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by

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Current Structure and Future Challenges of the Agricultural Sector

Majah-Leah V. Ravago^{*} and Arsenio M. Balisacan[‡]

Abstract

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

Keywords: Philippine agriculture, structural transformation, poverty

JEL Keywords: Q10, Q17, Q18

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1. Introduction: The macro-setting

The performance of the Philippine economy at the turn of the century has not been much different from its boom-bust characteristics in the past. Relative to its Asian neighbors, the country's growth rates during the period (2000-2010) were lackluster. The Philippines, a lower-middle income country with an average decadal gross domestic product (GDP) growth of 4.7 percent, was in the bottom three, higher only than Malaysia and Thailand, both of whom were upper-middle income countries with per capita GDP of about four-fold and twice, respectively, of that for the Philippines. Like the rest of its neighbors, the country did not escape the global financial crisis in 2007-2008 triggered by the so-called subprime mortgages in the American housing market. Nevertheless, the economy weathered the crisis, managing to post a positive growth of 1.2 percent, in contrast to the negative growth posted by Thailand, Singapore and Malaysia in 2009. The impact of the crisis was dampened by the relatively limited exposure of the country's financial market to risky assets; the flow of remittances that continuously expanded consumer expenditure; the relatively strong performances of manufacturing, construction, and trade; and the fact that the country's growth was coming from a low base.

Recently, the confidence in the economy has improved considerably, resulting in quite impressive performance. The new Aquino administration (2010-2016) has anchored its platform of sustainable and inclusive growth on fighting corruption, pursuing peace and order, and governance reform. The average annual growth for 2010-2014 was 6.3 percent, the country's highest 5-year average growth in 40 years. This pace of growth, which peaked at 7.2 percent in 2013, has put the country among the fastest growing developing economies in the world. The performance has earned for the country upgrades in various global competitiveness rankings and, in its history, unprecedented credit and investment rating upgrades. Progress is, however, slower in the social sector. Poverty in the country is high by the standard of the country's peers and reduction has, so far, responded weakly to the growth. Underemployment remains high at close to 20 percent. Clearly, much work remains to be done to veer away from the boom-bust pattern of postwar growth and achieve the elusive sustained and inclusive growth.

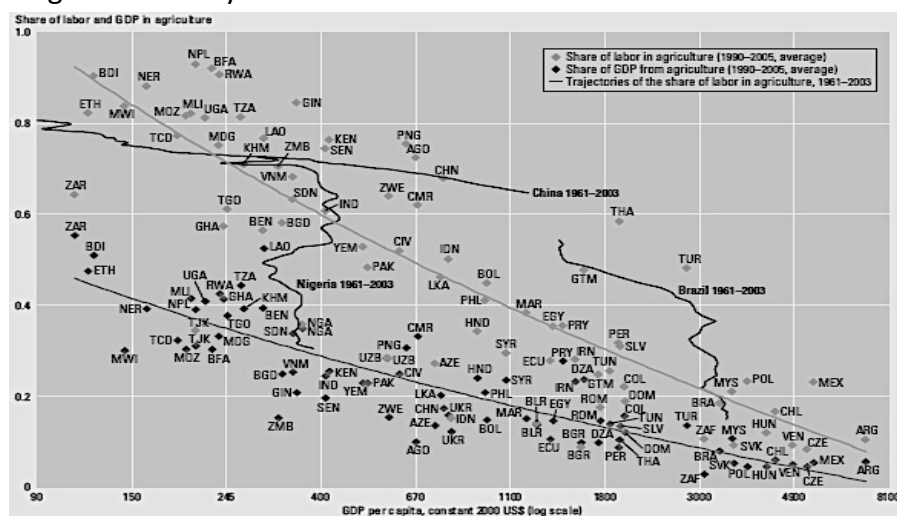
Sustaining economic growth over the medium- to long-term has much to do with the country's structural transformation, especially involving the shift of economic activity from low-productivity areas or sectors to high productivity areas or sectors. Raising productivity in agriculture is key to efficient and poverty-reducing structural transformation. While the share of agriculture in the economy continues to decline as development proceeds, it faces enormous opportunities for income growth and poverty reduction from the rapidly changing food markets in Asia. However, the country's ability to seize these opportunities has been hampered by policy and governance constraints, thus, holding back Filipino farmers from taking advantage of these opportunities. Basic reforms are required to strengthen the contribution of agriculture in the Philippine economy.

This chapter provides a background of the Philippine agriculture starting at the turn of the century. The succeeding section presents the overview of the patterns, composition, and the policy and institutional environment that has influenced the performance of the agriculture sector in recent years. The focus is on the changing dynamics of supply and demand for agriculture as a whole and for key commodity groups and livestock in the context of a growing economy, urbanization, and regional market integration. It concludes with a discussion on the policy and institutional challenges to making agriculture a key pillar in the country's pursuit of inclusive growth, poverty reduction, and sustainable development.

2. Agriculture and the Structural transformation

Much of the success of the newly developed and major emerging countries in poverty reduction, particularly in Asia, has to do with sustained economic growth and structural transformation. In this chapter, structural transformation refers to the shift of economic activity from low-productivity areas or sectors to high-productivity areas or sector of the economy. Broadly, this is associated with the decline, in terms of relative importance, of agriculture in a country's labor force and total output as income per capita rises. This "stylized fact" of development has been widely documented in the literature, following the works of Clark (1940), Kuznets (1966), and Chenery and Syrquin (1975) using both cross-section and time-series data. The pattern is quite "uniform and pervasive" (Timmer 1988), be it in the socialist or capitalist countries, Asian, Latin American, and African. The World Development Report (World Bank 2008) reaffirms these stylized facts, as shown in Figure 1.

Figure 1. The stylized facts of structural transformation



Source: World Development Report 2008 (Figure 1.2).

Note: The list of 3-letter codes and the countries they represent can be found on WDR 2008, p. xviii.

The "flying geese" metaphor for the Asian Tigers also exemplifies this pattern of structural transformation (Ravago, Roumasset, and Balisacan 2010). The lead goose was Japan, followed by the New Industrializing Economies (NIE) of South Korea, Taiwan, Singapore, and

Hong Kong. The third layer consists of Malaysia, Thailand and Indonesia, with the Philippines and Vietnam trailing behind.

The development process also requires that the general economic growth be accompanied or preceded by rapid agricultural growth (Timmer 1988). Moreover, the structural transformation involves a seeming paradox that the declining importance of agriculture in the economy 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 the development process, the economy is largely agricultural, labor is employed mainly in the farm, and the country exports food (agricultural commodities) to defray manufactured imports. At this initial stage, non-farm capital is low. Per capita land endowment determines the average incomes. Capital accumulation and innovation barely surpass diminishing labor productivity and population pressure. But the latter also induces some innovation and specialization in the agricultural sector (Boserup 1965, 1981). This, together with capital accumulation, eventually leads to the emergence of industrialization as the manufacturing sector attracts labor out of agriculture. Labor is released from the low productivity areas of agriculture. Manufacturing and the surplus from agricultural development create capital accumulation. This facilitates labor-intensive manufacturing industries to become 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 sooner the emergence of the manufacturing sector will be, hence, the sooner the drop of the agriculture exports to imports ratio. And the more rapid is the progress of non-farm relative to farm technological progress and the faster the industrial capital accumulation, the faster is the decline in the comparative advantage of agriculture and the fall in its share in labor employment. Specialization and capital accumulation together increase the return to human capital formation, lowering fertility, which then enhances the virtuous cycle of industrial revolution (Lucas 1993, 2001). The final stage of structural transformation is often referred to as "de-industrialization," whereby the services sector grows relative to industry. The demand for services is income-elastic. As households' incomes increase, a higher proportion of their income is spent on services. On the supply side, many of these services are domestically-produced¹ because they are largely non-tradeable. In addition, services production is relatively labor-intensive. This explains the eventual movement of the workforce out of the manufacturing (and agriculture) to the services sector. Furthermore, this reinforces the decline of the agriculture's shares of output and employment as development proceeds.

Anderson (1986) draws two important conclusions from the simple open and growing economy model. First, while agriculture product is the most important export in 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 becomes a net food importer, and will, given land endowment, occur sooner the higher the population growth is. Second, employment and

¹ Although many services have increasingly become tradable as well due to advancement in technology, e.g., business process outsourcing (BPO).

output of agriculture will grow relatively slower as both the industrial and services sector expand making the agriculture sector relatively less important in the economy. Relatedly, by Engel's Law, the share of food in household expenditure declines as income increases. Hence, as development proceeds, food prices become increasingly less important determinant of household welfare.

Recent development experience also ties sustained poverty reduction to structural transformation (Timmer 2007; Dollar and Kraay 2002; Besley and Cord 2006). The movement of labor from low-productivity areas or sectors to high-productivity areas or sectors of the economy, which has been associated with the stylized pattern of development described above, is key to the progress in poverty reduction, especially in Asia. Such movement is also associated with sustained overall economic growth. Hence, the empirically observed link between overall economic growth and poverty reduction is not surprising (Dollar and Kraay 2002). Similarly, the "growth elasticity" of national poverty reduction is found empirically to be even higher in cases where agricultural growth is robust (Timmer and Akkus 2008; Timmer 2005).

Despite important role of agriculture in facilitating structural transformation and speeding up poverty reduction, a mix of market failures and political economy issues stifles the sector's potentials and undermines development efforts to achieve shared prosperity. To be sure, the political economy of agricultural protection (or un-protection) is also a consequence of the structural transformation itself (Timmer 2007; Anderson 1986; Anderson, Hayami, and Honma 1986; Balisacan and Roumasset 1989).

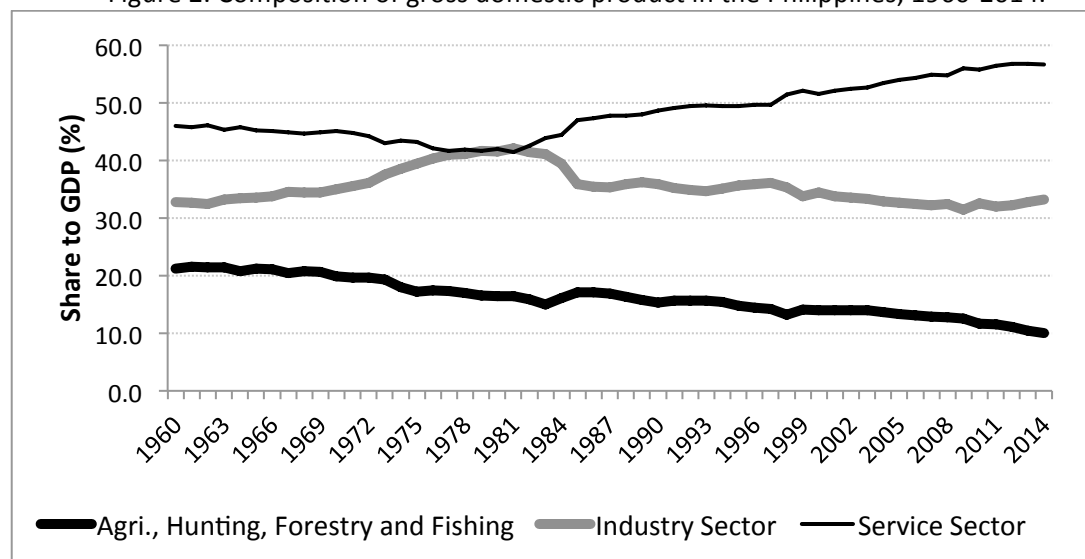
a. Philippines Structural transformation in output

The Philippine experience is quite unique and did not follow the development experience of many countries. Different from the structural transformation of its neighbors, the country largely skipped the primary engine of growth – manufacturing for export (Balisacan and Hill 2007; de Dios and Williamson 2015). The average decadal share of industrial GDP fell from 38 percent in the 1980s to 35 percent in the 1990s and to 33 percent in 2000s (Figure 2). Over the same period, the share of agriculture in total output fell from 16 percent to 15 percent to 13 percent. On the other hand, the corresponding share of the services sector expanded from 45 percent in the 1980s to 50 percent in 1990s and to 54 percent in 2000s. The declining trend in the agriculture sector and the expansion in the services sector continued in the most recent years with a respective share of 10.8 percent and 56.7 percent, respectively, in 2011 and 2014. However, the share of industrial GDP remained at about 33 percent in 2011-2014. That the period saw the manufacturing sector bottoming up could reflect the government efforts to "rebalance" the sources of economic growth, particularly drawing more growth from industry, especially manufacturing, investment, and exports, while reducing dependence on remittances-fuelled household consumption and services.

Moreover, the past three decades saw the economy moving from being largely agricultural to having an expanded services sector and skipping industrial development. The

pattern deviates from the typical experience of recently developed economies, particularly in East Asia. While the Philippines' growth has been restrained, South Korea's accelerated. Lucas (1993) refers to the continuing transformation of South Korea as a miracle, similar to what had transpired in Taiwan, Hong Kong and Singapore.

Figure 2. Composition of gross domestic product in the Philippines, 1960-2014.



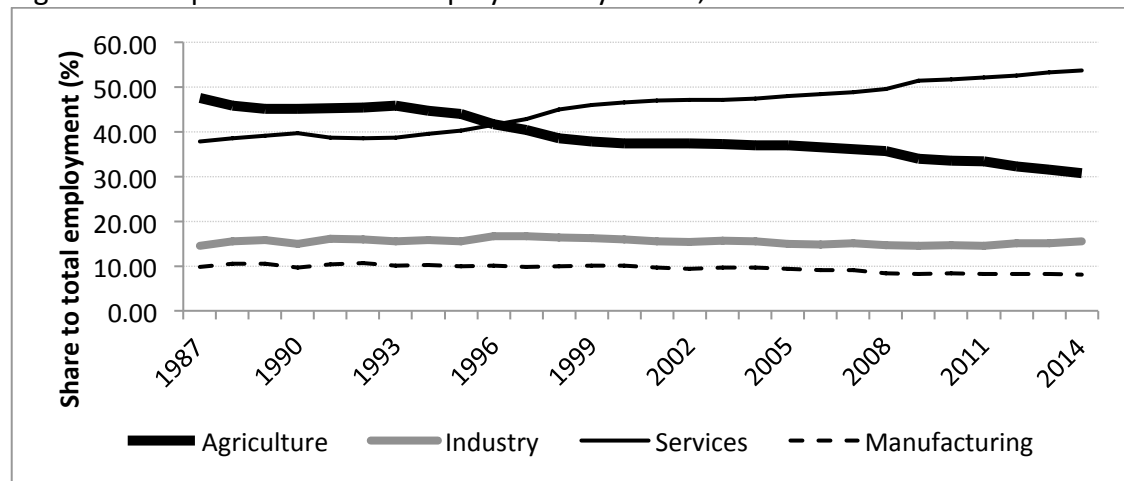
Source of basic data: Philippine Statistical Authority (PSA), National Income Accounts.

b. Structural transformation in employment

The structural transformation in employment follows the development process in output, albeit expectedly, with a lag (Figure 3). Agriculture had been the largest provider of employment nationwide in the 1980s at 51 percent. However, its share in total employment went down to 40 percent in the late 1990s and by, 2010-2014, to 33 percent.

As the services sector expanded in the 1980s, it attracted labor from agriculture until the share of labor in the services sector exceeded that of the agriculture in 1996. Its share has continued to increase at 48.2 percent in 2000s and currently averaging at 52.6 percent for the period of 2010-2014. While the industry sector, which includes manufacturing, has a substantial share in output, it has the lowest share in employment and the shares remained invariable for the past three decades at 15 percent.

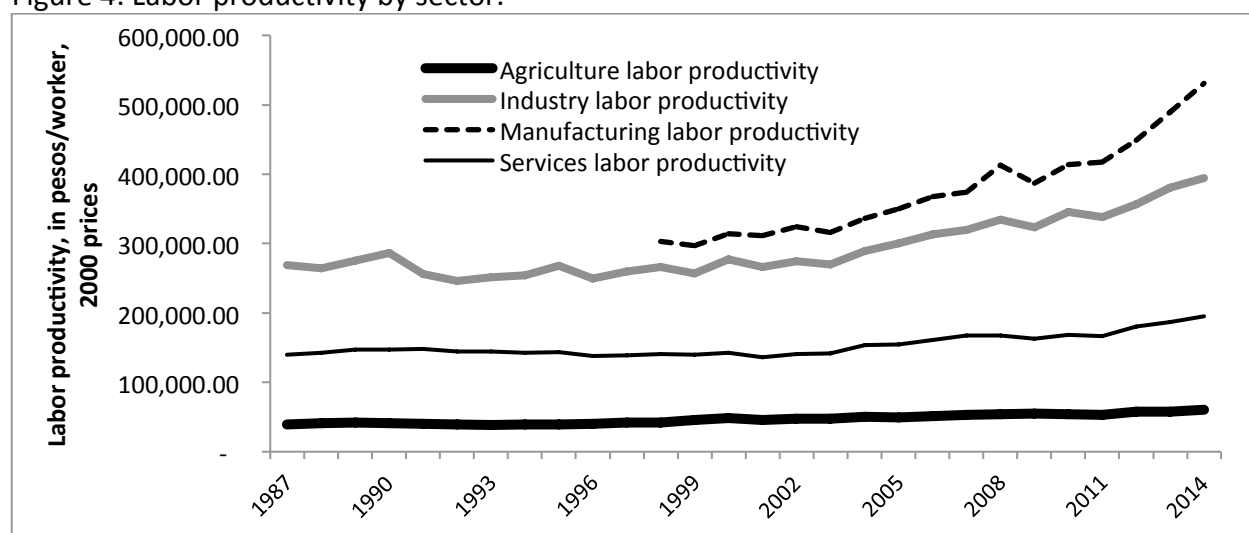
Figure 3. Composition of total employment by sector, 2000-2014.



Source: PSA Labor Force Survey, October round. Note: the data for 2014 excludes Leyte due to the onset of Typhoon Yolanda.

As discussed in the preceding section, growth in agriculture is required to stimulate growth in the industrial sector. High quality employment is generated in the industry; better quality jobs even for unskilled is associated with manufacturing. The country's development experience had been perverse, where employment moves out of low-productivity agriculture sector to an equally low-productivity service sector. Figure 4 shows that labor productivity in agriculture is the lowest among the sectors and has stagnated. The stagnation is also apparent in the services sector, although productivity there began to pick up a bit in recent years. In contrast, labor productivity in the industry, including manufacturing, exhibited growth, especially in recent years.

Figure 4: Labor productivity by sector.



Source of basic data: PSA.

By class, the percentage of wage and salary earners has been increasing since 2000 and has a share of 27 percent for the period of 2009-2011. On the other hand, the proportion of “unpaid” agricultural workers to total agricultural employment has been on the decline and is about one-fourth in the most recent years. This is an indication that quality employment in the sector has been increasing although not quite rapidly since about half of total agricultural employment was composed of self-employed agricultural workers.

The male-to-female ratio of agricultural workers was stable at 3:1. About two-thirds of those employed in the sector were below 45 years old. The share of workers below 25 years has been relatively stable during the last decade. However, it should be noted that this age bracket occupies about half of the share in the 1980s and 1990s (Ravago and Cruz 2004). The decline in the share during the most recent decade implies the shift in the unattractiveness of agriculture to the younger generation.

Table 1. Distribution of agricultural workers by various dimensions.

	2001	2004	2007	2010	2012	2014
Area (%)						
Urban	16.42	15.74	15.36	15.21	14.73	14.92
Rural	83.58	84.26	84.64	84.79	85.27	85.08
Class of Worker (%)*						
Wage and salary earners	22.72	24.99	23.23	27.00	31.93	30.91
Own account/self-emp	47.21	48.7	50.63	47.55	45.92	45.9
Unpaid family workers	30.07	26.31	26.14	25.45	22.15	23.19
Sex (%)						
Male	74.27	75.18	74.58	74.48	74.91	74.16
Female	25.73	24.82	25.42	25.52	25.09	25.84
Age (employed in rural sector) (%)						
15-19	10.99	10.66	10.98	10.31	10.29	9.95
20-24	8.95	10.12	9.09	9.03	9.18	9.01
25-34	16.09	20.76	21.39	19.42	21.56	20.94
35-44	20.22	20.34	20.59	21.15	20.09	21.02
45-54	17.15	15.83	16.84	18.18	17.26	17.46
55-64	12.17	10.33	10.69	11.62	11.56	11.53
65 and over	7.23	6.28	6.47	6.74	6.51	6.38
Agricultural workers (in '000)	10,426	10,159	12,497	12,515	12,373	12,502

Source: Labor Force Survey, PSA (various years, October round). *Excludes observations whose class was not reported. 2012 data is from July round. 2014 figure excludes Leyte due to typhoon Yolanda.

Creating opportunities for productive employment is critical to the country’s sustained economic growth and poverty reduction goals. At the turn of the 21st century, about 32 million Filipinos were in the workforce (Table 2). This pool is about 70 percent of the economically active population (or those 15-64 years old). Of the 32 million Filipinos who are able to work, only 28 million have work in 2000s; the remaining are either unemployed or underemployed. In 2012-2014, the pool of workers expanded to 41 million; there were 38 million employed and

2.9 million unemployed Filipinos. The Philippine Statistical Authority defines “unemployed” as persons in the labor force who did not work or had no job/business during the reference period and were reportedly looking for work. “Underemployed” are employed persons who expressed the desire to have additional hours of work in their present job or in an additional job or to have a new job with longer work hours.

In terms of growth, labor force has expanded in the 1990s until 2000s but growth decelerated in the succeeding periods. Growth in employment follows a more fluctuating trend. Unemployment rate has gone down from a high of 10.7 percent in 2000 to 7.1 percent in 2013, but underemployment remains high at about 20 percent during this period.

Table 2. Trends in labor force, employed, underemployed, and unemployed

	Levels in '000, rates in %							
	1990	1995	2000	2005	2010	2012	2013	2014
Labor force	24,665	28,589	31,493	35,537	38,930	40,426	41,022	40,050
Growth rate	3.0	3.4	3.4	0.9	2.8	1.0	1.5	2.5
Number of employed	22,345	25,965	28,117	32,187	36,096	37,600	38,118	37,310
Growth rate	2.6	3.7	3.1	2.1	3.0	1.1	1.4	2.8
Employment rate	90.6	90.8	89.3	90.8	92.7	93	92.9	92.8
Unemployment rate	9.4	9.2	10.7	7.8	7.3	7.0	7.1	6.8
Underemployment rate	22.7	20.8	20.3	20.4	19.1	20.0	19.3	18.4

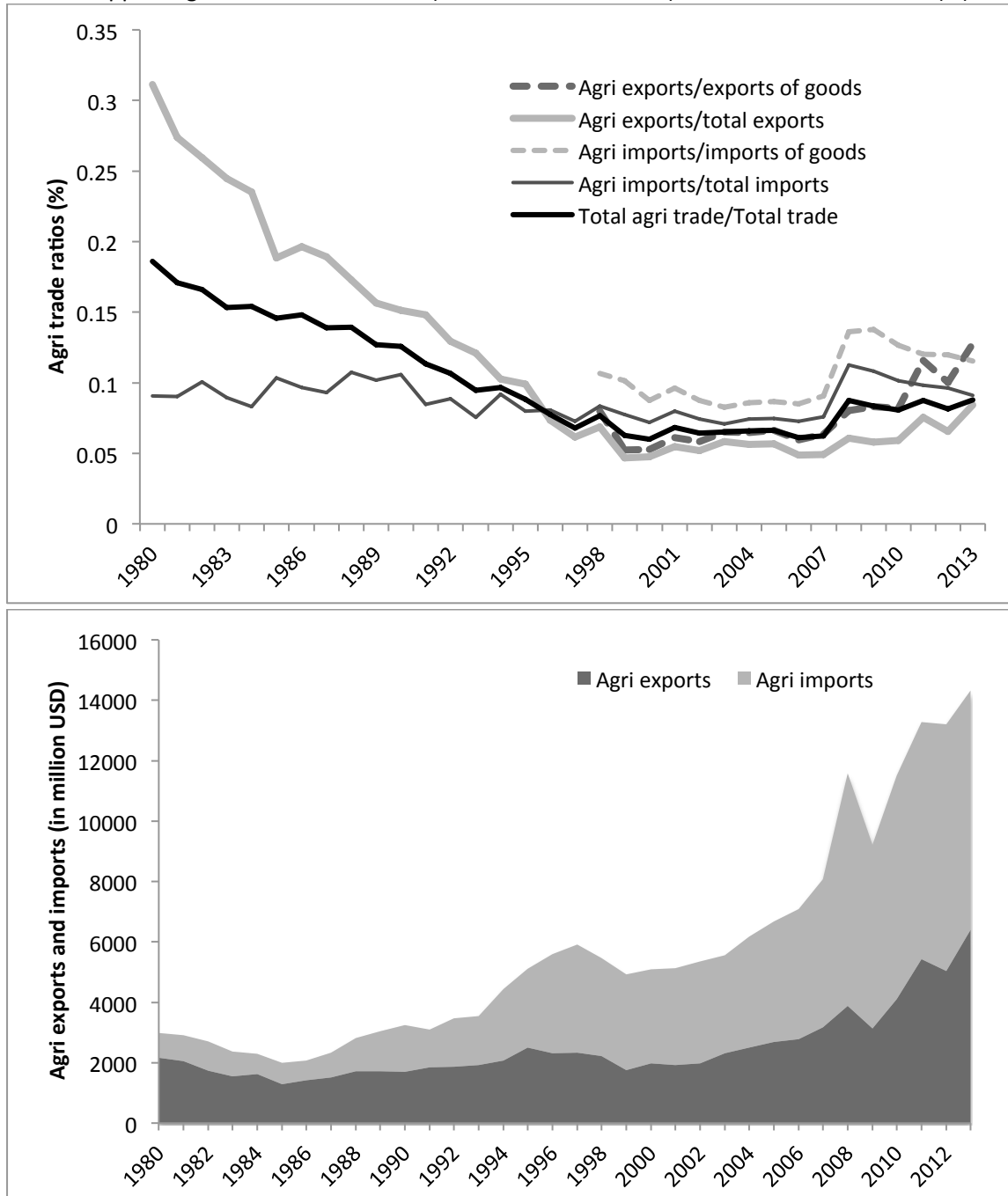
Source: PSA Labor Force Survey, annual averages. Note: Data are 3-year averages centered at year shown. The unemployment rate for 2005 refers to year 2005 only, because of the change in definition of unemployment in that year.

c. Structural transformation in trade

The structural transformation in trade also follows the development patterns in output and employment. The importance of Philippine trade in agriculture, in terms of its share in aggregate trade, has been on the decline since the 1980s (Figure 5 upper panel). The average share in the 1980s, 1990s, and 2000s was at 15, 9, and 7 percent, respectively. The descent is mainly driven by the sharp decline of agricultural exports to total exports from 1980-2000. The trend in agricultural imports to total imports was in a series of troughs and ridges, it somehow moves within a stable band. For the period of 2008-2013, average annual share of agriculture trade to total has picked-up a bit, posting an annual average of 8 percent. The uptrend is again driven by agricultural exports; in particular the average share of agricultural exports to total exports of goods is at 10% for the same period.

In absolute terms, however, trade in agricultural products less than doubled from an annual average of US\$3.5 billion in the 1980-90s to US\$6.1 billion in 2000-2007. In 2008-2013, it posted an average of US\$11.7 billion (Figure 5, lower panel).

Figure 5. Philippine agricultural trade: value (US\$ million FOB value) and share to total trade (%)



Source: PSA-Bureau of Agricultural Statistics (BAS).

Within the sector, the relative share of export and import products has also changed over the years. Tables 3 and 4 show the value and volume of the top ten agricultural exports from 2000-2013, respectively. The country's major exports—including coconut oil, banana, sugar, pineapple, and tuna—accounted for 53 percent of the total agricultural export value in 2011-2013. Table 3 also shows the changing relative importance of each of the particular export

products in the composition of agricultural exports. Coconut oil remains to be the most valuable export product. Bananas share to total value of agricultural exports has been on the decline but is catching up again in the most recent years.

Table 3. Value (US\$ million, FOB value) of top exports in the Philippines, 2000-2013.

Item	2001	2005	2010	2012
Coconut oil	411 (21.01)	605 (16.02)	1,095 (25.44)	1,131 (20.60)
Bananas	299 (15.29)	364 (9.87)	378 (9.17)	676 (12.03)
Centrifugal sugar			143 (2.91)	237 (4.22)
Pineapple and products	155 (7.94)	201 (5.47)	282 (6.88)	391 (7.07)
Tuna	131 (6.67)	134 (3.23)	336 (8.43)	478 (8.49)
Dessicated coconut	77 (3.93)	122 (3.40)	195 (4.56)	222 (4.04)
Seaweed and carrageenan	76 (3.88)	78 (1.89)	155 (3.61)	208 (3.74)
Tobacco, manufactured			157 (3.71)	199 (3.55)
Fertilizer, manufactured	45 (2.30)	80 (1.88)	130 (3.06)	..
Milk and cream and products			136 (3.21)	..
Value of Total Agri. Exports	1,958 (100)	8,660 (100)	4,207 (100)	5,570 (100)

Source: PSA-BAS.

Note: 3 year moving average centered at shown year; “..” signifies product category no longer in top 10 for 2013. Figures in parentheses show share to total value of agricultural exports.

Table 4. Volume ('000 mt) of top exports in the Philippines, 2000-2013.

Item	2001	2005	2010	2012
Coconut oil	1,133	1,059	1,003	882
Bananas	1,628	2,042	1,767	2,523
Centrifugal sugar			253	359
Pineapple and products	458	583	490	673
Tuna	70	61	99	64
Dessicated coconut	87	123	111	70
Seaweed and carrageenan	45	35	35	34
Tobacco, manufactured			23	17
Fertilizer, manufactured	317	373	361	..
Milk and cream and products			33	..

Source: PSA-BAS. Note: 3 year moving average centered at shown years. “..” signifies product category no longer in top 10 for 2013.

Tables 5 and 6 show the value and volume of agricultural imports from 2000-2013, respectively. Wheat and meslin had the highest import value, followed by milk and cream products. Rice, the country's staple, ranked fourth, with its imports registering the biggest share to total agricultural imports in the period of 2004-2011. The trend in rice imports is closely linked with the food policy that the government administration has adopted.

Table 5. Value (US\$ mil, CIF value) of total agricultural imports in the Philippines.

Item	2001	2005	2010	2012
Wheat and meslin	409.89 (14.01)	430.48 (10.77)	773 (11.06)	933 (11.80)
Milk and cream and products	344.04 (11.82)	403.83 (10.21)	556 (7.76)	697 (8.84)
Soyabean oil/cake meal	197.26 (6.73)	352.52 (8.93)	456 (6.48)	660 (8.36)
Rice	147.21 (5.00)	442.68 (11.00)	1,025 (14.86)	375 (4.75)
Fertilizer, manufactured			253 (3.53)	311 (3.93)
Meat of bovine animals	85.19 (2.93)	118.84 (3.01)	191 (2.68)	231 (2.92)
Urea	69.80 (2.41)	102.67 (2.57)	196 (2.79)	221 (2.79)
Tobacco, manufactured	77.86 (2.69)	178.73 (2.57)	156 (2.27)	157 (1.99)
Coffee			109 (1.53)	175 (2.21)
Value of Total Agri. Imports	2,919.23 (100)	3,976.85 (100)	7,062 (100)	7,900 (100)

Source: PSA-BAS. Figures in parentheses show share to total value of agricultural exports. . Figures in parentheses show share to total value of agricultural exports.

Table 6. Volume ('000 mt) of top imports in the Philippines, 2000-2013

Item	2001	2005	2010	2012
Wheat and meslin	2,874.89	2,293.36	2,589	2,835
Milk and cream and products	251.87	274.65	273	284
Soyabean oil/cake meal	1,063.66	1,316.49	1,432	1,650
Rice	881.07	1,513.04	1,614	705
Fertilizer, manufactured			804	913
Meat of bovine animals	80.82	98.64	87	81
Urea	629.85	546.33	579	563
Tobacco, manufactured	23.30	64.88	46	54
Coffee			58	82

Source: PSA-BAS. Note: 3 year moving average centered at shown year, rankings based on 2013 statistics.

Table 7. Agricultural Trade of the Philippines with its Major Trading Partners, 2008-2013.

	2008	2009	2010	2011	2012	2013P
Philippines						
Exports	3889.30	3135.75	4101.09	5431.76	5037.94	6318.00
Imports	7684.74	6079.80	7399.79	7839.93	8168.33	7801.79
Australia						
Exports	42.00	31.09	35.65	52.32	48.03	48.87
Imports	278.80	261.73	260.98	564.21	719.66	338.61
Japan						
Exports	527.49	452.86	432.02	653.05	691.85	887.42
Imports	176.34	96.83	117.41	138.67	116.17	93.31
USA						
Exports	971.68	777.53	961.92	1454.27	1203.45	1422.39
Imports	1402.16	1069.04	1142.38	1655.15	1765.35	1747.54
ASEAN						
Exports	579.68	486.28	608.75	920.71	857.68	946.52
Imports	2795.98	1970.84	2863.46	2186.69	2206.89	1925.10
EU						
Exports	859.63	606.63	1017.05	1066.03	911.75	1072.00
Imports	518.37	486.93	587.96	607.94	631.93	695.28
Rest of the World						
Exports	908.82	781.36	1045.69	1285.39	1325.18	1940.80
Imports	2513.09	2194.87	2427.60	2687.26	2728.34	3001.96

Note: Export in FOB in Million US \$; Import in CIF Million US \$.

Source: PSA-BAS

The country's major agricultural trading partners include the US, Australia, Japan, the European Union (EU), and the ASEAN member countries, particularly Indonesia, Singapore, Thailand, Malaysia, and Brunei (Table 7). In 2008-2013, a substantial share of Philippine agricultural exports (24 percent) and imports (19 percent) went to and came from the US. On the other hand, 13 percent of agricultural exports went to Japan. Trade with the ASEAN member countries has also been significant. In 2008-2013, agricultural export to our neighbors posted at 16 percent and imports registered at 31 percent. As in the last 10 years, the Philippines generated surpluses from trading agricultural products with Japan and the EU

3. Sources of agricultural growth

3.1. Output Growth

Table 8 shows the growth rate of gross value added of agriculture. The growth rates are reflective of the structural transformation within the agriculture sector. The major growth drivers are livestock and poultry, fishery, and crops subsectors, registering a growth of 4.1 percent, 4.4 percent and 4.3 percent, respectively in 2000-05. The growth has proven to be short-lived as all sub-sectors decelerated in 2005-10 owing to weather disturbances notably Typhoon Ketsana in 2009.

Overall, the performance of the sector has been volatile and erratic in the most recent years as the livestock and fishery sub-sectors grew at 4.5 percent and 5.6 percent respectively in 2010 and 2012. The forestry subsector reversed its growth trend, contributing positively, albeit small, to the overall growth of the sector. However, its relative importance has since declined occupying less than 1 percent share to total agricultural gross value added (GVA).

Table 8. Growth rates (%) of gross value added of agriculture by commodity, (2000 prices).

	2000 - 2005	2005 - 2010	2010 - 2012
Total	4.3 (100)	0.2 (100)	2.0 (100)
Livestock and Poultry	4.1 (22.08)	1.7 (21.45)	4.5 (23.60)
Fishery	4.4 (15.08)	3.4 (16.01)	5.6 (18.01)
Crops	4.3 (57.73)	-2.1 (56.47)	-0.9 (50.96)
Forestry	3.0 (0.46)	-10.8 (0.44)	30.2 (0.44)

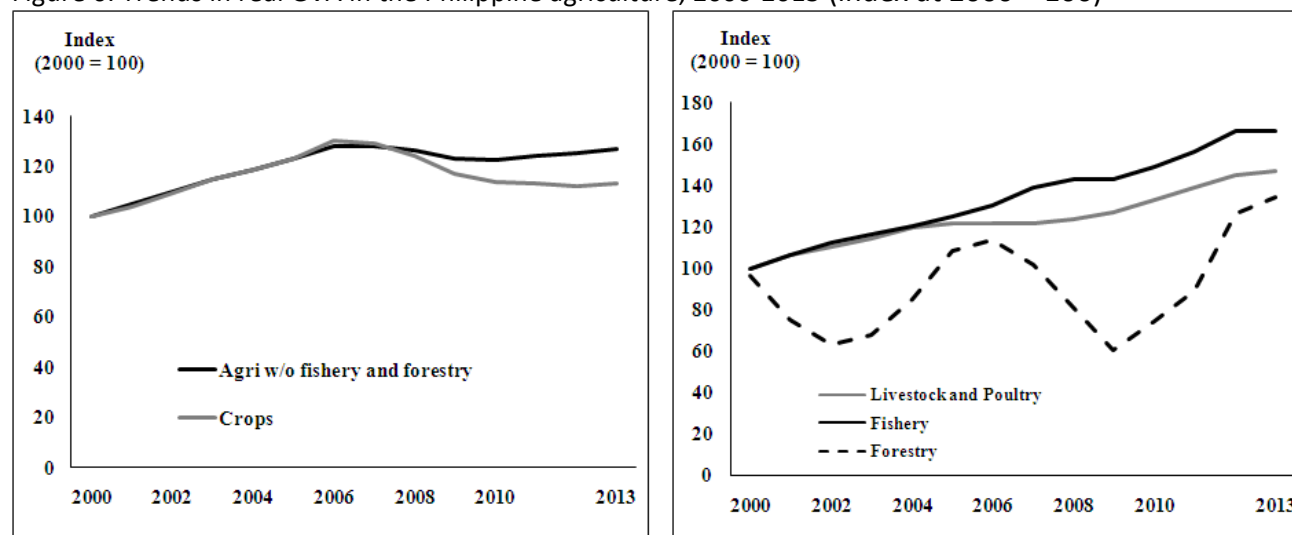
Source of basic data: PSA. Note: Figures in parentheses are average shares to total GVA. Residual corresponds to "Agricultural Activities and Services".

In terms of sectoral share, crops continued to dominate about half of total agriculture (Table 8, figures in parenthesis). The performance of the fishery sector has been relatively

stable and its share in total agriculture GVA has increased from 15 percent in the early years of 2000 to 18 percent in the last two years. On the other hand, the share of forestry in the gross value added is minuscule at less than 1 percent.

Figure 6 shows the trend of GVA in real terms. The movement of the crop subsector is a microcosm of the development of the agriculture sector. Crops subsector declined in 2008 and is now showing a plateau. Fishery, livestock, and poultry exhibit an increasing trend since the turn of the new century. On the other hand, forestry subsector has been volatile with its highs and troughs over the years. The following sections look at the major subsectors in greater details.

Figure 6. Trends in real GVA in the Philippine agriculture, 2000-2013 (index at 2000 = 100)



Source of basic data: PSA-BAS.

a. Crops

While crop production had the largest share in total agricultural output, it had one of the slowest growth rates in the 80s and the 90s. It posted a negative growth starting 2005 (Table 9). One reason for this was the slowdown in expansion of arable land from about 3.6 percent per year to 0.8 percent in the 1980s and early 1990s. Adding to the deceleration of crop production, especially in the 1980s, were the decline in world commodity prices affecting the country's traditional export crops (e.g., sugar and coconut); the series of natural calamities and droughts; and, for rice, the virtual completion of the Green Revolution.

Examining the various crops constituting this growth trend reveals that the major crops, palay (unmilled rice grain) and corn, did fairly well. In 2005-10, the negative growth was driven by the slump in sugarcane and other crops, which together constitute less than 40 percent share of the total crops. In the same period, banana had overtaken the growth of palay at a period average of 11.2 percent, largely due to improved farm practices. However, its growth hit an all-time low in the last two years owing to some external factors, such as pest infestation.

The deep troughs posted by banana and coconut drove the overall negative growth of the crops sub-sector.

Table 9. Growth rates of gross value added by crops, (2000 prices).

	2000 – 05	2005 - 10	2010 - 12
Total crops	4.34 (100)	-2.14 (100)	-0.87 (100)
Palay	4.06 (27.33)	6.21 (32.42)	1.73 (39.14)
Corn	6.44 (8.45)	3.40 (9.98)	1.37 (11.16)
Coconut	10.21 (7.92)	4.65 (10.13)	-11.40 (9.90)
Sugarcane	1.18 (4.89)	-3.98 (4.40)	3.54 (4.75)
Banana	8.35 (6.45)	11.32 (9.90)	-13.18 (11.21)
Other crops	2.93 (45.49)	-16.42 (33.15)	3.72 (23.84)

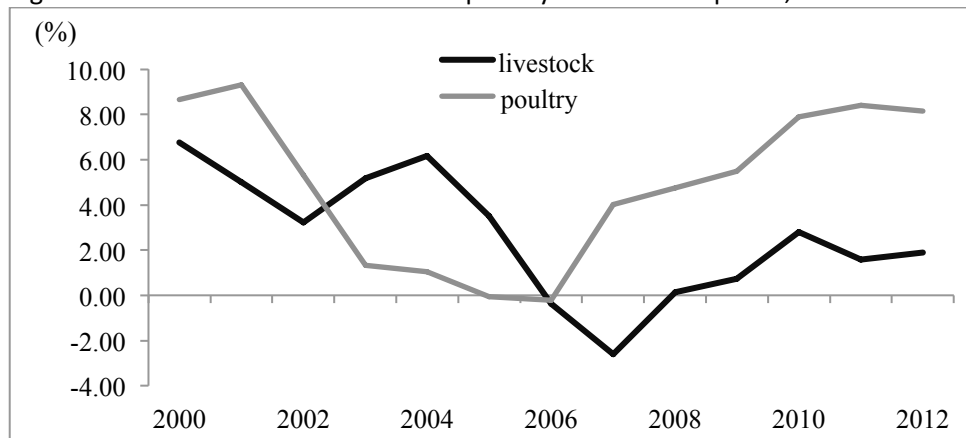
Source of basic data: PSA-BAS.

Note: Figures in parentheses are percentage share computed as the average share in the interval years

b. Livestock and poultry

The contribution of livestock and poultry to total agriculture GVA jumped to 23 percent at the turn of the new millennium coming from 18 percent in the 1970s. However, the growth has been erratic, decelerating during the first half of the decade and recovering only after 2006 (Figure 7). The downtrend in the growth of livestock and poultry was attributed to the decrease in the production of hog, carabao, and cattle during the first three years of 2000s. Nevertheless, growth of the poultry subsector was relatively faster, reaching about 8 percent during the last two years. While the livestock sub-sector declined sharply in 2007, posting a negative growth of 2.61 percent, its production rebounded in the succeeding years. The recovery owed to the increasing domestic demand, advances in production technology (e.g., shorter fattening/growing-to-market days), and incentives enjoyed by large commercial producers (e.g., duty-free importation of grandparents/parents of poultry stocks).

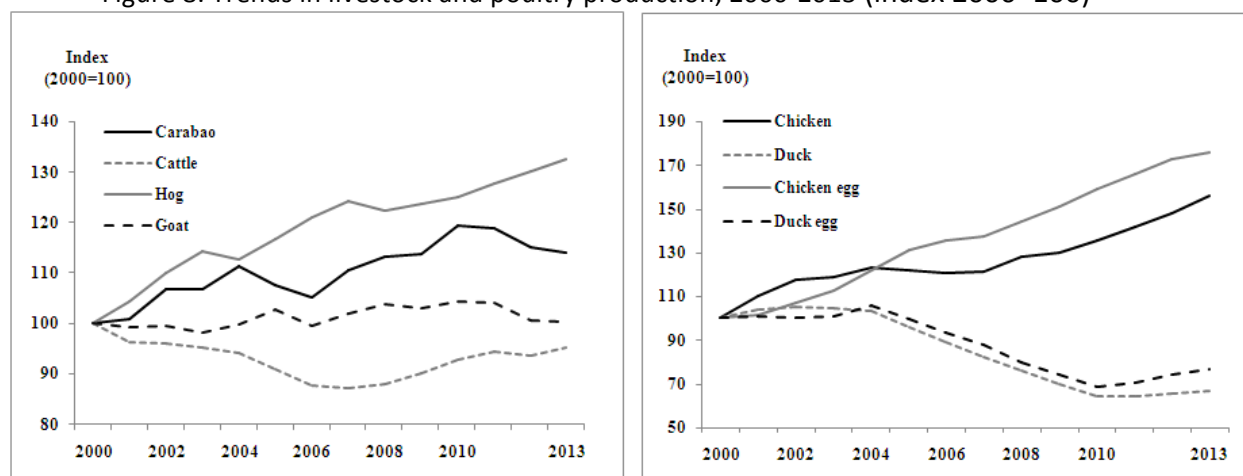
Figure 7: Growth rate of livestock and poultry GVA at 2000 prices, 2000-2012.



Source of basic data: PSA- BAS.

The hog and the carabao industries have contributed substantially to the strong performance of the livestock sector as production continuously increased in real terms (Figure 8). Hog dominated the sub-sector in terms of volume, with more than three-fourths share in total livestock production. Carabao production has increased in production by half from its 1990 levels. The government intensified livestock dispersal output in the late 1990s, which contributed to its increased production. Goat maintained its popularity as a poor man's cow, with a relatively stable production at 75,000 metric tons (mt) during the last decade. Production of cattle, on the other hand, tapered down owing to widespread incidence of diseases like foot-and-mouth disease.

Figure 8. Trends in livestock and poultry production, 2000-2013 (index 2000=100)



Source of basic data: PSA-Bureau of Agricultural Statistics

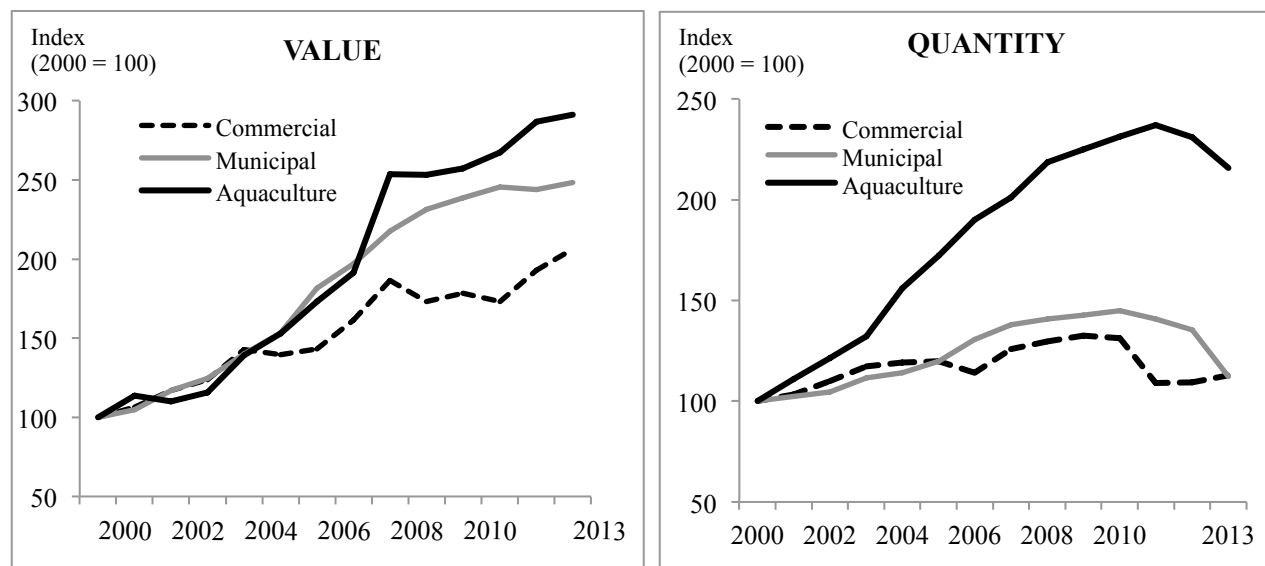
In the poultry sector, chicken and chicken eggs are major contributors to GVA. The economic difficulties of the 1980s prompted consumers to switch from the higher-priced pork and beef to chicken and carabeef and the preference have switched to date. It is worth noting that chicken production accelerated faster than the others despite the avian flu scare in Southeast Asia in 2004. This is partly because of the country's efforts to contain the avian influenza virus. On the other hand, a downward trend for ducks and duck eggs has been observed at the turn of the new millennium.

c. Fishery

The Philippines being an archipelago has fishing is one of the most important income- and employment-generating activities in the country, especially in the coastal areas. It is worth noting that the sector turned around its downtrend performance in the 1990s and arrested the rapid depletion of marine and aquatic resources, as well as increasing environmental degradation. However, overfishing, destructive fishing, encroachment of commercial fishing vessels in municipal fishing grounds, massive degradation of mangroves, and pollution of major rivers and lakes continue to constrain the sector (David 2003). Nonetheless, the future looks promising for the sector as it grew at an average rate of 5.6 percent in the last two years.

Among the three subsectors in fisheries, aquaculture occupies the largest share in quantity at 46 percent, whereas municipal and commercial have 28 percent and 26 percent shares, respectively. Aquaculture production accelerated sharply after 2000 in real terms (Figure 9) coming from a slow growth in the latter half of the 1990s due to scarcity of milkfish fries, disease problems in prawn culture, and red tide episodes in mariculture. Municipal fishing became relatively important, exhibiting an uptrend in output and value in real terms (Figure 9). Meanwhile, commercial fishing displayed steady growth due to higher catches of tuna for export (David 2003). In terms of value, the trend in fishery output looks more positive owing to high prices of fish products.

Figure 9. Trends in fishery production by subsector, 2000-2013 (Index 2000=100)

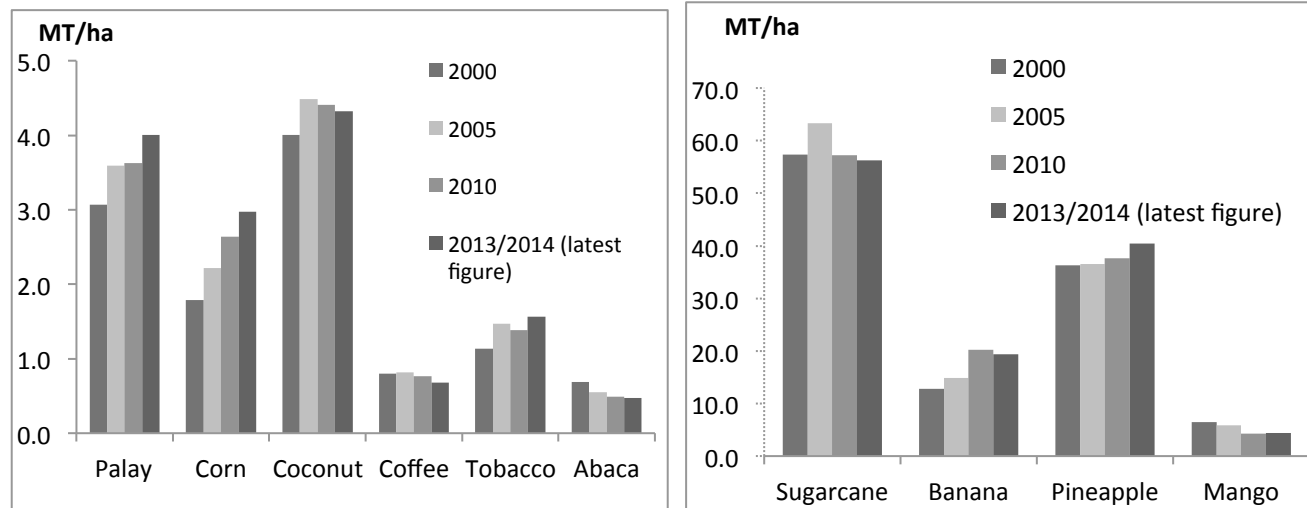


Source of basic data: PSA-BAS.

3.2. Productivity Growth

Improvement in productivity is key to the profitability and growth of an economic activity. In the long run, especially given land constraint and population pressure, the single most important driver of production growth is improvement in production efficiency, i.e., productivity growth. Yield, defined as output per unit of land, is a commonly used indicator of agricultural productivity, albeit partial since it accounts only for land as an input. Given this indicator, palay and corn productivity has been rising, while those for other crops stagnated (Figure 10).

Figure 10. Land productivity (mt/ha) of selected crops in the Philippines, 2000-2013/2014.



Source: PSA-BAS. Data are 3-year averages centered at year shown.

Productivity in sugarcane and pineapple did not change much, with sugarcane marginally decreasing and pineapple slightly increasing. Banana was the biggest mover from its initial productivity in 2000. Land productivity of mango, on the other hand, decreased from 2000 to 2014. Palay, corn, coconut, and tobacco had significant increases from 2000 to 2014, while abaca and coffee productivity has decreased from 2000 to 2014.

A comprehensive indicator of productivity growth is total factor productivity (TFP), which takes into account the growth of *all* inputs used in production of the commodity. Teruel and Dumagan (2014) have estimated the country's agriculture TFP growth using the superlative index number procedure. Using this framework, growth in revenues is decomposed into growth contributions of prices, quantities, and TFP. All components are derived from the available data except for TFP growth, which is computed as a residual.

Table 10 presents their estimates of TFP growth for the period of 1975-2004. The agriculture TFP growth was highest in 1975-1979 at 6.22 percent. The growth mainly came from the preceding Green Revolution. However, TFP growth was not sustained and even plummeted to a negative territory in the period of 1985-1989. At the turn of the century, the growth in TFP has started to pick up, posting an average of 3.6 percent.

Table 10. Total factor productivity and contributions to growth of revenues, 1975-2004.

Parameter	1975-1979	1980-1984	1985-1989	1990-1994	1995-1999	2000-2004
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
Coconut	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
Fruits	-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						
Seeds	0.01	-0.01	0.01	0.00	0.04	0.01
Fertilizers	0.17	-0.29	0.68	0.12	0.22	0.07
Animal labor	0.01	0.36	-0.21	-0.12	0.28	0.15
Machine	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
Labor	0.90	0.64	0.54	0.62	0.13	-0.29

Source: Teruel and Dumagan (2014).

4. Food and consumption patterns

As noted in Section 2, the share of food in total household consumption expenditure tends to fall with increases in per capita income. This pattern has been found to be quite robust in both cross-section and time-series household data, as well as nationally (households within a country, even for a relatively closed economy) and globally (households across national borders). In examining the driving forces behind this stylized pattern of development, Anderson (1986) identifies the fundamental role of household preferences, i.e., the universally increasing preference for non-food relative to food as per capita income increases. Put differently, the demand for food tends to be less income-elastic than the demand for non-food goods and services (including leisure). But even within the food group, there is typically substantial variation in the responses of household demand to income changes. Staples (such as rice in the Philippines and many countries of Asia and Africa), for example, tend to be less income-elastic than meats and fruits. In fact, the income elasticity of demand for staples tends to fall with increases in per capita income, becoming inferior goods (negative income elasticity) at some point in the development process (see Huang et al. 2010 for the case of China).

The food consumption patterns in the Philippines appear not to conform well to the stylized patterns, at least based on the recent data. At best, the evidence for cross-section and time-series data is quite mixed. Despite the increases in per capita GDP since 2000 (averaging about 3 percent a year), the share of food in total household spending has decreased only marginally after year 2000 and hovered at around 52 percent (Table 11). This “puzzling” observation extends to the food components. For example, rice expenditure, as a proportion of total expenditure, has tended to rise, not fall, during a period of relatively rapid income growth. On the other hand, expenditures for the generally income-elastic meat, dairy, and fruit products (Balisacan 1994) have unexpectedly either declined or remained flat. However, cross cross-section data based on the nationally representative Family Income and Expenditure (FIES) in 2012 shows that the “Engel curve” holds true for the Philippine households. Figure 11 shows a declining share of food in total consumption as per capita income increases.

What could explain this conundrum? At least two arguably fundamental factors are involved here. One is that the 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 (a very small proportion of the population) are very different from those of the poor and the near-poor (the overwhelming majority of the population), the trend in the *average* food consumption pattern for the population would not be expected to correlate well with overall income levels, as reflected by per capita GDP. Indeed, as indicated in the next section, the very sluggish reduction in absolute poverty in recent years could be reflective of the initially high—and rising—income inequality. This is, of course, consistent with the earlier observation that the food share—Engel value—has decreased only marginally during the period. Conceptually, the Engel value is a reasonable proximate of household welfare: rising food share indicates worsening household welfare (Deaton 1986).

Table 11. Food Expenditure Shares, 2000-2012 (%)

	2000	2003	2006	2009	2012
Share of food in total household expenditure	54.0%	52.4%	51.1%	52.23%	52.8%
Percentage to total food expenditure					
Share of food consumed at home	91.9%	90.7%	89.5%	88.9%	86.5%
Share of food consumed outside home	8.1%	9.3%	10.5%	11.1%	13.5%
Food category shares to total food expenditures					
Cereals (excluding rice)	9.7%	9.5%	8.5%	8.1%	8.8%
Rice	24.2%	22.1%	23.7%	25.7%	24.6%
Roots and tubers	1.7%	1.5%	1.3%	1.3%	2.0%
Fruits and vegetables	9.9%	9.9%	9.2%	8.9%	9.1%
Meat products	13.1%	13.3%	12.6%	11.8%	12.0%
Dairy products	6.1%	6.6%	6.4%	6.2%	6.1%
Fish products	13.9%	13.8%	13.2%	12.8%	13.3%
Coffee, cocoa and tea	2.4%	2.5%	2.7%	2.6%	3.3%
Non-alcoholic beverages	2.6%	2.8%	2.7%	2.8%	2.7%

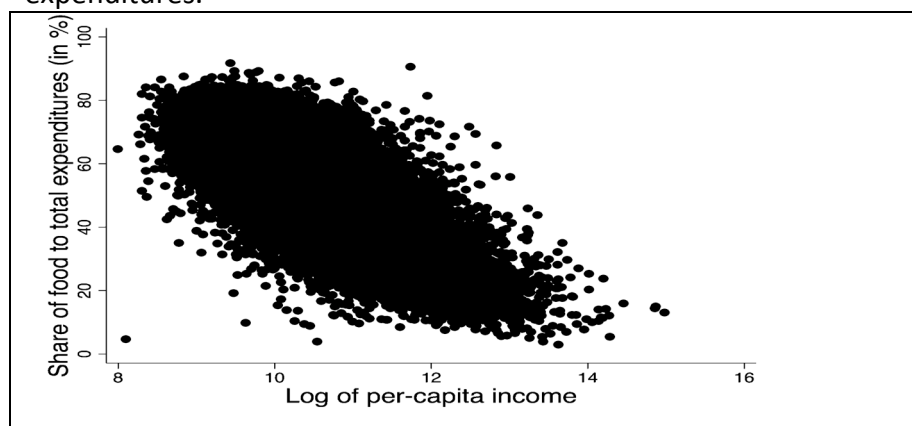
Sources: FIES, various years.

*For 2000, cereals include rice.

*For 2012, roots and tubers are the sum of spending on "vegetables cultivated for roots" and "potatoes and tubers".

*For 2012, a new product classification was used; this might account for kinks in the trends.

Figure 11. Engel Curve: Log of per-capita income vs. share of food to total household expenditures.

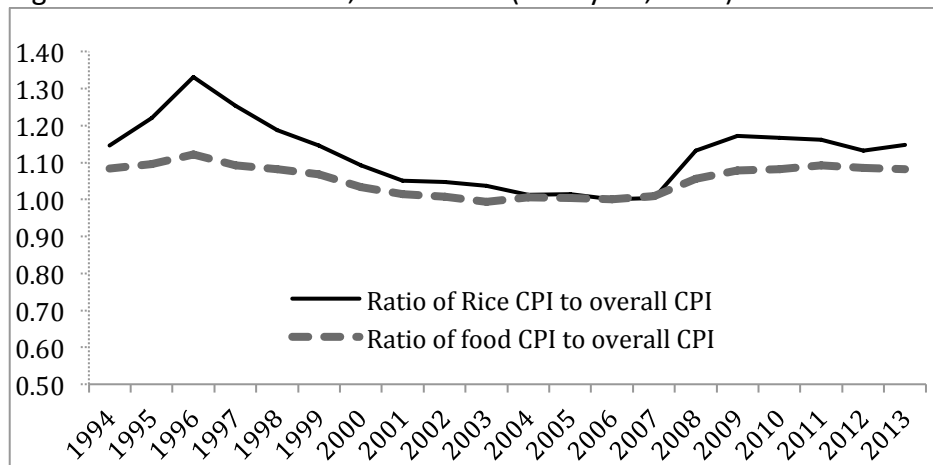


Source: FIES 2012.

The second factor 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 12). The movement in the CPI for the poorest 30 percent of the population shows an even sharper contrast (Figure 13). And even more so for rice, the country's staple, owing to trade policy distortions (see Section 6b, this chapter). Since the demand for staples (especially rice, which is, for the poor and the near-poor, the main source of energy) tends to be price-inelastic,

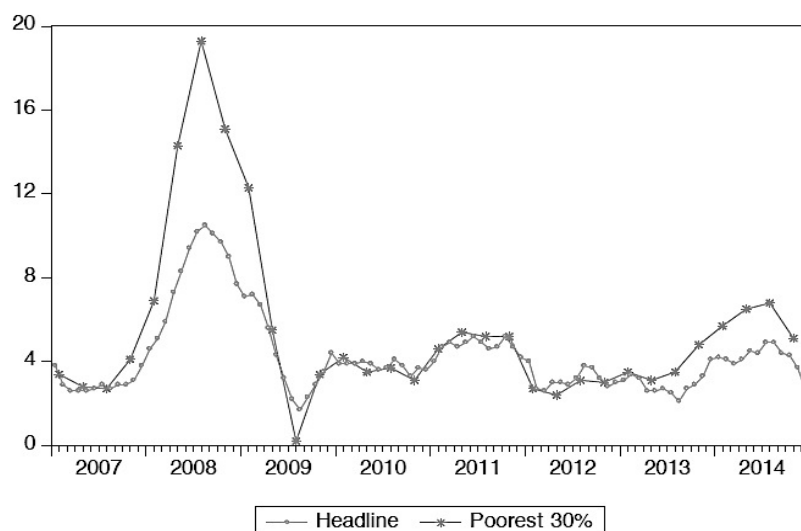
the expenditure on these consumer goods is likely to rise with price increases. This effect, in combination with the dismally low increases in income among the poor and near-poor (for reasons noted earlier), explains for the sluggish decline in food share.

Figure 12. Food CPI ratios, 1994-2013 (base year, 2006).



Source: CPI data from PSA. Ratios are from authors' calculations.

Figure 13. Headline Inflation Rate and Inflation Rate of the Poorest 30 Percent of Household



Source: Mapa et al. 2015.

5. Agriculture and poverty

a. Poverty trend

The rural sector constitutes half of the total population (Table 12) and continues to account for about two-thirds of the total number of poor people. The overwhelming majority of the poor are in agriculture. This indicates that poverty in the Philippines, as in many other

developing countries, is still largely a rural phenomenon despite rapid urbanization in recent years.

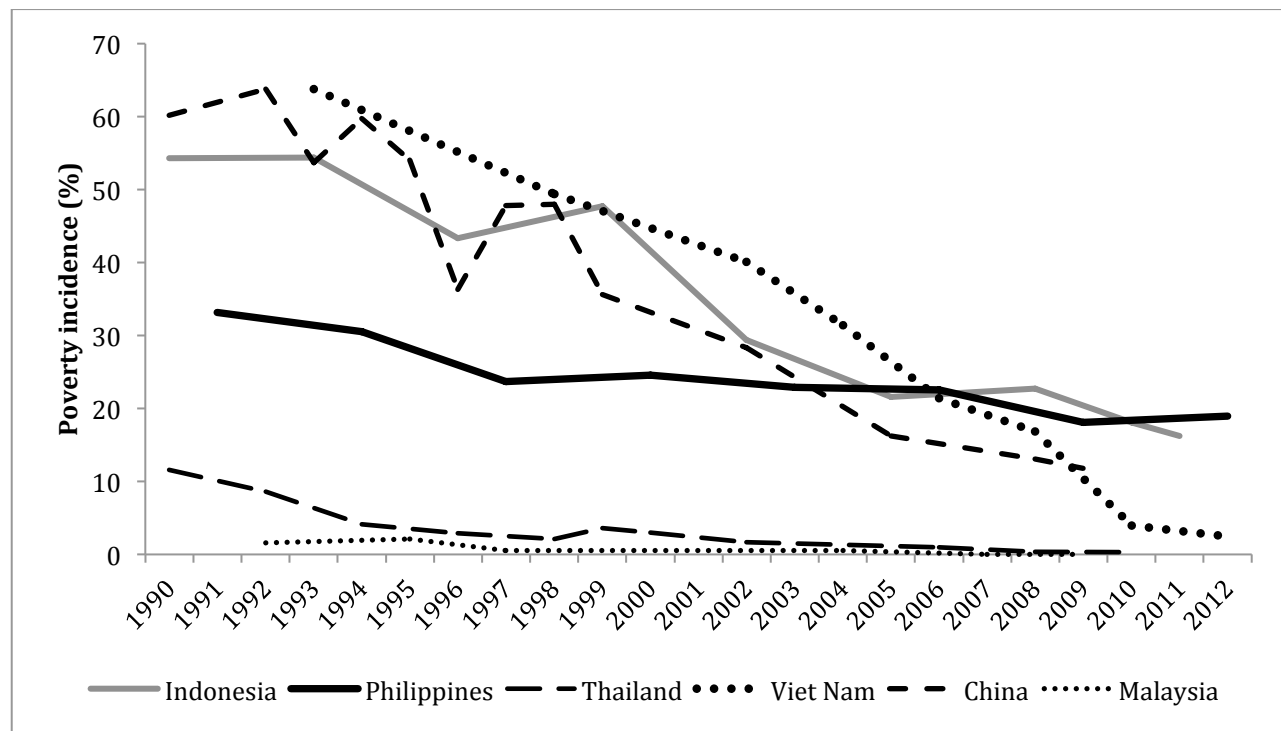
Table 12. Urban, rural, and agriculture population (%) of the Philippines, 2003, 2006, and 2009.

Population Share	Total		Agriculture	
	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

Source: FIES, PSA.

The country's incidence of absolute poverty in the early 1990s was much lower than those for China, Indonesia, and Vietnam. The country made virtually no progress in poverty reduction in the subsequent years, particularly in the first decade of the new millennium (Figure 14). Farmers in the major emerging ASEAN member countries of Vietnam, Indonesia, and Thailand have benefitted enormously from the modernization of supply chains, both local and global, and from the trade opportunities arising from the rapid expansion of agri-food markets in Asia. Together with sustained growth of employment opportunities in non-farm sectors of the economy, particularly in industry, this development in the agri-food markets has resulted in rapid reduction of poverty, particularly in rural areas. In Vietnam, Indonesia, and China, based on the World Bank's poverty line of US\$1.25 (in purchasing power parity) a day, the proportion of the population deemed "absolute poor" declined rapidly in the 1990s and in the first decade of the present millennium (Figure 14). Earlier, in the 1970s and 1980s, the same rapid decline was seen in Malaysia and Thailand.

Figure 14. Poverty reduction in select Asian countries, 1990-2012



Notes: Estimates refer to the proportion of population with income per capita below US\$1.25 a day (in PPP). Figures for Indonesia are approximations from urban/rural estimates.

Sources: World Bank- PovcalNet; Chen and Ravallion (2008) for China estimates; BadanPusatStatistik for urban and rural population ratios. Poverty line (PPP\$/mo)

The poverty trend in the Philippines is another story. The incidence of poverty in the country and across regions hardly decreased after the turn of the new millennium (Table 13). The decade saw the poverty situation in the Philippines to be quite unresponsive to the rapid growth of incomes and opportunities in the East and Southeast Asian region. The country's economic growth has been quite considerable in 2000s, averaging 4.7 percent a year, although not as dramatically high as its neighbors.

Table. 13. Poverty incidence (%) among population.

	1991	2006	2009	2012
PHILIPPINES	34.4	26.6	26.3	25.2
NCR	7.1	4.7	3.6	3.9
CAR	42.7	26.0	25.1	22.8
Region I	36.6	25.9	22.0	18.5
Region II	42.8	26.8	25.5	22.1
Region III	21.1	13.1	13.7	12.9
Region IV-A	22.7	10.3	11.9	10.9
Region IV-B	44.4	40.6	34.5	31.0
Region V	54.5	44.2	44.2	41.1
Region VI	39.6	29.1	30.8	29.1
Region VII	43.6	35.9	31.0	30.2
Region VIII	50.0	41.5	42.6	45.2
Region IX	40.3	45.0	45.8	40.1
Region X	46.6	39.0	40.1	39.5
Region XI	39.6	30.6	31.4	30.7
Region XII	53.3	37.9	38.3	44.7
Caraga	54.3	49.2	54.4	40.3
ARMM	30.5	47.1	47.4	55.8

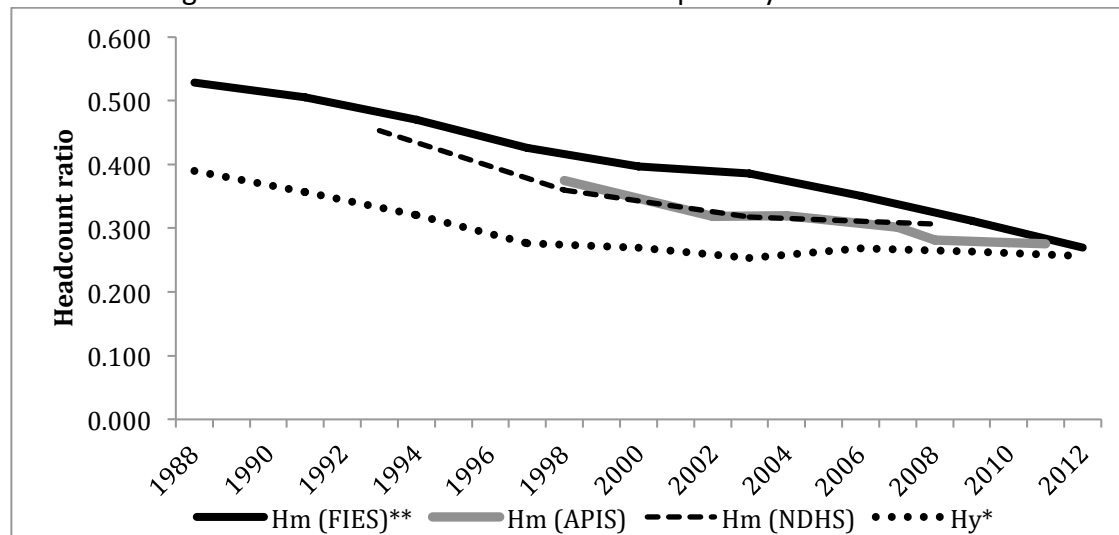
Source: PSA-NSCB.

Note: PSA-NSCB's estimation methodology in 1991 is not the same as the other years shown above. PSA-NSCB introduced a major revision in 2003 using provincial prices to allow for the estimation of provincial poverty statistics, see NSCB Resolution No. 1, Series of 2003

(http://www.nscb.gov.ph/announce/ForTheRecord/24Aug2007_Social_watch.asp). However, the national estimate for poverty incidence in 1991 is still used as the basis of the country's Millennium Development Goal (MDG) poverty reduction target.

Why the growth did not translate to absolute poverty reduction is a puzzle, although recent research has been looking into this conundrum (Balisacan 2015, 2007; Fuwa, Balisacan, and Bresciani 2015). Beyond income, one sees an improvement in the trend of poverty reduction in other areas of human deprivation. Balisacan (2015) estimated the trends of multidimensional-headcount (H_m) and the official income-headcount (H_y) as shown in Figure 15. All three data sources, FIES, APIS, NDHS, tend to show continued reduction in multidimensional poverty. The annual rates of poverty reduction were 1.78% for FIES, 2.04% for APIS, and 2.17% for NDHS. A deceleration of poverty reduction in the 2000s is shown by all three sources of data. Figure 15 shows that the pattern of poverty is quite different when seen from the lens of the official income headcount. The latter tends to show that GDP growth since 1997 does not have significant impact on the level of poverty. The remarkable difference is apparent in both FIES- and APIS-based estimates of multidimensional poverty, which shows continued improvements in poverty reduction in the 2000s.

Figure 15. Multidimensional vs. income poverty headcount ratio



Source: Balisacan [2015]. *Uses official per-capita food poverty threshold for 2009. Note: FIES MPI from 2000 and beyond not strictly comparable to FIES MPI before 2000 due to different “assets” variable, owing in turn to changes in the FIES questionnaire over time.

b. Can agricultural growth still serve as engine of local poverty reduction?

Some strands of the literature point to the key policy and institutional issues that explain why the country fails to seize opportunities for growth and poverty reduction. This section reviews the empirical evidence on the connection between agricultural growth and rural welfare outcomes, especially those pertaining to employment generation, poverty reduction, and other aspects of human development. Drawing from the literature, the section also identifies the role that urbanization, infrastructure development, asset/income inequality, and local geo-physical characteristics play in shaping the “comparative advantage” of agricultural growth to drive local poverty reduction.

Around the world, particularly in East Asia, the relative importance of agriculture in national income, employment, and poverty reduction is rapidly declining. This is an empirical regularity referring to structural transformation discussed in Section I. Invariably, in the fast emerging economies of Asia, this structural transformation has also been accompanied by substantial poverty reduction.

China’s experience in the 1980s and 1990s (and even today) is illustrative of the poverty-reducing effects of structural transformation. Not only did the agriculture sector decline sharply in relative importance, the country also had very rapid poverty reduction, especially in agriculture and rural areas. About 600 million people were lifted out of poverty in the past three decades. The country was the single largest contributor to the global poverty reduction achieved in the last quarter century. Behind its success was the dynamic interplay of rapid agricultural production growth fuelled by productivity improvements, especially in the

food sector, and even more rapid non-agricultural income growth induced mainly by massive off-farm investments in industry and labor-intensive exports. This has tremendously transformed the sources of household incomes even among farming households. In the early 1980s, about 80 percent of the income of Chinese farm households came from agriculture. By late 2000s, only about 40 percent of household incomes were derived from the sector. (The same pattern, though at a slower rate, can be observed in the development experiences of Thailand, Vietnam, and Indonesia.

Poverty reduction has varied remarkably across the Philippine regions and provinces. Part of the variation has to do with the pace of local income growth, broadly suggesting, as in national and global contexts, that income growth is a necessary prerequisite for poverty reduction. But the source of growth matters to local poverty reduction. For the country's 73 provinces, poverty reduction tended to be the norm whenever non-agricultural income was growing faster than agricultural income (Table 14). This was true not only in urban areas but also in rural areas. However, this does not suggest that agricultural growth is, at this stage of the country's development, inconsequential to local poverty reduction. On the contrary, under certain conditions, agriculture matters and will continue to matter for poverty reduction. A number of provinces achieved poverty reduction in a regime where agricultural income grew faster than non-agricultural income. The response of poverty to sectoral growth, whether agricultural or non-agricultural, depends on a number of factors that could vary from one area to another.

Table 14. Growth of agricultural income vs. non-agricultural income

		Ag. vs. non-ag income growth rate during 1991-2006	
		$\Delta \text{ag income} > \Delta \text{non-ag income}$	$\Delta \text{ag income} < \Delta \text{non-ag income}$
$\Delta \text{poverty incidence during 91-06}$	Increase	3	8
	Decrease	4	58

Source: Fuwa, Balisacan, and Bresciani 2015.

An in-depth examination of the factors influencing the response (elasticity) of poverty reduction to income growth reveals that the factors operating for the agricultural sector are quite different from those for the non-agricultural sector (Table 15).

Table 15. Initial conditions affecting the sectoral growth elasticity of poverty reduction (provincial panel data, 1991-2006; fixed effects model) in the Philippines. Dependent variable = $\ln(\text{Provincial poverty}_{it})$

Variable	Coeff	Std Err
$\ln(\text{non-ag Y per capita})$	-1.670***	0.358
$\ln(\text{agriYper hectare})$	-0.230***	0.083
Time trend (year)	-0.010***	0.003
$\ln(\text{non-ag income})$ interacted w/ initial conditions of 1991		
OFW share	-0.501***	0.116
Malnutrition	6.309***	2.122
Road density	-0.372***	0.134
Income inequality	1.877**	0.846
$\ln(\text{ag income})$ interacted w/ initial conditions of 1991		
Irrigation potential	-0.674**	0.312
Rice yield	-0.289**	0.075
Constant	27.745***	6.324
Number of obs.	402	
R-squared	0.550	
F-test (all coefficients zero)	39.116	

Note: Other provincial fixed effects that are not statistically significant are not shown. These variables include local political characteristics, urban-rural disparity, and schooling of household head.

Source: Fuwa, Balisacan, and Bresciani 2015.

For the former, the elasticity tends to be higher in areas where agricultural productivity potential, based on geo-physical endowments, is high, and urbanization is relatively low. What this suggests is that agricultural development remains to have high potential as driver of poverty reduction in areas with high potential for agricultural productivity growth (e.g., high potential for irrigation development, such as relatively flat landscapes), as well as in relatively "more rural" (remote, less commercialized) areas. For example, Ilocos provinces, given their comparatively low asset, inequality, and location far away from industrializing or urbanizing centers, agriculture is still likely a key driver for their poverty reduction. As noted below, this will be even more so if the access of these provinces to national road network is much improved so that the sector is linked efficiently to major markets for farm produce, including exports.

For the non-agricultural sector, the response tends to be influenced by the initial levels of income (asset) inequality, human capital, and infrastructure development. High land inequality, such as in Negros provinces, weakens the capacity of non-farm income growth to serve as key driver to poverty reduction. High level of human capital favors non-farm development and this in turn favors faster poverty reduction. Rapidly developing areas tend to have good infrastructure, reducing transaction costs, and facilitating agglomeration economies.

The type of infrastructure development influences the response of poverty to income growth. In another study examining the impact of infrastructure on agricultural/non-agricultural income growth, Fuwa, Balisacan, and Bresciani (2015) find that investing in local roads is likely to facilitate rural non-farm growth, while investing in national roads is likely to reinforce agricultural growth by providing greater access to markets, including export markets, for agricultural produce. Thus, investing in national road networks does not appear likely to lead to rural industrialization, but rather to further agglomeration (urbanization), while investing in local road networks could facilitate rural-non farm sector development (and may well mitigate urban congestion).

6. Key policy and governance issues

What are the key constraints to growth and poverty reduction that need to be addressed so that the country can achieve inclusive development, thereby also joining the shared prosperity of its neighbors? In particular, what can be done by way of policy reform and public investment to alter the course of agricultural and rural development, thereby giving traction to poverty reduction as the economy stays on its high-growth trajectory?

a. Macro constraints: fiscal, monetary, exchange rate

One fundamental lesson of development in the past half-century is the overwhelming influence of macro-economic factors—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 favor of industry (and services) and against agriculture,

thereby prematurely drawing away resources from agriculture to non-agriculture sector of the economy. Specifically, unsustainable high fiscal deficits and high inflation that accompanied attempts to spur growth, combined with exchange-rate controls and protectionist policies for import-substituting industries, have led to overvaluation of the local currency, disproportionately hurting the highly-tradable agriculture sector, particularly export commodities. Moreover, the indirect effects of these policies on agricultural incentives have tended to overwhelmingly offset any favorable effects of direct policies and programs targeted for agriculture e.g., input subsidies, output price support, among others (Krueger et al. 1991, Anderson et al. 2008). The policy-induced suppression of agricultural incentives has meant lower income growth in agriculture, less dynamic structural transformation of the economy, and less poverty reduction despite economic opportunities arising from rapid growth of global trade, information and communication innovations, and the explosion of global value chains in food and agricultural markets (Reardon, Timmer, and Minten 2012; World Bank 2008; Reardon and Timmer 2007).

While generally the same pattern of incentives also prevailed in the Philippines (David, Intal and Balisacan 2009), the past decade has seen much benign macro-economic environment for agriculture (and for the economy as a whole). Unlike the previous episodes of growth in most of the postwar period, when every boom was soon followed by bust, the growth since the recovery from the global financial crisis has been supported by sound macro-economic fundamentals: declining debt burden, declining public sector deficit, low inflation and within government targets, consistently strong current-account positions, and improving public sector revenue. Outstanding public sector debt, as percent of GDP, has declined from about 101 percent in 2000-2002 to about 72 percent in 2011-2013. Interest payments, as percent of GDP, have declined from about 30 percent in 2006 to 17 percent in 2013. The national government borrowing program has increasingly shifted away from foreign to domestic sources (with the share of foreign borrowing reduced from 44 percent in 2009 to 11 percent in 2013), thereby reducing the country's exposure to external shocks. Though government revenue, expressed as a percent of GDP, has not recovered yet from its high points in 2006-2008 (about 15 percent), it has seen improvement in recent years, gradually rising from about 13 percent in 2010 to about 15 percent in 2013 and 2014. Together with more effective spending management, these developments have led to lower fiscal deficits, falling from about 3.5 percent of GDP in 2009 and 2010 to one percent in 2013 and 2014. Meanwhile, inflation has remained low and within the target range of 2 to 5 percent since 2009. The current account has likewise been consistently positive since the mid-2000s on the back of robust overseas-worker remittances, BPO and tourism receipts, and merchandise export earnings. This favorable external position has allowed the country to somehow withstand external shocks (e.g., recession in a major trading partner, global financial crisis, etc.), thereby preventing sharp swings in the exchange rate or in domestic interest rates, as what characterized the other decades after the Second World War.

The challenge, moving forward, is to sustain the reform momentum in the fiscal and financial fronts. Expanding the tax base and developing new revenue sources to further raise revenue efforts to at least the levels prevailing in the country's neighbors will be crucial to

fortifying the fiscal front and sustaining rapid growth. For one, massive infrastructure development in transport, power, information and communication, irrigation and drainage, and disaster risk reduction, is crucial to building a highly competitive and resilient economy, especially in view of the onset of ASEAN Economic Cooperation and the country's increasing integration in the global economy. For another, the strong investment in the social sector in recent years, particularly in health, education, and social protection has to be sustained to foster human development and shared prosperity. Improving access to finance for small and medium enterprises, especially in rural areas, has to be also part of the arsenal to achieve a more inclusive growth.

b. Food sufficiency policy: trade policy regime for food, price stabilization

The country's food policy, as indicated in various Philippine Development Plans, has multiple objectives-- achieve food security, increase incomes of small farmers, protect poor consumers from high prices, and raise productivity to enhance farming's contribution to economic growth and development. In practice, the policy is focused largely on rice and it involves buying palay (unmilled rice grain) from producers at high (above-market) prices and selling rice to consumers, especially in urban areas, at low (below-market) prices.

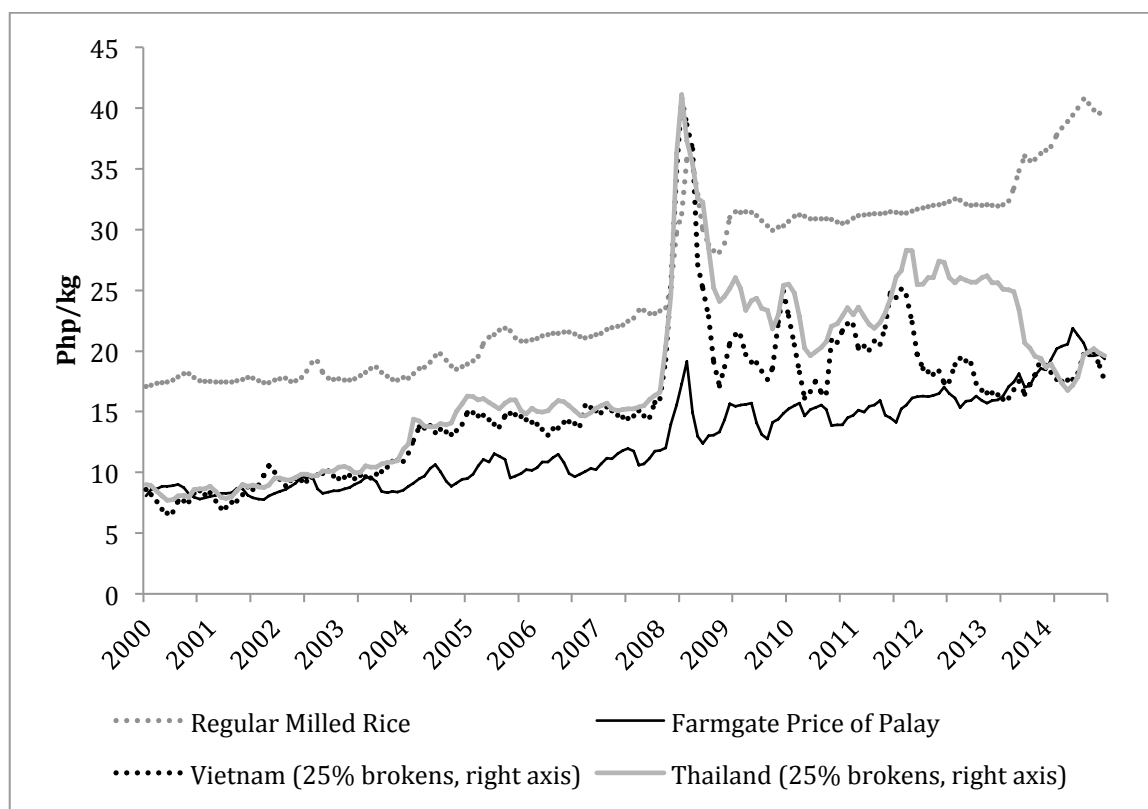
The other goal of the policy is to achieve national self-sufficiency in this staple. Implementing this policy is the National Food Authority (NFA), an attached agency of the Department of Agriculture. To implement the policy, NFA is empowered to monopolize rice importation or, if private sector is permitted to import, to implement a quantitative restriction (QR) regime for rice imports. NFA also regulates domestic rice trade and is provided subsidy outlay by the National Government for its "buy high, sell low" operations. The national self-sufficiency goal puts pressure on NFA to restrict the volume of imports, driving domestic rice prices above their comparable border prices. It is at this higher level of domestic prices that NFA uses as basis for its "sell low" prices for consumers.

The policy regime—near monopoly of NFA on rice trade, high import tariffs, and QR on rice—has resulted in inadequate supply and kept domestic prices artificially high above comparable world (border) prices, by 50 to 100 percent (World Bank 2015a). At these domestic prices, Filipinos pay more for their staples than their counterparts in Southeast Asian countries (see Figure 16). Moreover, Filipinos have not enjoyed the benefits of falling world rice prices in recent years, as domestic prices remained artificially high during this period (Figure 16). Even most rice farmers have not benefited from the NFA support price owing partly to poor targeting and partly to the fact that NFA procurement represents only a small part (typically less than 5 percent) of total rice production.

The high rice prices have effectively reduced the purchasing power of the incomes of Filipinos, particularly the poor whose rice expenditure accounts for about 20 percent of their total household expenditures. This means that the poor, in an attempt to meet their staple requirement, would have to cut down on other consumption such as education and health care. For the poor who cannot afford to buy more rice, malnutrition could set in. In recent

years, the Philippines has one of the highest incidence of malnutrition among countries with comparable levels of development (World Bank 2015b). Despite its comparatively remarkable economic growth in recent years, the country is also one of the very few countries in Asia that is failing to achieve the MDG on poverty by 2015.

Figure 16. Trends in Domestic and World Price of Rice



Source: World prices (Thailand, A1 Super, White rice broken, Bangkok, f.o.b., converted to pesos per kilogram) from FAO; Domestic retail (rice special, pesos per kilogram) and farm gate (Palay [Paddy] Fancy, dry conv. to 14% mc, pesos per kilogram) prices from PSA. Note: 2008 spike due to global rice crisis. World prices originally US dollars per tons, converted using BSP monthly exchange rates and 1 ton = 907.185 kg.

The ramification of high food prices on poverty is especially notable in 2013 and 2014. Largely because of NFA's posture to tightly restrict imports despite dwindling rice inventory, domestic rice prices rose sharply reaching as high as 15 percent in the second half of 2013. For the period between the first half of 2013 and the first half of 2014, inflation for the food basket of the poor (the food component of the poverty line used for poverty estimation) increased by 9.4 percent (see Figure 13 in Section 4, this chapter). In contrast, overall inflation for the period was only 4.3 percent. Based on the results of the Family Income and Expenditure Survey (FIES), the average *nominal* per capita income of the bottom (poorest) 30 percent of the population increased by 7.2 percent, while that for the top (richest) 20 percent increased by 4.5 percent. In the absence of the high food inflation (equivalently, if food inflation was only as high as overall inflation), the real income of the poor could have increased, and the *proportionate* increase

could have been more than that for the top 20 percent (i.e., growth could have been pro-poor or *inclusive*). Instead, for the bottom 30 percent, their real income fell, not increase. As a result, poverty incidence (the proportion of the population deemed poor), as officially calculated by the Philippine Statistics Authority, rose to 25.8 percent in the first half of 2014 from 24.6 percent in the first half of 2013, despite the fact that GDP growth rates for 2013 and 2014—at 7.2 percent and 6.1 percent, respectively—were remarkably high by global standards, even by those of the emerging economies of the world.

Evidently, the rice policy objective of self-sufficiency has not only remained unachieved, it has also come at a very high price to the other development objective of poverty reduction. The objective of “sell low to the poor” has also little consequence on their welfare because NFA rice accounts for only about 11% of their rice purchases (owing partly to high leakage of the subsidy to the non-poor). On the other hand, the “buy high from farmers” would also have little impact on poor farmers since total NFA purchases are too small (averaging only 7 percent of total production) and the high leakage of the price-support subsidy to large farmers and perhaps traders. In any case, the “buy high, sell low” policy cum QR on rice imports to achieve rice self-sufficiency has proven to be a costly way of providing income transfers to the poor and securing availability of rice at the national level. For every peso given to the poor, the government spent about two pesos (Roumasset 2000). And for every US\$ 1.00 that was saved for not importing rice, the country used domestic resources worth US\$ 2.60 to save that dollar by locally producing the rice.

Finally, the uncertainty faced by the private sector in the food market arising from NFA’s import operations (e.g., unexpected arrival of rice imports during harvest months) has discouraged private investments in storage and distribution facilities.

In the meantime, NFA accumulated a huge debt of over Php170 billion by 2010. Annually, the National Government provides budgetary outlay to NFA to partially cover the debt. This outlay usually represents the single largest item in the total government spending for agriculture (David, Intal and Balisacan 2009; Balisacan, Sombilla and Dikitanan 2010). The share of the rice sector in the total budget of the Department of Agriculture and related agencies (government-owned and/or controlled corporations) has, historically, been about 65 percent. This is high compared to its share (20 percent) of total agriculture gross value-added.

Moving forward, it is high time for a thorough reform of rice policy. The QR regime would need to be dismantled and replaced with tariffs, perhaps initially at the out-quota tariff rate of 35 percent but to be decreased gradually to align it with the operative tariffs for the other agricultural commodities. NFA would have to be oriented to managing buffer stocks for emergency purposes. The private sector would have to be assisted in building up efficient logistics, particularly in transport.

c. High transaction costs: transport infrastructure, connectivity, and regulatory environment

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 stem from two basic sources – the country's weak institutions, particularly regulatory, and the poor quality of infrastructure, especially transport. Comparison on ease of doing business between the Philippines and its East Asian region is instructive. Based on World Bank and IFC (2014), the country has a relatively poor business environment, as evidenced by its rank of 95 (50th percentile rank among respondent countries), in contrast with that of 26 (14th percentile) for Thailand, 18 (10th percentile) for Malaysia, 90 (46th percentile), 78 (41st percentile) for Vietnam, and 114 (60th percentile) for Indonesia.² Based on recent issues of the World Economic Forum's Global Competitiveness Report, the Philippines ranked in the bottom one-third of over 130 respondent countries, both in quality of institutions and quality of infrastructure. In contrast, the major East Asian countries, particularly China (a socialist country), Malaysia, and Thailand, ranked much higher. As noted above, all these countries have done well in poverty reduction. 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. Investors, domestic or foreign, see the Philippines from this lens.

For farmers, these inefficiencies would translate to high post-harvest losses, large differentials between retail (consumer) prices and farm-gate (producer) prices, i.e., transaction costs, and low access to income-enhancing opportunities toward diversification of farm household income. For example, due partly to poor infrastructure, farmers cannot connect efficiently to the supply and value chains, including export markets. Thus, they are missing the huge opportunities for income growth from the rapidly expanding markets for high-value crops in 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 communication (World Bank 2014a; Balisacan and Hill 2007). While public investment in infrastructure (as percent of GDP) has increased from about 1.5 percent in 2011 to about 3 percent in 2014 (and is targeted to rise further to 4 percent in 2015), the infrastructure deficits are huge and the current level of spending is still short of that in some of the country's neighbors. This poor infrastructure connectivity has created high transaction costs and lack of spatial integration in the country wherein the regions/provinces are segmented into two: 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).

² The cost of starting a business (percent of per capita income), for example, is substantially higher in the Philippines (17 percent) than in Malaysia (7 percent), Thailand (7 percent), China (1 percent), and Vietnam (5 percent). It would take, on average, 34 days to start a business in the Philippines, while the comparable figures for Thailand, Malaysia, and Vietnam are 28, 6, and 34 days, respectively (World Bank and IFC 2015).

In contrast, in situations where the provinces are efficiently connected, and where investment in human development, particularly health and education, is location-neutral, then even households in lagging provinces would benefit from the growth in leading provinces. That is, while concentration of production activities in certain regions, provinces, or centers is inevitable--and perhaps even desirable--owing possibly to high agglomeration (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 centers. (Balisacan, Hill, and Piza 2009; World Bank 2009a).

Given the fiscal space that it currently enjoys, the country has the opportunity to address the infrastructure bottlenecks and severe underinvestment in basic social services. Spending in transport infrastructure, in particular, should be brought at least up to the levels—about 6 to 8 percent of GDP--of the country's peers in emerging Asia. 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 partnership (PPP) should be further improved to make infrastructure projects attractive for the private sector.

d. Unequal access to basic social services

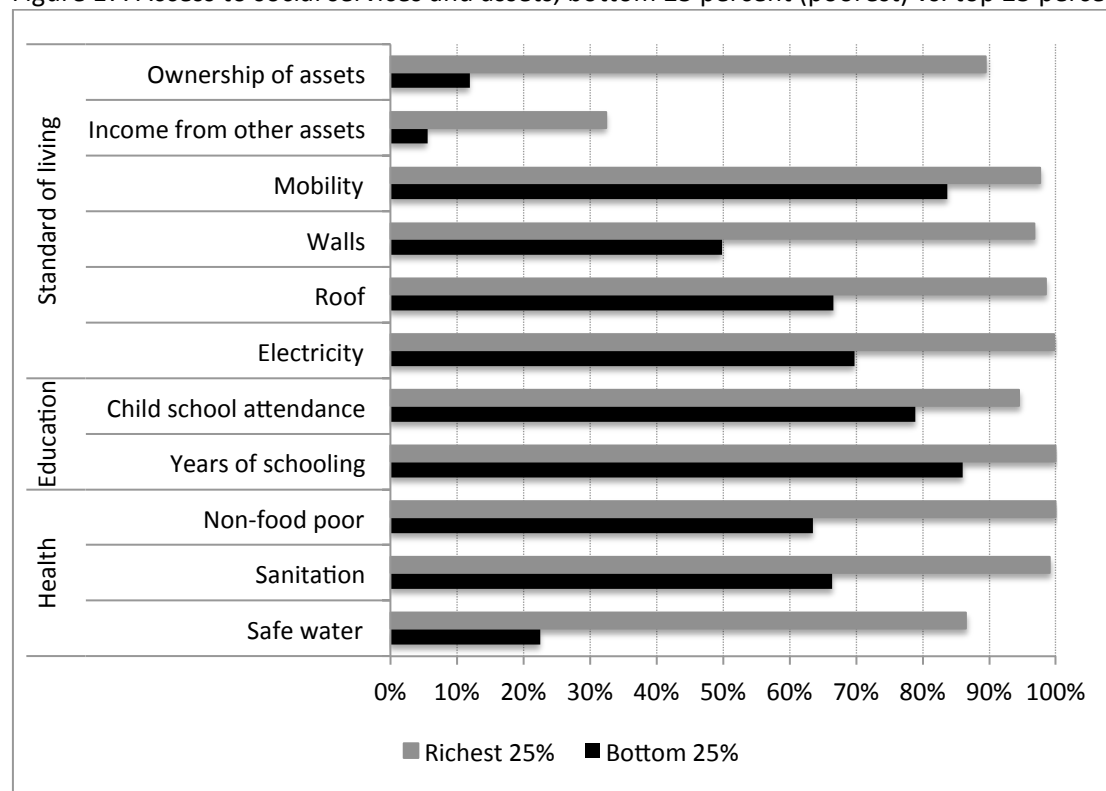
The quest for equalization of household welfare and opportunities in a setting where production activities are spatially concentrated highlights another key aspect of Philippine development pattern: the high inequity in access to social services and assets especially in education, health, and land. For one, there is a large gap in access to certain social services, for instance, as basic as clean water, between the bottom 25 percent and the top 25 percent of the population (see Figure 17).

To be sure, inequity in access to social services is ubiquitous in the developing world, even in Southeast Asian neighbors, particularly Indonesia, Thailand, and Vietnam where, as noted above, economic growth in recent decades has been accompanied by a near eradication of abject poverty. 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 very 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-fourths of the overall inequality in the distribution of welfare across households; inequality between these areas accounts for the remaining one-fourth of the overall inequality (Balisacan 2007).

As would be expected given connectivity inefficiency, 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 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 the rural settings in the Visayas.

Figure 17. Access to social services and assets, bottom 25 percent (poorest) vs. top 25 percent (richest)



Note: Estimates based on the 2012 FIES.

The government's direct response to these inequities has taken various forms, including asset reforms and cash transfers intended for the poor, the most recent of which is the *Pantawid Pamilya* Program (the country's version of the *Conditional Cash Transfer* Program that has gained currency in Latin America and many other developing countries of the world). However, in the past two decades, all but few of the major poverty-reduction programs have been either poorly designed or, if reasonably designed, badly implemented. As such, the programs have been grossly ineffective in achieving their goals and have become very costly from a fiscal viewpoint. The high leakage of the program benefits to the unintended groups could have actually contributed to the gnawing inequality. As compiled by the World Bank (2014) and Manasan (2009), among the programs with high leakage included the *Pantawid Kuryente* Program, which had a leakage rate of about 72 percent; DepEd's "Food-for-School Program", 59-62 percent; *Tulong para kay Lolo at Lola* Program, which was implemented during the 2008 global financial crisis, 61 percent; Philhealth Indigent Program, 50 percent; and NFA rice price subsidy, 41 percent.

The *Pantawid Pamilya* Program, a key pillar of the Aquino administration's social protection strategy, is intended to break the intergenerational cycle of poverty by ensuring that young-age children, particularly those 0-14 years old belonging to poor households, would grow up healthy and stay in school. Under the program, household beneficiaries, with up to three eligible children, receive a total cash grant of P15,000 per year if they meet certain health and education conditions. Launched initially as a pilot program in 2008, the program expanded rapidly, covering a total of about 4.4 million households in 2014 from only about one million in 2010. The program has been further expanded to cover, beginning 2015, 15-18 years old belonging to poor households, as well homeless street families and indigenous people. The program's budget for 2015 is about P65 billion, representing roughly 2.5 percent of total government budget or 20 percent of the total budget for social services.

Recent assessment on the *Pantawid Pamilya* Program's initial impact shows that, by and large, the program has been succeeding in keeping children healthy and in school (World Bank 2014b). Moreover, the findings of the study also indicate that household beneficiaries tend to invest in their children's education and that, contrary to frequent assertions in public discussions, the program has not encouraged dependency nor led to higher spending of vice goods. These results are encouraging, given the very poor performance—high leakage rate, high cost per peso of transfer to intended beneficiaries, unsustainable program benefits—of most poverty reduction programs in recent decades.

e. Continuing challenge of property right reform: CARP/CARPer

Another key constraint to rural development is the country's ineffective and costly asset reform program. In order to address the high inequality in the countryside, the government has been pursuing asset reform programs over the last four decades. Of these programs, the most far-reaching was the Comprehensive Agrarian Reform Program (CARP), including its mutation, the CARP Extension with Reforms (CARPer). The government spent a huge amount of money for CARP, estimated at Php236 billion (in 2007 prices). This amount is equivalent to 20 percent of total government spending on agriculture for the period 1988-2007. The extension of the land reform for another five years under CARPer was expected to incur an outlay of another Php150 billion. To appreciate the magnitude involved, a major elevated roadway ("flyover"), similar to that on Quezon Avenue and EDSA, is worth about Php1 billion. With Php236 billion, the government could have populated Metro Manila and neighboring areas with additional 200-plus flyovers!

What has been the impact of CARP/CARPer? Findings of several impact assessment studies have, at best, been mixed, partly because either the results are non-representative or comprehensive data are lacking. One result (Balisacan and Fuwa 2004), for example, indicates a positive impact on provincial growth and hence on poverty indirectly, but very small direct effect on poverty, especially during the last decade. Using the most comprehensive data set involving national agriculture and population censuses, nationally representative surveys of family incomes and expenditures, labor force surveys, and administrative records from implementing agencies, a team of researchers (see World Bank 2009b) has confirmed earlier

results showing that the direct effect of the agrarian reform program on poverty was disappointingly small, at least up to early 2000s. In particular, the observed changes in household incomes of farmer beneficiaries in agrarian reform communities (ARCs) were higher than, though not much different from, the changes observed for comparable farmer households in non-ARCs, all other things being equal. The change in poverty incidence observed for ARCs was also not much different from that for non-ARCs. To be sure, because of their relatively favorable initial-conditions (location, infrastructure development, and proximity to market centers), farms in ARCs tended to have higher productivity (by 15 percent) than those in non-ARCs, but coverage was limited to only about half of the agrarian reform beneficiaries (ARBs). Redistribution of private lands, if associated with complete titling and transfer, was found to impact positively on poverty reduction. The effect on poverty tended to be stronger if compulsory acquisition (of large private holdings) was the norm for the transfer. These positive effects tended to be overwhelmed by other features of the program—both design and implementation—that tended to inhibit efficiency, innovation, and poverty reduction. Overall, despite the huge spending for CARP over the past two decades, the program has not much to show in terms of improvement in household welfare in rural areas. Even these modest results may exaggerate the welfare effects because we don't know the counterfactual. For example, if CARP has “frozen” the land market (as suggested below), agricultural productivity will have grown more slowly, meaning that both beneficiaries and non-beneficiaries are on lower growth paths.

What has gone wrong? Although the CARP has good intentions, its design was poorly conceived, largely because of its grossly inadequate understanding of rural development dynamics and the political economy of asset reform in a regime of weak governance. For one, the CARP provisions were very restrictive, especially on transferability of land titles. RA 6657 and RA 9700 (the laws creating CARP and extending CARP, respectively) illegalize sale or lease of land titles for a period of 10 years from the effectivity of transfer (to agrarian reform beneficiaries), as well as impose ownership ceiling to five hectares.³ The transfer restriction has prevented the awarded land from being used as collateral, rendering the certificate of land ownership awards (CLOAs) not bankable. This has effectively curtailed farmers' access to credit since the restriction made the legal rural financial market to virtually disappear. The five-hectare ceiling on ownership, on the other hand, has precluded farms from adjusting their scale of operations to achieve efficiency, thereby driving private capital shy away from agriculture.⁴

Further, the most common mode of ownership transfer has been collective titles, not individual titles. What matters most to formal financial intermediaries are individual, unencumbered titles, not collective titles. Disturbingly, as of October 2007, about 71 percent or about two million hectares of the total land distributed under the agrarian reform program

³ Additional requirement for transferability is for the beneficiary to have paid off the land bank. This is likely to take 30 years or even more.

⁴ Even if economies of scale can be captured at 5 hectares of rice land for example, the same cannot be said for other crops such as sugar and coconut, especially when we consider economies from dealing in input and output markets as well as production economies.

were actually under collective ownership arrangements, about one-third of which were from government-owned lands. It is probable that the two million hectares have remained unproductive all these years because those lands do not carry much weight in credit access, i.e., those lands lack or have low collateral value. But even if those lands 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 as an individual farm operator rather as part of a collective production arrangement.

CARPer ended last year, but there are bills in Congress to further extend the program, particularly the acquisition of remaining large private lands. Lessons learned from the past 40 years of land reform must not be lost. The very long implementation of CARP has been very costly to farm efficiency and rural growth and is detrimental even to equity and poverty-reduction goals. The way forward is to restore a favorable legal environment for land markets in rural areas by removing the restrictions against ownership transfer and lease of land and relaxing land ownership ceiling to allow flexibility in scale of farm operations. The effort should also involve urgently sub-dividing the collective CLOAs into individual titles to put collateral value to lands awarded to farmer beneficiaries. Finally, the effort in reforming land management need to be complemented by a strong push for provision of public goods and support services, particularly access to well-functioning irrigation systems, profitable farming technologies, and supply and high-value chains, including global supply chains⁵.

f. Climate change, disasters, and agriculture

Climate projections for the country show increasing mean and concentration of rainfall (see Lansigan; and Lasco and Wilson in this volume), which implies that wet seasons will become wetter and that dry season will become drier. Climate projections also indicate increased frequency of extreme natural events. The country's geographical location makes it vulnerable to naturally occurring events (see Ravago and Roumasset, this volume). The country experiences an average of 20 typhoons each year. These naturally occurring events increases the country's disaster risk profile. Naturally occurring events becomes a disaster when local response capacity is limited, causing great damage and human suffering.

Disasters can negate social and economic gains and even push back development. This is one of the important lessons learned in the last six years when a single natural disaster can overturn gains in certain areas or sectors of the economy. This has been demonstrated by the country's experience with the Visayan earthquake in October 2013 and a month after, the typhoon Haiyan/Yolanda in November 2013. Damage and loss caused by typhoon Haiyan alone

⁵ Cognizant of the distinction between farm-workers and farmers, perhaps a two-pronged approach would make sense with a much freer approach towards beneficiaries wishing to sell their lands and more the development of market-based support services for those that wish to remain in farming. The best way to develop supply-chains is through the private sector, possibly led by larger commercial farmers.

is estimated to be PhP 571 billion (NEDA 2013). In 2009, direct losses to private and public assets owing to Typhoon Ondoy and Pepeng is estimated at PhP 206 billion, roughly 1.8% of GDP (Public Commission 2009). The agriculture sector, in particular, is very vulnerable to weather-related shocks (see Perez and Rosegrant, 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 (see Ravago and Roumasset, this volume for extent of agricultural damages).

It is imperative to strengthen the country's institutional preparedness to disaster. Broadly, investments in technologies, use of geohazard maps, institutions of early warning systems, building dikes, and increasing awareness have benefits that exceed the costs. Studies on the Philippines show \$3 to \$30 worth of benefits per \$1 of investment, depending on type of disaster or hazard (Kelman and Shreve 2013).

For the farmers, one implication of these climatic changes is that their prior experience about the frequency, duration, strength and timing of rainfall is less reliable than before. This further implies that the subjective probability distributions inherent in farmer decision-making maybe becoming more dispersed and that risk might be increasing (see Ravago and Roumasset, this volume). If true, the increased risk faced by the farmers accompanying these climatic changes may necessitate a facilitating role of the state in making, for example, insurance available. Innovations in weather index insurance at the country level avoid the problem of co-variance of risks at the village level. Investment in research that can offer additional risk-reduction strategies for farmers also reduce their vulnerability to weather related-shocks. This includes research and development on drought-tolerant and flood resistant crop varieties. Perez and Rosegrant (this volume) show that yield is higher for crops using climate smart technologies. Other studies further suggest that bundling insurance with tolerant varieties is more advantageous for farmers than doing either alone (Lybert and Carter 2015).

Disasters classified according to their probabilities of occurrence may elicit varied responses at the household and national level. For example, responses to low-probability/low-frequency natural disaster like earthquake and volcanic eruptions may be different from the response to high-probability/high frequency natural disaster like typhoon. Variation in risks, thus, could imply different policy responses. While it is recognized that, broadly, the benefits of investment in preparedness exceed the costs, the body of knowledge on the economics of disaster preparedness and response, especially in highly diverse geographic areas of developing countries, such as the Philippines, is scarce, 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 works--and what does not--in local disaster preparedness and response is rather poor despite the huge outpouring in recent years of good intentions and public advocacies for making communities, especially in rural areas, resilient to natural disasters. Clearly, governments, multilateral institutions, and philanthropic organizations have to walk the talk by investing in more research and better data to gain a better understanding of the policies, programs, and projects that will be economically appropriate for the conditions and circumstances of developing countries. One should not lose sight of the fact that what may have worked well in developed-country settings may not necessarily provide economically efficient and sustainable solutions to the problems faced by communities in rural villages of

developing countries. Good-quality data and good analysis are indispensable to evidence-based policy choices.

7. Concluding remarks

While the relative importance of agriculture in national income and employment has continued to decline, and while non-agricultural income growth has increasingly become the key driver of poverty reduction, agricultural development remains a powerful source of poverty reduction in many areas of the country. The power of agricultural income growth to deliver poverty reduction is expected to remain strong in areas where the geo-physical conditions favor agricultural productivity growth, such as in relatively flat landscapes with high potential for irrigation development, and in relatively "more rural"--remote, less commercialized--areas. Given sufficient connectivity infrastructure and a favorable policy and institutional regime, these areas can benefit from the rapidly growing food markets in the country's fast-urbanizing centers, or in rapidly transforming emerging economies, including those in the country's ASEAN neighbors.

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 need reorienting food-security policy toward facilitating--not inhibiting--trade, competition, and crop diversification. In particular, the current regime of quantitative restrictions (QR), together with high tariffs, on rice to achieve rice self-sufficiency 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 small farmers and landless workers do not benefit from the high prices because they are net buyers of rice. Moreover, NFA's "low price" for consumers is low only in reference to the domestic market price, but high in relation to comparable world prices (e.g., what the Thais, Vietnamese, or Cambodians pay for their rice consumption) owing to the combination of QRs, high tariffs on rice, poor logistics, and the highly restrictive regulatory environment for production, marketing, and distribution.

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 R&D (to develop technologies appropriate for local conditions), road network development, irrigation and flood control development, private-public partnership facilitation, and complete conversion of collective CLOAs to individual titles to facilitate credit flows to agriculture. In addition, conditional cash transfers to enhance human capital formation of poor farm households may enhance productivity as well as directly reducing poverty. The shift will necessarily involve changing the metric of success in agricultural development from just increases in national food production to increases in farmers' household income from both agricultural and non-agricultural 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 the poor—has much to do with the households' purchasing power, which rises when household incomes increase but falls when food prices rise.

The onset of the ASEAN Economic Community (AEC) at the end of 2015 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 agriculture sector. Indeed, for the country, the benefits of joining the AEC—or other regional groupings—have much less to do with those that come from getting access to the bigger regional market but perhaps more to do with those that come from domestic efficiency-enhancing reforms that are otherwise politically difficult to do owing to much-entrenched vested interests in various sectors of the economy and polity.

The prospect of climate change makes the implementation of these reforms even more imperative to cushion-off the economy from adverse impact any weather and climatic shocks. By virtue of the country's geographical location, it is inevitable not to experience naturally occurring events. The agriculture sector in particular is highly vulnerable to these climatic and weather disturbances as discussed in many chapters of this volume. Reforms in the institutions coupled with the appropriate investments create a resilient economy and contribute in avoiding naturally occurring events translate into a disaster.

The Aquino administration has succeeded in putting the economy onto a higher growth trajectory. Despite the rather shaky global headwinds and domestic challenges, the economy has soared to become one of the best performing emerging economies in the world and to achieve its best five-year average performance in the past 40 years. The key challenge for the next administration is sustaining the growth and making it even more inclusive to achieve faster poverty reduction. Reforming food policy in the way suggested in this chapter is paramount to winning with finality the war on abject poverty.

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