

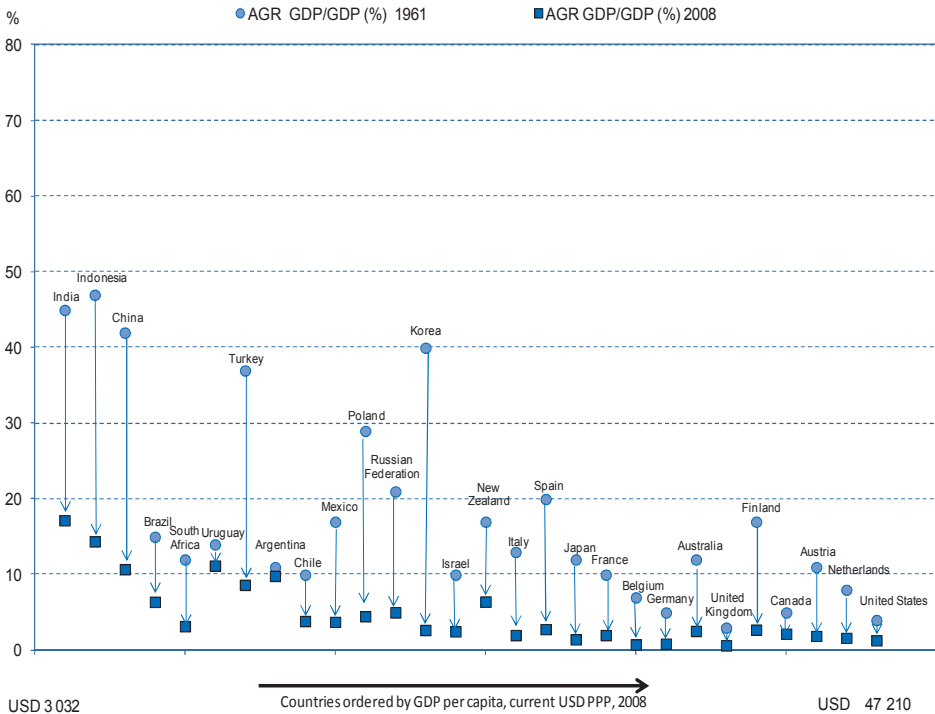
### 3. Long-term structural change and the agricultural transformation

The process of long-term economic development is characterised by a sectoral transition away from an economic structure based on agriculture to one dominated by manufactures and services.<sup>1</sup> The nature of this transition away from agriculture is apparent from the evolution of agriculture's share of GDP and employment, shown in Figures 3.1 and 3.2 respectively for a range of OECD and emerging economies between 1961 and 2008. Graphs showing the evolution of agriculture's share of GDP in a wider range of African, Asian and Latin American countries are contained in Annex 3.A.

In general, agriculture's contribution to GDP declines as the economy develops, to the extent that high income OECD countries rarely have more than 2%-3% of GDP generated by their farm sectors. For the sample of countries shown in Figure 3.1, agriculture's share of GDP has declined in *all* countries, including those with a strong comparative advantage in agricultural activities. A third point is that the decline of the share of resources in agriculture has been larger for countries with lower incomes, which have more scope for agricultural productivity improvements and for shifting resources into new non-farm activities (in developed countries, that shift has already occurred).<sup>2</sup>

Across the developing world, we see this pattern confirmed.<sup>3</sup> In Latin America, agriculture's share of GDP has declined to less than 10% of the total in most countries, and is less than 20% in nearly all countries. In Asia, the ratio is above 30% in a few countries but has declined to between 10% and 20% across most of the continent. Agriculture's share of GDP has also declined in most African countries, but in several of the poorest countries, all with a per capita income of less than USD 1 000 per year and with agriculture still accounting for a third or more of GDP, the sector's share of GDP has actually risen over the past 30 years. The majority of these countries have had weak or negative economic growth and have been marked by conflict or civil strife, attesting to the particular development challenges faced in the region.<sup>4</sup>

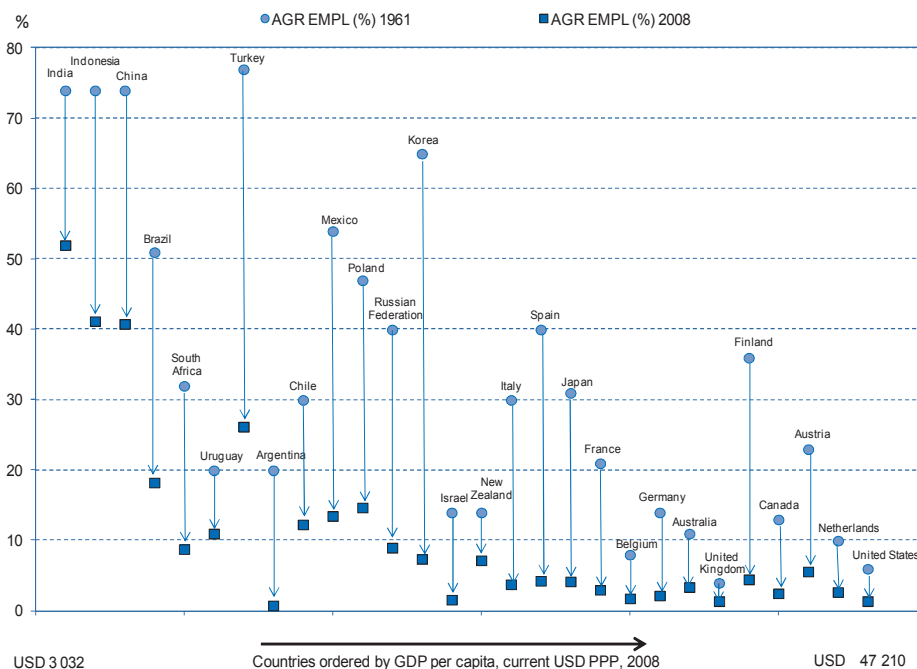
**Figure 3.1. Evolution of agriculture’s share of GDP in various countries 1961 to 2008**



Source: FAO (1999), *Improving the income of farmers and rural people*; WDI (2008), *World Bank Development Indicators*; IMF (2008), *IFS International Financial Statistics Online*; national sources.

The declining share of agriculture in GDP is matched by the release of labour to other sectors, although that release appears to be non-linear (Figure 3.2). At low levels of development, there is evidence that the structural transformation has become progressively less successful at integrating low productivity agricultural labour into the rest of the economy (Timmer, 2010). Yet while it may be more difficult for unskilled farm labour in poor agriculture-dependent economies to be absorbed by other sectors than it was for, say, European farmers to move into industrial jobs a century earlier, once labour adjustment is underway – and, crucially, once labour has relevant skills – its pace is invariably more rapid than in the past. In Korea, agriculture’s share of employment fell from 40% to 16% in just 14 years – a transition which took 53 years in the United States and 68 years in the United Kingdom (the first country to go through the industrial revolution).

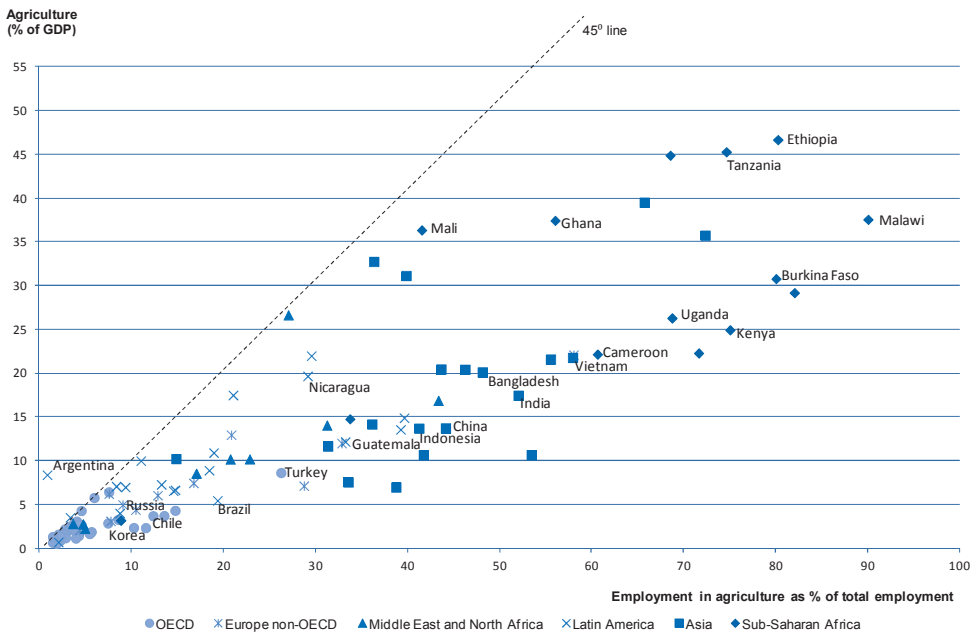
**Figure 3.2. Evolution of agriculture's share of employment in various countries 1961 to 2008**



Source: FAO, 1999; WDI, 2008; IMF, 2008, national sources.

Asymmetries in the adjustment process are apparent from Figure 3.3, which compares agriculture's share of GDP with agriculture's share of employment for recent years in a large number of developed and developing countries. The 45-degree line corresponds to a situation in which the sector's share of GDP and its share of employment are equal, implying that labour is as productive in agriculture as in other sectors.<sup>5</sup> Nearly all countries lie below this line, suggesting that agricultural labour is less productive (and hence receives lower returns) than non-agricultural labour, but there are wide differences across countries. As economies develop, and agriculture's share of both income and employment declines, labour productivity in agriculture tends to converge with that in other sectors. Yet for many poor countries that convergence appears to be deferred.

**Figure 3.3. Agriculture's share of GDP versus agriculture's share of employment 2008**



Source: World Development Indicators (2010) and national sources.

What drives these changes? The answer is the interaction between supply-side and demand-side effects. Productivity improvements permit a release of resources which may be absorbed within the rural economy, via a market for non-farm goods and services, or drawn in by the urban economy. On the demand side, once basic food demands are satisfied, the income elasticity of demand for food tends to be less than for other consumption goods, so the demand for food grows more slowly than the demand for other goods.

There has been an historical tendency to assume that productivity grows less rapidly in agriculture than in the manufacturing sector, partly because there is less scope for benefiting from the division of labour. Indeed dual models of transition, such as the Lewis Model (Lewis, 1954) typically contrast a stagnant traditional rural sector with a dynamic and modern manufacturing sector. However, others have observed rapid science-based technical change in agriculture (for example, Hayami and Ruttan, 1985).

If agricultural productivity growth outpaces productivity growth in other sectors, we tend to observe a more rapid release of labour – the “push” out of the sector complementing the “pull” from relatively fast demand growth outside the sector. Despite this release of resources, the agricultural sector typically continues to expand in absolute terms. Those leaving the sector tend to be those who have not participated to the full extent in productivity improvements, and have thus become relatively less profitable, and those who have superior prospects in other sectors. On the other hand, if agricultural productivity growth is relatively slow, then that transition occurs more slowly and – when non-agricultural demand growth is weak – may not occur at all.

The pace at which resources are released from agriculture also depends on the international forces of supply and demand. Net demand for exports from overseas may slow the adjustment process, while increasing import competition in the form of lower prices may accelerate it. The balance of these pressures should, in principle, be a reflection of a country’s comparative advantage. Historically the terms of trade have tended to move against agriculture, as supply growth has outpaced demand growth. Insofar as prices reflect production costs, declining real prices are not a problem for innovative farmers, whose productivity changes are responsible for the price changes. However, for less efficient farmers, there is clearly a threat to profitability which, along with the possibility of improved opportunities in other sectors, can determine exit decisions.

In Figure 3.4, the countries furthest from the 45-degree line are those in which labour productivity in agriculture has languished and the sector has not been effectively assimilated into the rest of the economy. Improvements in the productivity of agricultural labour will tend to close the gap directly, while the outflow of less productive labour to more productive occupations in other sectors will narrow it indirectly. Several analysts have suggested that, in poor countries, the former can provide a more “pro-poor” pattern of development, with a particular need to focus on smallholder development (for example, Hazell *et al.*, 2007; FAO and World Bank, 2009). The direct impacts of smallholder-led growth are likely to be pro-poor because the majority of the poor live in rural areas, where agriculture is the dominant economic activity and smallholder farming is the predominant structure. Smallholder-led development can increase returns to assets that the poor possess – their labour and in some cases their land – and push down the price of staples, which is crucial when so many of the poor are net buyers of food. Indirectly, the benefits of smallholder-led growth are also likely to be pro-poor, because of potentially strong linkage effects to the rest of the economy.<sup>6</sup>

Yet, with development, one would expect the economy to diversify and for growth outside agriculture to become progressively more important as a source of income growth. Moreover, in the long term, manufactures and services are capable of generating annual growth rates of 10% or more, whereas growth rates in agriculture seldom exceed 5%. How then should governments strike the balance between boosting incomes in the context of existing structures, where there is more immediate scope for poverty reduction, and facilitating the transition to a more diversified economy which has the potential to generate much higher average incomes?

Timmer (1998) has suggested that the basic supply and demand forces driving adjustment are associated with a four-phase adjustment process for the agricultural sector, with correspondingly different policy requirements. In the early stages of development, agriculture dominates output and employment, and the priority is to “get agriculture moving”. The subsequent generation of a surplus within agriculture leads to a second period in which agriculture makes a key contribution to growth both directly and via a variety of linkages. In the third phase, as the economy diversifies, agriculture’s share of national income declines and agricultural incomes fall behind those in other sectors, so the priority lies in facilitating adjustment. The fourth and final phase is one in which the agricultural sector, including agricultural labour markets, are integrated into the rest of the economy.<sup>7</sup> This pattern is consistent with a U-shaped adjustment process where, initially, employment in agriculture declines more slowly than the sector’s share of GDP, but then there is a more rapid release of labour from the sector as average incomes improve.

The adjustment process is also reflected in the World Bank’s distinction between agriculture-dependent, transforming and urbanised economies. According to its 2008 World Development Report, approximately 170 million rural poor live in agriculture-dependent economies (mostly in Sub-Saharan Africa).<sup>8</sup> A much larger number of rural poor – 583 million in 2002 – live in transforming economies, a large proportion of them in China and India. The majority of the rural poor in Latin America live in “urbanised” countries.<sup>9</sup> Even among agriculture-dependent economies, non-agricultural activities still account for the majority of national income, and there are few cases globally in which agriculture accounts for more than a third of GDP. Moreover, as discussed below, even development at low incomes is associated with a release of labour from farming. Thus while there may be a need to “get agriculture moving”, there is a parallel need to create opportunities outside agriculture as well as within it.

Different circumstances suggest a need for differentiated strategies, with agriculture prioritised at early stages of development.<sup>10</sup> In terms of establishing the framework conditions, this is likely to imply a greater role for policy in overcoming market failures and a greater share of public expenditures going to providing essential public goods (such as agricultural research and rural infrastructure). With market failures likely to be more endemic in poorer countries, it has further been suggested that a different set of agricultural policy instruments is appropriate – a point taken up later.

Many of those farmers adjusting, both to more profitable operations within the sector, and out of the sector will be smallholders, who dominate developing country agriculture.<sup>11</sup> So what are the implications for farm-level adjustment? There has been much debate over the relative efficiencies of small versus large farms. A range of benefits from small scale family farming have been noted. For example, farm labour may be easier to motivate and supervise, while smallholders may have important local knowledge and may be more adept at managing some forms of risk. On the other hand, there are important economies of scale beyond the farm in areas such as procuring inputs, obtaining information on markets and technical farming issues, in meeting standards and certifying production, and in transacting with large scale buyers from processors and supermarkets, with their exacting demands (Wiggins, 2009).

Some of this debate may be beside the point, insofar as the relevant comparison is between small farms of less than a few hectares and not between small farms of less than a hectare and mega farms of several hundred hectares or more. Small farms may be technically and allocatively efficient, given the existing level of development, but economies of scale beyond the farm gate are likely become more apparent as the economy develops. In much of Africa, only a minority of farms produces a marketed surplus. A change in average farm size from say 0.5 ha to 2 ha, with more farmers recording market sales, would still correspond to small scale farming, but would nevertheless require a significant degree of farm level adjustment – in particular the release of labour from the sector. Moreover, consolidation would appear to be necessary to generate substantially higher per capita incomes, irrespective of efficiency considerations.

It is important to note that recognition of these adjustment pressures does not imply an anti-agriculture policy prescription, or that policy makers should seek to accelerate the shift of labour into other occupations. But it does require realism, a recognition that policy priorities will shift with economic development, and that not all small farms can be expected to evolve into successful commercial structures. In general, there is a need for balance in development, such that the release of labour from agriculture, which itself derives from productivity improvements, is matched by a

concomitant demand from other sectors – i.e. labour is “pulled” rather than “pushed” out.

For all these reasons, while there may be a need for differentiated development strategies, there is a common need – across countries at all stages of development – to create opportunities both within and outside agriculture.



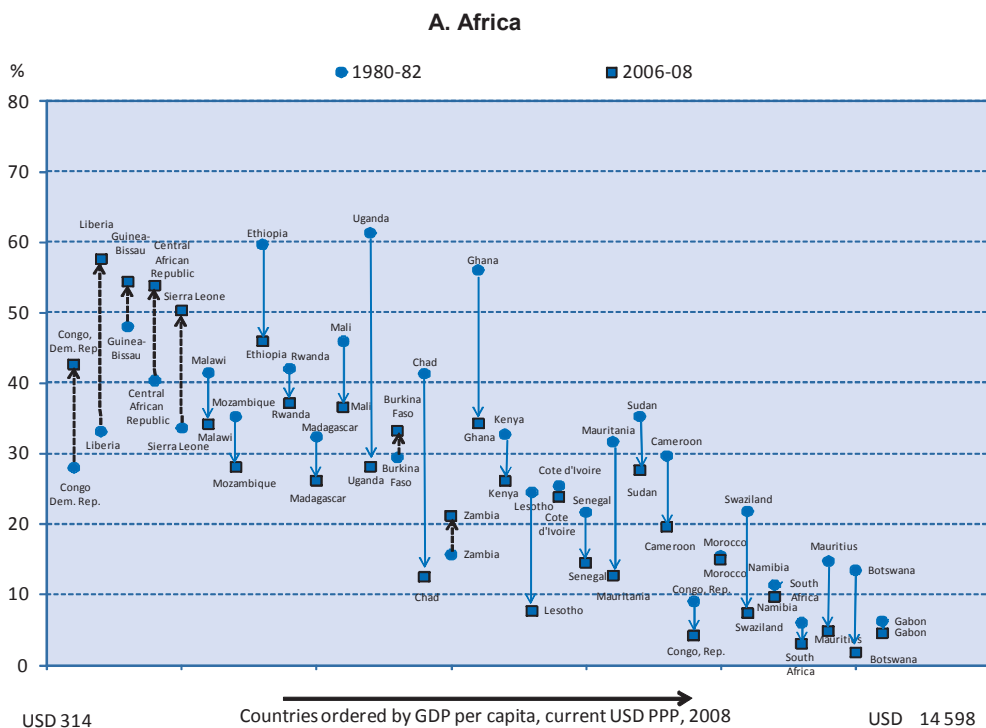
### *Notes*

1. Other features of structural change with implications for policy include: a spatial transformation towards increased urbanisation; an institutional transformation to an economy based more on formal legislation than informal rules; and a demographic transformation, with falling death rates preceding lower birth rates.
2. There are some exceptions, such as Brazil and Chile, where the changes have been large in absolute terms, but low relative to other countries at similar income levels. In these particular countries, import substitution industrialisation policies led to a rapid growth in manufacturing prior to the base year, bringing down agriculture's share of GDP; while more recently the liberalisation of policies has mitigated the tendency of resources to shift out of agriculture, as these countries have exploited their natural comparative advantage in agricultural activities.
3. See *A Strategic Framework for Strengthening Rural Incomes* (OECD, 2010a).
4. Agriculture's declining economic importance can be mistaken for economic malaise. Yet it is typically a sign of success, with agricultural output continuing to grow, but requiring fewer resources.
5. However, caution should be exercised in interpreting specific numbers as the definition of agriculture used in measuring GDP may not be the same as that used in recording employment.
6. Empirically, a number of studies have confirmed that agricultural growth tends to be effective in reducing poverty (Irz *et al.*, 2001; de Janvry and Sadoulet, 2009).
7. These four phases are associated, respectively, with the work of Mosher (1966); Johnston and Mellor (1961); Schultz (1964) and Ruttan (1977); and Johnson (1973).
8. People are considered poor if they had an income below a USD 1.08 a day incomes threshold in 2002 (measured in 1993 purchasing power parity dollars).

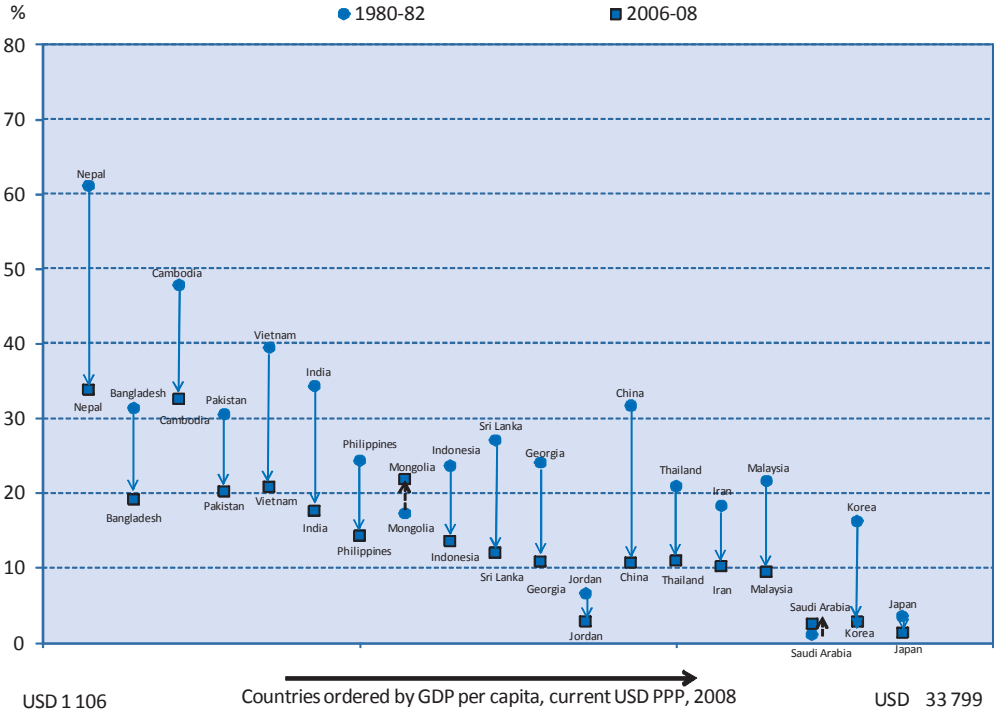
9. The World Bank defines agriculture-based economies as those in which agriculture contributes 20% or more to overall economic growth. Transforming economies are those in which agriculture contributes less than 20% to total growth yet 60% or more of the country's poor live in rural areas. Urbanised economies are those in which agriculture contributes less than 20% to overall growth and less than 60% of the poor live in rural areas. More than 80% of the rural poor in Sub-Saharan Africa live in agriculture-based countries, while over 90% of the poor in Asia, the Middle-East and North Africa live in transforming economies. A majority of Latin America's poor live in urbanised countries, although nearly one-half of the poor still live in rural areas. There are virtually no countries where agriculture contributes more than 20% to growth but in which the numbers of urban poor exceed the numbers of rural poor. Among developing countries, there is a strong correspondence between these three categories and three income classes for countries (low income, lower-middle income and upper-middle income) also specified by the World Bank.
10. Dorward (2009) has proposed three types of transformation strategy: "hanging in" strategies, which are concerned to maintain and protect current levels of wealth and welfare in the face of threats of stresses and shocks; "stepping up" strategies, which involve investments in assets to expand the scale or productivity of existing assets and activities; and "stepping out" strategies, with accumulation of assets to allow investments or switches into new activities and assets.
11. The term "smallholder" refers not to farm size *per se*, but to producers with limited resource endowments relative to other farmers in the sector. Smallholders often struggle to be competitive, either because of this lack of endowments, or because they confront missing or under-developed markets. Insufficient farm size may be an issue, although other assets, such as farm management skills may also be lacking. The competitiveness of smallholders may also be undermined by external factors, such as subsidised exports arriving on internal markets. It is important to note that what constitutes a small farm may differ markedly from one country to the next. For example, the average farm size in many Asian countries is less than a hectare, whereas much larger operations in Latin America (ten hectares or more) may be considered as small.

### Annex 3.A

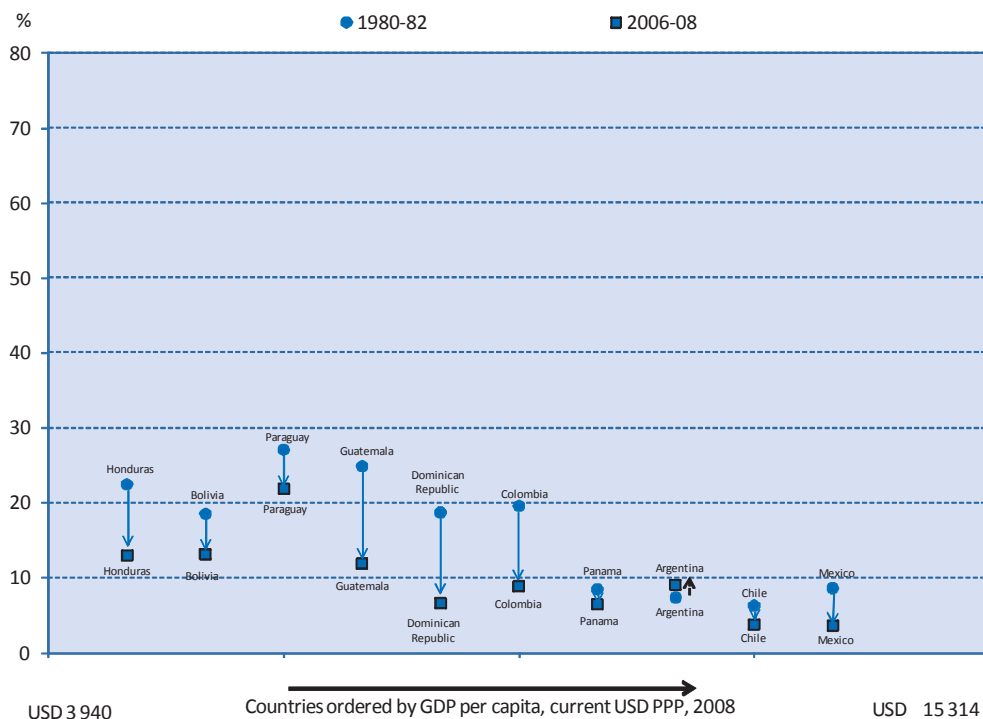
## Evolution of agriculture's share of GDP in Africa, Asia and Latin America, 1980-82 to 2006-08



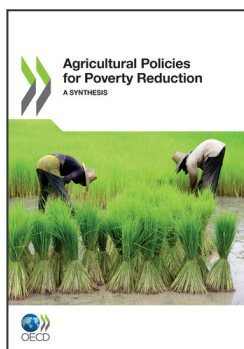
**B. Asia**



### C. Latin America



Source: World Bank World Development Indicators (2010).



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