land Management and Rural Development, 2014.

PSA (Philippine Statistics Authority). "Annual Poverty Indicators Survey". Incidence of multidimensional versus income-based poverty. Various years [a] <https://psa.gov.ph/iuse/apis> (accessed 16 May 2017).

———. "Family Income and Expenditure Survey". Incidence of multidimensional versus income-based poverty. Various years [b] <http://web0.psa.gov.ph/content/family-income-and-expenditure-survey-fies> (accessed 16 May 2017).

———. "Import/export data". Various years [c]. <http://countrystat.psa.gov.ph/?cont=12&pageid=59555B5A1D737166767A78671D056D677A1D066C77667D646118056D74617B64611A4A5A58> (accessed 16 May 2017).

———. "Labor Force Survey". October round. Various years [d]. <www.psa.gov.ph/statistics/survey/labor-force> (accessed 16 May 2017).

———. "National Demographic and Health Survey". Incidence of multidimensional versus income-based poverty. Various years [e] <https://psa.gov.ph/survey/demographic-and-health> (accessed 16 May 2017).

———. "National Income Accounts". Various years [f] <www.psa.gov.ph/> (accessed 16 May 2017).

———. "Poverty Incidence by Region". Various years [g] <www.nscb.gov.ph/poverty/dataCharts.asp> (accessed 16 May 2017).

———. "Value and Share of Agricultural Trade". Various years [h] <http://countrystat.psa.gov.ph/> (accessed 16 May 2017).

———. "Gross Value Added in Agriculture, Fishery, and Forestry". Various years [i] <http://countrystat.psa.gov.ph/?cont=10&pageid=1&ma=E10PNGVA> (accessed 16 May 2017).

———. "Production". Various years [j] <http://countrystat.psa.gov.ph/?cont=10&pageid=1&ma=B50PNCLP> (accessed 16 May 2017).

———. "Land Use". Various years [k] <http://countrystat.psa.gov.ph/?cont=10&pageid=1&ma=B50PNCLP> (accessed 16 May 2017).

———. "Prices." Various years [l] <http://countrystat.psa.gov.ph/> (accessed 16 May 2017).

———. "Family Income and Expenditure Survey". 2015 <http://web0.psa.gov.ph/content/family-income-and-expenditure-survey-fies> (accessed 16 May 2017).

———. Family Income and Expenditure Survey, 2012 <https://psa.gov.ph/content/2012-fies-statistical-tables>.

Public Commission."Typhoons Ondoy and Pepeng: Post-Disaster Needs Assessment". Main report by the Special National Public Reconstruction Commission and Global Facility for Disaster Reduction and Recovery, 2009 <www.pdf.ph/downloads/PDNA/PDNA%20Main%20Report%20(Vol%201).pdf> (accessed 20 May 2015).

Ravago, Majah-Leah and Amy Cruz. *Southeast Asian Agriculture and Development Primer Series*. Los Baños: Southeast Asian Regional Center for Graduate Study and Research in Agriculture, 2004.

———, James Roumasset, and Arsenio Balisacan. "Economic Policy for Sustainable Development vs. Greedy Growth and Preservationism". In *Sustainability Science for Watershed Landscapes*, edited by J. Roumasset, K. Burnett, and A. Balisacan, eds. Los Baños: Southeast Asian Regional Center for Graduate Study and Research in Agriculture; and Singapore: Institute of Southeast Asian Studies, 2010.

——— and Arsenio Balisacan. "Agricultural Policy and Institutional Reforms in the Philippines: Experiences, Impacts, and Lessons". *Southeast Asian Agriculture and Development Primer (SAADP) Second Series,* SEARCA, 2016.

Reardon, Thomas and C. Peter Timmer. "The Supermarket Revolution with Asian Characteristics". In *Reasserting the Rural Development Agenda: Lessons Learned and Emerging Challenges in Asia*, edited by A. Balisacan and N. Fuwa. Los Baños: Southeast Asian Regional Center for Graduate Study and Research in Agriculture; and Singapore: Institute of Southeast Asian Studies, 2007.

———, C. Peter Timmer, and Bart Minten. "Supermarket Revolution in Asia and Emerging Development Strategies to Include Small Farmers". *Proceedings of the National Academy of Sciences of the United States* 109, no. 31 (2012): 12332–37.

Reyes, Celia, Christian Mina, Reneli Gloria, and Sarah Mercado. *Review of Design and Implementation of the Agricultural Insurance Programs of the Philippine Crop Insurance Corporation*. Quezon City: Philippine Institute of Development Studies, 2015.

Roumasset, James. "Market Friendly Food Security: Alternatives for Restructuring NFA". Mimeographed. Department of Economics, University of Hawaii, Honolulu, 2000.

SEPO. Financing Agriculture Modernization: Risks & Opportunities. 2009. <https://www.senate.gov.ph/publications/PB%202009-01%20-%20Financing%20Agriculture%20Modernization.pdf> (accessed 20 May 2015).

Sombilla, Mercedita and Karen Quilloy. "Strengthening the Philippine Rice Seed

System". Paper submitted to the Regional Strategic Analysis and Knowledge Support Systems in Asia (ReSAKSS-Asia) Program, International Food Policy Research Institute. Washington, D.C., 2014.

Teruel, Romeo and Jesus Dumagan. "Total Factor Productivity Growth in Philippine Agriculture". In *Productivity Growth in Philippine Agriculture,* edited by R. Briones, M. Sombilla, and A. Balisacan. Los Baños: Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA); Muñoz, Nueva Ecija: Philippine Rice Research Institute (PhilRice); and Quezon City: Department of Agriculture-Bureau of Agricultural Research, 2014.

Timmer, C. Peter. "The Agricultural Transformation". In *Handbook of Development Economics*, Vol. 1, edited by H. Chenery and T. Srinivasan. Amsterdam: North Holland, 1988.

———. Agriculture Pro-poor Growth: An Asian Perspectives. *Working Paper 63.* Washington, D.C.: Center for Global Development, 2005.

———. *A World without Agriculture: The Structural Transformation in Historical Perspective*. Washington, D.C.: AEI Press, 2007.

——— and Selvin Akkus. *The Structural Transformation as a Pathway out of Poverty: Analytics, Empirics and Politics.* Washington, D.C.: Center for Global Development, 2008.

World Bank. PovcalNet. Various years <http://iresearch.worldbank.org/PovcalNet/> (accessed 20 May 2015).

———. *Philippines: Agriculture Public Expenditure Review*. Technical Working Paper. Washington, D.C.: Rural Development, Natural Resources, and Environment Sector Unit of the Sustainable Development Department for the East Asia and Pacific Region, 2007.

———. *World Development Report: Agriculture for Development.* Washington, D.C., 2008.

———. *World Development Report: Reshaping Economic Geography.* Washington, D.C., 2009*a*.

———. *Land Reform, Rural Development, and Poverty in the Philippines: Revisiting the Agenda.* Technical Working Paper. Washington, D.C., 2009*b*.

———. *Investing in the Future: Sharing Growth and Job Opportunities for All.* Philippine Economic Update. Manila, 2014*a*.

———. *Keeping Children Healthy and in School: Evaluating the Pantawid Pamilya Using Regression Discontinuity Design.* Second Wave Impact Evaluation Results. Manila, 2014*b*.

———. "Ease of Doing Business Rankings". 2014*c* <www.doingbusiness.org/rankings> (accessed 20 May 2015).

———. *Philippine Economic Update: Making Growth Work for the Poor.* Manila, 2015*a*.

———. "Nutrition Country Profiles: Philippines". 2015*b*. <http://siteresources.

worldbank.org/NUTRITION/Resources/281846-1271963823772/Philippines.pdf> (accessed 20 May 2015).

World Economic Forum. *The Global Competitiveness Report 2010–2011,* 2010 <www3.weforum.org/docs/WEF_GlobalCompetitivenessReport_2010-11.pdf> (accessed 20 May 2015).

———. *The Global Competitiveness Report 2011–2012,* 2011 <www3.weforum.org/docs/WEF_GCR_Report_2011-12.pdf> (accessed 20 May 2015).