Agricultural Employment Trends in Asia and Africa: Too Fast or Too Slow?

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Contrary to conventional economic theories, the relationship between income growth and agricultural employment is extremely diverse, even among regions starting from similar levels of development, such as Asia and Africa. Due to its labor-intensive Green Revolution and strong farm–nonfarm linkages, Asia’s development path is mostly characterized by fast growth with relatively slow agricultural exits. In contrast to Asia, urban biased policies, low rural population density, and high rates of population growth have led a number of African countries down a path of slow economic growth with surprisingly rapid agricultural exits. Despite this divergence both continents now face daunting employment problems. Asia appears to be increasingly vulnerable to rising inequality, slower job creation, and shrinking farm sizes, suggesting that Asian governments need to refocus on integrating smallholders and lagging regions into increasingly commercialized rural and urban economies. Africa, in contrast, has yet to achieve its own Green Revolution, which would still be a highly effective tool for job creation and poverty reduction. However, the diversity of its endowments and its tighter budget constraints mean that agricultural development strategies in Africa need to be highly context specific, financially sustainable, and more evidence-based. JEL codes: O13, O15, O18

Long-run economic growth has been accompanied by a significant exodus of workers out of the agricultural sector. This observation was regarded as a robust stylized fact by early development economists and was incorporated into a wide array of development theory (Lewis 1954; Hirschman 1958; Kuznets 1973; Chenery 1979). Subsequent research has added important nuances to this observation—for example many agricultural workers move into the local nonfarm economy rather than to urban areas (Anderson and Leiserson 1980)—but the basic conclusion that development entails “agricultural exits” has rarely been
questioned. Since 1960, however, trends in economic development and agricultural employment shares have systematically diverged: most of Asia has grown quickly but many Asian workers have stayed on the farm; and most African economies have made virtually no net real-income gains in the four decades from 1960 to 2000 (especially since 1980), though large numbers have left the farm, often for burgeoning cities.

We explore the causes of this divergence between Asia and Africa, and also attempt to answer two “so what?” questions. First, does it matter that workers are leaving agriculture more or less quickly than the norm (if there is a norm)? In other words is there anything special about agriculture that makes employment outcomes in that sector an important policy objective? Second, what sorts of development strategies would promote agricultural employment or accelerate the transition out of agriculture?

Research on and around these questions has a long history in mainstream development debates. Much of the concern in the 1950s and 1960s was with over-urbanization and the emergence of megacities in Latin America and Asia. After Sovani’s (1964) balanced critique of the over-urbanization thesis, economists remained relatively quiet on the subject, although Harris and Todaro’s (1970) work was a landmark paper in demonstrating how rational migrants could induce suboptimal outcomes at the macroeconomic level by adding to the problems of urban unemployment and congestion. The early literature on Asia’s Green Revolution also demonstrated that new technologies could generate significant employment growth both in agriculture and, via spillovers, in the rural nonfarm economy (Mellor 1976). The 1979 World Development Report (WDR) on Structural Change and Development Policy demonstrated that while “urbanization in the industrialized countries took many decades, permitting a gradual emergence of economic, social, and political institutions to deal with the problems of structural transformation, the process in developing countries is occurring far more rapidly,” especially in Latin America and sub-Saharan Africa. And although the report argued that intra-urban population growth was the primary cause of urbanization, it did conclude that urban-biased policies were accelerating rural to urban migration. Following Lipton (1977), the urban bias hypothesis continued to be explored by researchers both within and outside the World Bank (Bates 1981, World Bank 1984, 2000; Krueger, Schiff, and Valdes 1991; Fay and Opal 1999).

Three decades on from the 1979 WDR, the 2008 and 2009 WDRs (World Bank 2008, 2009a) are also reflections on these issues, and they justifiably pose new questions in light of additional facts and new knowledge. The WDR 2008 on Agriculture for Development (which an earlier version of this paper contributed to as a background paper) re-examines the roles that agriculture plays in growth and poverty reduction processes, and also distinguishes between economies at different stages of urbanization and agricultural employment shares (World Bank...
But it also poses new questions about the challenges of agricultural exits (World Bank 2008, ch. 9), especially the rural employment challenge, a theme just as relevant to Asia’s “slow exit” problems as it is to Africa’s “fast exit” problems. The 2009 WDR on Spatial Disparities and Development Policies also focuses on the rural–urban transformation, as well as related issues of territorial development and regional integration.

This article very much bridges the central themes of the 1979, 2008, and 2009 WDRs. In the next section we reinvestigate the relationship between economic growth and agricultural employment, though we also question the validity of the apparent break between Asia and Africa’s development paths. We then seek to account for what appears to be a genuine divergence in Asia and Africa’s agricultural exit paths, before examining the possibility that Asia’s surprisingly slow urbanization may be related to rising spatial inequality, shrinking farms, and increasingly jobless growth. In the next section we examine the African context, where agriculture has long been neglected and where its future is still under debate. We conclude with a discussion as to how policymakers can address these problems.

Agricultural Exits and the Growth Process: Economic Theories and “Stylized Facts”

Structural change is a broad term which covers the shift of output, employment, and livelihoods away from the rural agricultural sector toward a predominantly urban nonagricultural sector. We will primarily focus on the shift from agricultural to nonagricultural livelihoods using measures of nonagricultural employment shares, rural nonfarm employment, and urbanization.

What does economic theory lead us to expect? Although schools of thought differ as to their explanations of why structural change should accompany economic growth, all schools emphasize that structural change is intimately connected with the growth process. For example industrialization strategies emphasize a modern industrial sector as the engine of growth. In this view agriculture is largely a backward, unproductive sector in which labor operates at low levels of productivity—it may even be characterized by zero marginal productivity or surplus labor (Lewis 1954)—and agriculture has weak upstream and downstream linkages with other sectors (Hirschman 1958). In contrast modern industry is a sector with considerable technological potential, increasing returns and agglomeration externalities, high degrees of labor intensity (at low levels of industrialization), and strong linkages to other sectors. The differential economic potential between the sectors is such that a transfer of labor and capital from agriculture to nonagriculture constitutes a significant source of both structural change and economic growth.\(^1\)
A second school of thought argues that agriculture can be an engine of growth, certainly at the early stages of development. As agriculture is often more labor intensive than nonagricultural industries (Schultz 1964), gains in agricultural productivity can contribute to higher employment and incomes, better nutrition and faster poverty reduction, and prevent distress migration from rural areas into urban unemployment. The Green Revolution demonstrated agriculture’s considerable technological potential, as well as the benefits of its extensive upstream and downstream linkages to broader economic growth (Bezemer and Headey 2008). Indeed the potential of a dynamic agricultural sector to keep food prices low (and thereby curb wage inflation), to provide foreign exchange earnings via exports, and to increase rural demand for nonfarm production and consumption goods are all factors which suggest that agriculture can make substantial contributions to the industrialization process (Johnston and Kilby 1975). So this agriculture-first view also predicts that structural change and growth go hand in hand, but it distinguishes itself from the industry-first school by asserting that agricultural growth significantly drives nonagricultural growth, especially at the early stages of development (Hazell and Diao 2005; Diao and others 2007; Bezemer and Headey 2008).

From Theory to Experience: The Stylized “Facts” of Structural Change and Growth

Despite different assumptions and very different policy prescriptions, both views posit a strong positive association between measures of structural change and economic growth. With respect to the share of nonagricultural output in total output, this hypothesis is still well supported by the stylized facts: nonagricultural output shares rise in a fairly systematic fashion as GDP per capita rises, both in the long run and the short run (see World Bank 2008, figure 1.2). But what about nonagricultural employment in total employment or, as a cross-check, the shares of the urban population in the total population? Are these measures just as strongly correlated with GDP per capita?

Superficially the answer is yes. Figure 1 demonstrates the conventional “long-run” association between GDP per capita, the nonagricultural labor force share, and the urban population share. Several facts are of note. First, the relationships are somewhat nonlinear, suggesting that structural change measures increase more rapidly than income in early stages of development (see also World Bank 2008, figure 1.2). Second, the nonagricultural labor force shares increase to higher levels than urbanization shares, suggesting that the rural nonfarm economy becomes increasingly important as development proceeds. Third, the relationship between sectoral employment shares and income is stronger than that of urbanization shares with income. Fourth, a number of Asian countries tend to be well under the “on average” log-linear regression lines, perhaps
suggesting some degree of under-urbanization; likewise, a number of non-Asian countries are well above the regression lines, perhaps suggesting over-urbanization. But despite these outliers, both relationships are reasonably strong: correlation coefficients with income per capita are in excess of 0.70 for both of these population measures.

On the basis of this strong “long-run” relationship one might be tempted to conclude that the stylized relationship between growth and agricultural employment remains robust. But this static snapshot largely obscures the diversity of agricultural exit paths since the end of the colonial era. In figure 2 we map out income and agricultural exit paths for various developing Asian and African countries over the period 1960 to 2000. Squared tips on these paths signify endpoints for the year 2000; the opposite ends signify the starting points in 1960. The figure reveals that the trajectories for Asian and African countries are very different from each other. Asia—especially East Asia—has grown very quickly from a generally low base, though nevertheless experiencing surprisingly slow agricultural exits. In most Asian countries an income increase of $1,000 per capita only resulted in a 10-point increase in the urban population share. China’s low rate of urbanization is especially well documented, but Indonesia has followed
a remarkably similar path, and India is on a similar trajectory despite less substantial income gains. Other Asian countries—Sri Lanka, Malaysia, Bangladesh, Thailand, Vietnam, Nepal, Pakistan—have followed a parallel route but with even lower nonagricultural employment levels. The one exception in this Asian sample is the Philippines. From 1960 to 1980 that country followed the usual East Asian path of fast growth (a gain of roughly $1,250 per capita) and modest agricultural exits (just a 7-point increase). But a sharp growth deceleration from 1980 to 2000 left income unchanged, even though Filipinos continued to leave the farm.

Despite starting from a similar base, Africa has followed an opposite path to Asia’s, although its story is more nuanced. Africa’s largest country, Nigeria, has experienced 40 years of large numbers of people leaving agriculture, despite no significant GDP growth (in fact Nigeria’s real GDP per capita actually declined by $300 during 1960–2000, while the reported share of nonagricultural employment in the total population increased by almost 40 percentage points). As for the rest of Africa, this basic trajectory still holds, but not quite so dramatically, and its dynamics are more similar to those of the Philippines than to Nigeria. Other sub-Saharan African countries experienced modest rates of growth and agricultural exits from 1960 to 1980, before experiencing 20 years of stagnant income growth which coincided with a continued shift out of agriculture.
Moving beyond averages, agricultural exit rates within Africa really fall into three tiers over the 1980–2000 period. One group that experienced rapid changes in nonagricultural employment shares of 20 percentage points or more consists mostly of oil producers like Cameroon, Sudan, Angola, and Nigeria. A second group experienced shifts of 10–15 percentage points (for example Sierra Leone, Ghana, Rwanda)—which is still high compared to Asia’s trajectory. A third group witnessed changes of less than 10 percentage points (including Ethiopia, Africa’s second largest country).

These dynamic portraits of alternative agricultural exit paths therefore tell a very different story to that of the long-run snapshot in figure 1, but we need to be careful about reading too much into them. On the basis of figure 2, for example, one might conclude that since Asia has experienced the most rapid economic growth, its process of slower agricultural exits represents a “best practice” benchmark. However, employment decisions could merely be a by-product of other growth determinants, such as agricultural and industrial policies, yet not have any causal influence on growth by themselves. Even more confounding for our analysis is the possibility that these stylized facts are actually biased by some serious data issues.

Stylized Facts or Stylized Falsehoods?

Are the remarkably divergent trajectories of Asia and Africa real, or are they somehow induced by biases originating from either economic growth data or employment data? In truth, both sets of measures are far from perfect. Biases in something as commonly used as GDP data are often overlooked, but it is possible that China’s growth is somewhat overestimated (see for example Maddison 1998; Rawski 2001; Wang and Meng 2001; Holz 2004) and that Africa’s is somewhat underestimated because of a larger informal economy (Schneider 2005; Henderson, Storeygard, and Weil 2009). In other countries, such as the Philippines, the omission of overseas workers’ remittances will also lead to under-estimation of real income growth. Yet biases in GDP data pale in comparison to those found in employment and urbanization data, which are flawed due to conceptual problems as well as infrequent and imprecise measurement. The UN urbanization estimates are widely contested, for example, and it is well known that definitions of ‘rural’ and ‘urban’ vary substantially across countries and, for some important countries such as China, across time (Headey, Bezemer, and Hazell 2008). Issues with employment data are much less discussed and more pertinent to this paper, so we will look at these more closely.

In table 1 we compare male nonagricultural employment shares from the standard FAO/International Labour Organization (ILO) data to estimates derived from the Demographic Health Surveys (DHS). In principle, both purport to measure the
same thing: the primary occupation of adults, both male and female. ILO data are based on official labor force surveys and population censuses, but the ILO faces a number of challenges in deriving internationally comparable data. First, the paucity of survey/census data is serious indeed, so much so that reported ILO labor force participation data are actually extrapolations from an econometric model, with only about 20–30 percent of the full panel data pertaining to actual survey/census data (ILO 1996, 2008). For African countries, however, this ratio is only 6.5 percent. Second, labor force surveys are known to be both urban biased and gender biased, with women’s participation in agriculture often underreported for cultural reasons (on urban biases in labor force surveys, see Timmer and de Vries 2007; on gender biases see ILO 2008). In comparison, while the DHS do not have the objective of measuring occupational data or other economic variables, the fact that the surveys cover nearly all African countries in a nationally representative fashion suggests that they make a useful benchmark. Moreover all the DHS data are drawn from surveys carried out in the late 1990s or 2000s, and are thus very recent. Note, however, that DHS are not carried out for China.

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\begin{array}{|l|c|c|c|}
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\text{Region/country} & \text{No. obs.} & \text{FAO} & \text{DHS} & \text{Difference} \\
\hline
\text{Central America} & 6 & 51.6 & 51.5 & -0.2 \\
\text{East Africa} & 8 & 23.3 & 31.4 & 8.0 \\
\text{Central Asia}\text{a} & 6 & 76.8 & 54.6 & -22.2 \\
\text{South America} & 4 & 61.9 & 64.4 & 2.5 \\
\text{Other South Asia} & 4 & 30.7 & 46.8 & 16.0 \\
\text{Southern Africa} & 23 & 39.3 & 34.7 & -4.7 \\
\text{West Africa Sahel} & 12 & 22.2 & 32.9 & 10.7 \\
\text{West Africa Coastal} & 19 & 42.0 & 39.8 & -2.3 \\
\text{Nigeria} & 1 & 70.3 & 66.4 & -3.9 \\
\text{Philippines} & 1 & 53.8 & 56.4 & 2.6 \\
\text{Indonesia} & 2 & 55.9 & 61.2 & 5.3 \\
\hline
\text{No. obs.} & \text{FAO} & \text{National source} & \text{Difference} \\
\hline
\text{China}\text{b} & 1 & 35.7 & 53.1 & 17.4 \\
\text{India} & 1 & 55.9 & 52.1 & -3.8 \\
\hline
\end{array}
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\text{a} For simplicity, Central Asia includes the Ukraine and Turkey, which are not normally regarded as Central Asian countries.

\text{b} Chinese data relates to both male and female employment for both FAO and the national source.

Notes: For Nigeria the DHS estimates were sensitive to treatment of unemployment data. Excluding all unemployment lowered Nigeria’s nonagricultural employment share, but we opted to distribute the rural unemployed to the agricultural and nonagricultural sectors based on the (non)agricultural employment shares of the employed rural male population.

Sources: FAO (2009) and DHS (2009). Indian and Chinese data are drawn from their respective national statistical agencies.
so we use Chinese Bureau of Statistics data for the comparison of Chinese statistics. We also do the same for India because national sources are probably more reliable there than those of the DHS.

Table 1 suggests that there are some large differences between the two sources, especially in particular regions. FAO/ILO nonagricultural employment shares look relatively low for East Africa, other South Asia, and the West African Sahel, but much too high in Central Asia. Also of interest are some of the larger countries in East Asia as well as Nigeria. We find that the FAO/ILO may slightly overstate nonagricultural employment in Nigeria, although the DHS estimate still suggests that two-thirds of Nigerian men have already left agriculture as a primary occupation. In the Philippines and Indonesia the differences are not large, but DHS puts nonfarm employment at over 60 percent in Indonesia. More disconcertingly the data suggest that the ILO may be substantially underestimating nonagricultural employment in China, for which we report both male and female employment together. FAO/ILO estimates put this figure at just 36 percent, while national data sources put it at 53 percent. Of course this is still considerably lower than Nigeria, even though average Chinese incomes are five times higher than Nigerian incomes. As with China our Indian benchmark comes from a national source, although in this case the estimate matches the FAO estimate quite closely.

Another important issue is the extent to which individuals adopt diversification strategies, working in both agriculture and nonagriculture on either a part time or seasonal basis. The primary employment data in table 1 obviously completely bypass this important issue. Of particular interest is the hypothesis that while rural Asians may not have moved to cities in huge numbers, they have had the opportunity to diversify into the rural nonfarm economy. Data issues again pose a challenge to assessing this bias given differing definitions of ‘rural’ and other comparability issues. What data there is also show a nuanced message on differences between Asia and Africa. On the one hand, DHS data for the late 1990s and 2000s indicate that Africa’s rural nonfarm employment shares average around 27.5 percent once some small countries are excluded (Lesotho, Swaziland), while Asia’s is around 36.8 percent (and just 33 percent if the Philippines is again excluded as an outlier). However, income data show a larger gap. Winters and others (2008), for example, use 15 household surveys to show that rural nonagricultural income shares range from 34–81 percent in five Asian countries, but are under 50 percent in four African countries; and earlier evidence in Haggblade, Hazell, and Reardon (2007b) show that manufacturing is a much more important rural nonfarm activity in Asia than it is in Africa. Hence the usual conclusion is that Asia has a much more vibrant rural nonfarm economy, a topic we take up in subsequent sections.

In summary, we find that although various biases in employment and demographic data might explain some of the divergence in employment trends between
Asia and Africa, they don’t eradicate the difference altogether. For the most part, Asia really has grown quickly, but it has experienced a surprisingly slow exodus from agriculture, though balanced to some degree by a higher diversification into the rural nonfarm economy. Africa, in contrast, has witnessed a large exodus from agriculture, often to burgeoning cities (some 10,000 people are estimated to migrate to Lagos every day), despite virtually no real income gains. So whilst the rapidly divergent trajectories between Asia and Africa might be partially closed by better data, the large residual divergence still presents us with a set of stylized facts worthy of further investigation.

Explaining the Divergence between Africa and Asia

Why have so many Africa countries experienced a significant structural shift in employment in the absence of significant economic growth? And why have most of Asia’s fast-growing economies not experienced larger structural shifts? Whilst employment shifts and migration have complex country-specific determinants (Karp 2007; de Brauw and Carletto 2008), we focus on the principal factors that would seem to explain this broad divergence across Africa and Asia.

Specifically, we argue that the slower than expected employment exit in Asia can be attributed to at least six factors. First, Asia’s Green Revolution catalyzed rapid growth in farm incomes and labor productivity, making it more attractive for workers to stay in agriculture. Second, the Green Revolution technologies were, initially at least, highly labor intensive, creating many additional productive jobs. Third, the rural nonfarm economy (RNFE) grew more rapidly in Asia—driven initially by increases in agricultural income, dense population, and settlement patterns—enabling many farm households to diversify their incomes whilst still relying on agricultural activities for their principal livelihood. Fourth, dense settlement patterns also meant that rural people had relatively good access to public services in rural areas and didn’t need to migrate to cities to improve the basic quality of life. Fifth, many farmers cannot easily exit farming and it is instead their children who leave the farm. Farm exits simply take time—over several generations in today’s industrial countries—and Asia’s unprecedented rates of growth in per capita GDP could well be building up a backlog of potential exits for the future. Sixth, in some countries there have been barriers to rural–urban migration (for example China) that have made agricultural employment exits more difficult.

An important point is that many of these drivers reflect Asia’s aggressive investment in agricultural and rural development over the past five decades, as well as accelerating rates of national economic growth. Asian governments have consistently expended 10–15 percent of their total budget on agriculture. During the
Green Revolution era most of this went into agricultural R&D, irrigation, and rural roads. Asian governments also provided direct policy support to agriculture by shoring up farm credit systems, subsidizing key inputs—especially fertilizers, power, and water—and intervening in markets to ensure that farmers receive adequate and stable prices each year, and that small farmers were not left behind. (Djurufeldt and others 2005). Many Asian governments directly promoted rural nonfarm activities (Mukherjee and Zhang 2007; Otsuka 2007), while rural–urban inequality in the supply of public health, education, and social services has also been relatively low in Asia.

Africa, in contrast, has pursued a very different pathway that has encouraged rapid rural–urban migration. African governments essentially failed to induce a Green Revolution. The adoption of modern techniques has been much lower there compared to all other developing regions (see World Bank 2008, figures 2.1 and 2.2), and per capita agricultural output stagnated and even declined over much of Africa since 1960. Stagnating farm incomes, weak growth in productive farm jobs, and rapid population growth have all contributed to encouraging workers to seek alternative livelihoods in the cities. Poor infrastructure, more dispersed settlement patterns, and slow growth in agricultural incomes have also contributed to a low return RNFE sector that encourages rural–urban migration over rural income diversification (Reardon 1997).

The reasons for the underlying failure of agricultural and rural development in Africa are complex, but they can broadly be grouped into exogenous factors (that is endowments) and endogenous policy-related factors (Johnson, Hazell, and Gulati 2003). In terms of the former, Africa is exogenously constrained by its geography. It possesses much more diverse agricultural conditions and outputs than Asia. FAO data suggest that in 1980 about a quarter of total crop land in Asia was devoted to rice, wheat, and maize—the first crops to benefit from high yielding varieties—whereas just 11 percent of Africa’s cropped area was devoted to these crops, and most of this was maize. Sustained R&D has produced high-yielding African crop varieties, such as the International Institute for Tropical Agriculture (IITA)’s improved cassava varieties, but producing and disseminating these varieties has taken longer, and R&D and extension activities have long been underfunded in Africa.

Rural population density in Africa is also much lower than it is in Asia. Using geospatial mapping, figure 3 reports estimates of the population density experienced by the average rural African. The figure indicates that most rural Africans live in areas that are much less densely populated than rural Asia. Low population density implies land abundance and isolation from large urban markets, which constrain the demand for technologies that would more intensively utilize existing land as techniques like fallow farming (rotating fields) are an alternative to fertilizers for the maintenance of soil fertility (Binswanger and McIntire 1987).
Moreover isolation from large urban markets keeps land prices low and encourages the persistence of low value crops, raises the costs of inputs, and reduces the prices farmers receive for outputs. Finally, low population density constrains the growth of the rural nonfarm economy (Haggblade, Hazell, and Reardon 2007b) and makes the provision of economic infrastructure and social services more costly (Hewett and Montgomery 2001).

With regard to policies, African governments generally discriminated against both agriculture and rural populations through biases in macroeconomic policies and public investments (Lipton 1977; Bates 1981; Krueger, Schiff, and Valdes 1991; Hazell and Diao 2005). As Bezemer and Heady (2008) discuss, urban biased development policies partly arose because of historical and ideological forces dating back to colonial policies, the import-substitution-industrialization strategies of the 1950s and 1960s, and the neglect of agriculture among foreign aid donors. But such biases are also institutionalized by the political disenfranchisement of the rural poor (and in some cases disenfranchisement of particular rural ethnic groups), who lack the economic and political conditions for effective political action (Binswanger and Deininger 1997).

How important are these policy factors today? With the structural adjustments of the 1980s and 1990s, macroeconomic distortions against African agriculture have indeed declined—but so have public investment and foreign aid to the sector.
Welfare measures also still indicate very high differences between rural and urban populations. The World Bank’s *Rural Poverty Report* (2003), for example, finds that access to safe water, improved sanitation, and education and health services is generally 20 to 30 percentage points higher in urban than in rural areas. Hewett and Montgomery (2001) find that 88 percent of Africa’s urban households receive electricity, as compared to just 5 percent of rural households. Consistent with this welfare gap, Africa’s rural poor seem to be increasingly migrating to urban areas (Ravallion, Chen, and Sangraula 2007).

**Asia’s Slower Exit out of Agriculture: A Successful Strategy Now Running out of Steam?**

In the previous section we told an Asian story that bore all the hallmarks of an economically successful development path in which agriculture served as the principal engine of national poverty reduction. Much of Asia thereby mitigated many of the problems associated with rapid agricultural exits and urbanization, especially rising urban unemployment and its related problems. But despite their previous success, Asian economies arguably face a number of challenges. Although parts of East Asia will experience an aging of their populations over the next few decades (see below), much of South and Southeast Asia will still experience a sharp rise in the number of working age adults. It is already clear that Asian agriculture has limited prospects for absorbing the majority of these new workers. Declining yield growth, shrinking farm sizes, decreasing labor intensity, demographic change, and “brain drain” are all major challenges for Asian agriculture, as is the persistence of poverty among particular social groups and geographically disadvantaged regions that were largely bypassed by the Green Revolution. Urbanization projections (for what they are worth) suggest that there will be about 8 million new urbanites per year in China, 11 million per year in India, and 16 million per year in the rest of Asia (Bocquier 2004). In this section we assess the hypothesis that Asia does indeed have a growing backlog of agricultural workers who require more employment opportunities outside of agriculture. Specifically, we look at three significant pieces of evidence consistent with this conjecture.

**Diminishing Returns in Asian Agriculture**

Asia’s Green Revolution began over four decades ago, and in almost all instances resulted in rapid growth in yields over a number of years. Maintaining high growth rates has proved increasingly difficult, however, such that yield growth in key staples has declined from 2–3 percent per annum in the 1970s to around
1 percent per annum in the last decade or so (World Bank 2008, pp. 66–7). This is partly the result of inevitable technological barriers, but is also due to unsustainable policies that encouraged the wasteful use of fertilizers, electricity, and irrigation. Water, especially, is becoming an increasingly large constraint on yields, with the ground water overdraft rate estimated to exceed 25 percent in China and 56 percent in India’s north-west breadbasket, while absolute water scarcity is thought to affect over 850 million people in developing Asia (IWMI 2007).

An additional constraint is farm size. Principally because of rural population growth, average farm sizes in Asia are shrinking markedly (table 2). In India they fell from an average of 2.3 hectares in 1971 to 1.4 hectares in 1995/96; in Pakistan from 5.3 to 3.1 hectares; and in Bangladesh from 1.3 to just 0.6

\[ \text{Table 2. Changes in Average Farm Size and Number of Small Farms} \]

<table>
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<tr>
<th>Country</th>
<th>Census year</th>
<th>Average farm size (ha)</th>
<th>Number of small farms* (millions)</th>
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<td>1971</td>
<td>2.3</td>
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<td></td>
<td>1995/96</td>
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<td></td>
<td>1996</td>
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<td></td>
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<td>Pakistan</td>
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* The definition of a small farm is 2 hectares for all countries except Thailand, where Anriquez and Bonomi (2007) define small farms as less than 1.6 hectares.
— Not available.
Source: The majority of the data are from Nagayets (2005), although much of the data on the number of small farms are from Anriquez and Bonomi (2007).
hectares. We estimate that in 2000 there were roughly 340 million farms in developing Asia smaller than 2 hectares.

Whether these smallholders are microeconomically inefficient has been a subject of perpetual debate since Berry and Cline (1979), if not earlier. Reviews of the issue by Fan and Chan-Kang (2005) and Anriquez and Bonomi (2007) suggest that small farm productivity varies over regions, over levels of development, and over how one defines ‘efficiency’ (for example as ‘land productivity,’ ‘labor productivity,’ or ‘total factor productivity’). What is not in dispute, however, is that the successful adoption of modern technologies by Asian smallholders has resulted in significant poverty reduction, an outcome which is difficult to envisage being achieved through allocating resources to large farms. But can this process be sustained? Two more contemporary concerns must now enter this debate. The first is whether the economic viability of smallholders is declining because of the growth of agribusiness and globalization processes (Joshi, Gulati, and Cummings 2007). The second is whether Asian farm sizes are now declining to the point where they will be inefficient, even if they were not so in the past. Many small farmers are now part-time, for example, and may not be as driven by efficiency concerns as before. Shrinking farm sizes may also explain why the rural nonfarm (RNF) sector appears to have been considerably more vibrant than the farm sector in many parts of rural India (Foster and Rosenzweig 2004).

**Persistent Rural Poverty and Rising Rural–urban Inequality**

Despite a history of high agricultural growth rates and rural income diversification, Asia is still characterized by large numbers of people who have not significantly benefited from rapid economic growth (Fan and Hazell 2001). The poorest of the poor are often concentrated in geographically adverse regions (for example isolated mountainous regions in Eastern India, Western China, Northern Thailand, and Vietnam), in tribal regions or among low caste groups, and in areas with particularly poor governance or political instability (for example India’s Bihar state). Absolute poverty numbers are also a significant problem in Asia, especially in rural areas. Whilst China made great strides in reducing rural poverty in the 1980 s, absolute numbers of poor people have remained stubbornly high in many other parts of Asia (World Bank 2008, p. 3) and may even have increased in absolute numbers in India during the 1990 s (Deaton and Kozel 2005).

Part of the rising inequality may be connected to the feminization and aging of rural labor forces (Buvinic, Gwin, and Bates 1996; Mehra and Gammage 1999), which may impede labor force mobility. But this is still uncertain, as solid evidence for agricultural labor force feminization is scarce to date. De Brauw’s (2002) empirical study for China actually finds the opposite: the
The proportion of farm work being done by women was declining over the late 1990s, and future feminization of agriculture in China is judged unlikely. Anriquez and Bonomi (2007) collate data from various agricultural censuses and find that feminization of the rural labor force is only a concern in Africa, and that rural aging issues are not of pervasive concern in any country in their sample. However, that sample did not include China, where increasing numbers of older rural people are being left behind by economic growth (Benjamin, Brandt, and Giles forthcoming).

Somewhat surprisingly, however, rural–urban inequality shows no signs of having systematically increased in Asia (Eastwood and Lipton 2004), although spatial inequality has risen markedly in China, India, and Indonesia (Milanovic 2005), again reinforcing the importance of lagging regions. China is a significant case in that both spatial inequality and rural–urban inequality have been rising rapidly. In China, rural–urban inequality was relatively high in the pre-1978 period (especially given that overall inequality was very low), but it decreased markedly during the period of major agricultural reforms in the early 1980s (due to the household responsibility system and the dual track price mechanism). However, from 1985 to 1999 China’s income distribution changed along a number of different dimensions: rural–urban inequality increased back to its 1978 level, spatial inequality rose markedly (Kanbur and Zhang 2005; Milanovic 2005), and overall income inequality has risen from an admittedly very low Gini coefficient of 0.22 in 1978 to a relatively high 0.45 in 2003 (Chotikapanich and others 2007). With the exception of Vietnam, China’s structural features are quite unique, so it is not clear that other Asian countries are as vulnerable to rising inequality as China has been. Nevertheless China’s experience demonstrates some of the costs of restrictive migration policies and spatially biased reform strategies (Kanbur and Zhang 1999), which have brought rapid growth at the cost of rising inequality.

**The Threat of Jobless Growth**

The aforementioned factors suggest that Asia’s agricultural sector will still need to shed many more workers in years to come. A preliminary sign of that problem is that output-employment elasticities (OEEs) in Asian agriculture have declined over much of the 1990s (Bhalla and Hazell 2003; Bhattacharyya and Sakthivel 2004; Khan 2007). Ultimately the greatest challenge for Asia’s vast population will be creating enough nonagricultural jobs, and at a fast enough rate. Recent evidence suggests that the labor intensity of manufacturing growth is declining over most of Asia, including Asia’s largest countries, China and India. Khan’s (2007) comprehensive review of a series of United Nations Development Programme (UNDP) country studies on employment and output growth are
These studies confirm a tendency toward declining employment intensity in agriculture, but they also suggest declining employment intensities in manufacturing. In India, capital-biased industrial policies and prohibitive labor regulations have led to an economic structure ill-suited to India’s labor abundance (Besley and Burgess 2004; Kochhar and others 2006). China’s story is more complex as it partly relates to the varying fortunes of China’s Town and Village Enterprises (which were a source of significant labor absorption in the 1980s before credit constraint slowed their growth), and partly to the gradual shedding of surplus labor from state-owned enterprises (Khan 2007). Prior to the recent financial crisis, rural–urban migration in China looked set to add further pressure on nonagricultural labor markets, but this trend will mostly like resume once the short-term effects of the crisis abate. Between 1999 and 2003, for example, the number of internal migrants in China roughly doubled, from 52 to 98 million, and China’s 2000 census indicated annual migration rates of 8.5 percent of the workforce, with roughly 30 percent heading to local townships, 30 percent to other counties in the same province, and 40 percent representing movement across provinces (Du, Park, and Wang 2005).

### Table 3. Trends in Output-employment Elasticities (OEEs) in Seven Asian Countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Trend</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>Agriculture started shedding labor from the early 1990s, but this was reversed for a period starting in 1997. Industries and services experienced sharply falling OEEs. Overall employment performance has been poor. The problem appears essentially to be one of poor management of transition.</td>
</tr>
<tr>
<td>Indonesia</td>
<td>Employment performance was good prior to the crisis. OEE in manufacturing fell sharply in the recovery period. There was a reversal of the long-term reduction in agriculture’s share of employment. On balance employment performance has been poor in the recovery period.</td>
</tr>
<tr>
<td>Malaysia</td>
<td>OEEs have shown no trend reduction. Growth has been employment friendly overall.</td>
</tr>
<tr>
<td>Philippines</td>
<td>Estimates of employment intensity in the case study are inadequate to arrive at a firm judgment although it appears, from findings of other studies, that there were institutional obstacles to labor absorption in agriculture and manufacturing.</td>
</tr>
<tr>
<td>Thailand</td>
<td>OEEs were higher for the nonagricultural sectors in the 1990s (until 1996) than in the 1980s but the overall OEE was lower due to the fact that agriculture’s OEE turned from a positive value in the 1980s to a highly negative value in the 1990s. In the recovery period the OEE for manufacturing fell somewhat but the same for construction and services rose. The Lewis transition in agriculture of the 1990s was reversed.</td>
</tr>
<tr>
<td>India</td>
<td>In the post-reform period the OEEs fell and employment growth fell as compared to pre-reform period. But real wages rose presumably due to a supply-induced tightening of the labor market.</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>With the exception of a few subsectors of industries and services OEEs were reasonably high and growth was employment intensive.</td>
</tr>
</tbody>
</table>

*Source: Adapted from Khan (2007).*
To summarize, we know that most of developing Asia has achieved remarkable feats of growth and poverty reduction with relatively little urbanization, largely through a combination of rapid agricultural growth and spatially dispersed industrial growth. However, the potential of Asian agriculture to keep people on the land has diminished markedly in recent decades, and there are justified concerns that the sheer number of jobs that need to be created outside of Asia’s agricultural sector will impose a daunting challenge on the region. Such challenges would be large for any economy, but they are now magnified because the same problem is emerging simultaneously for a number of very populous Asian countries. Previous research has attempted to assess what the implications are of cheap and abundant Asian labor on labor markets in other regions of the world, such as Latin America (Wood 1997). But one might also ask whether large Asian countries will also experience lower employment growth as a result of increased competition from each other (that is in export markets).6

Agricultural Employment and Agricultural Potential in Sub-Saharan Africa

The exodus of so many African people from agricultural activities, in spite of minimal or even negative economic growth, potentially poses a serious challenge to the conventional thinking that structural transformation is part and parcel of economic development. The 2008 World Development Report, for example, distinguishes between agriculture-based, transforming, and urbanized economies, but the extreme case of Nigeria seems to be one of transformation without development. Moreover, African agriculture’s poor performance has induced pessimism in some quarters with regard to the sector’s capacity to achieve rapid growth and poverty reduction. Hence in this section we revisit the ongoing debate as to whether African agriculture really has the potential to achieve the kind of job creation, poverty reduction, and structural transformation that the Green Revolution achieved for Asian economies.

The Case for Agriculture-based Development Strategies in Sub-Saharan Africa

One of the reasons agricultural growth is thought to be so important at initial stages of development—especially for poverty reduction—is simply one of arithmetic. Consider a stylized economy in an early stage of development: the majority of the population is rural and mostly engaged in the production of a few staple crops; most rural people are poor and typically more so than urban people (Sahn and Stifel 2003; World Bank 2003); and food consumption is a large share of a
typical household’s budget (50 percent or more). In this kind of economy the potential for a given growth rate in food production to raise the incomes and nutrition levels of most of the population, including the poorest, is tremendous (Diao, Headey, and Johnson 2008). The single most important commodity group for poverty reduction and nutritional improvements—(staple foods)—becomes cheaper for both the rural and urban populations, and the two most important assets that the poor own—their labor and their land—are suddenly in much greater demand (Lipton 2009).

There are some qualifications to this stylized model, of course. First, the more food prices fall, the weaker is the incentive farmers have to increase agricultural production (Diao, Headey, and Johnson, 2008). Second, if the addition to farmers’ incomes is also spent on food, demand for nonfarm labor may be limited (Dercon and Zeitlin 2009). Third, if unskilled wages do go up (or if food prices don’t fall), other sectors may become less competitive, which could inhibit rather than promote structural transformation (Lewis 1954). Because of these tradeoffs there is potentially a role for strategic trade and pricing policies aimed at redistributing the effects of agricultural production growth across consumers, producers, unskilled workers, and the domestic and world economy. However, the basic reasoning of this simple model is sound, and there is also ample historical, econometric, and household modeling evidence to confirm these basic intuitions (Ravallion and Datt 1996; Djurfeldt and others 2005; Chen and Ravallion 2007; Ravallion, Chen, and Sangraula 2007; Christiaensen, Demery, and Kühl 2006; Ivanic and Martin 2008; World Bank 2008).

Perhaps the most important aspect of this model, especially in the current context, is the extent to which a given agricultural growth rate raises the demand for labor. This channel is especially important because Africa is undergoing the early stages of the so-called demographic transition in which the working age population becomes large relative to the dependent population (the very young and very old). Figure 4 shows that since 1985 Africa’s age dependency ratio has started declining, and that it is expected to decline at a faster rate until at least 2050. The “demographic window” presented by this decline in age dependency ratios presents Africa with both an opportunity and a threat. The opportunity arises because the increasingly larger share of productively employed adults in a population raises incomes per capita, which in turn creates opportunities for increased investments in human and physical capital for the next generation. As figure 4 shows, age dependency ratios started declining in Asia in the early 1970s, and previous research has shown that the region’s unusually fast demographic transition accounted for one-third to one-half of East Asia’s dynamic growth rates during the period 1965–1990 (Bloom and Williamson 1998). However, that research also suggested that the benefits of the transition are not inevitable. If African economies cannot create sufficiently productive...
employment—as East Asia did—these countries will end up bypassing this
unique growth opportunity. Worse still a large population of underemployed
young men greatly raises the threat of conflict: one study estimates that the risk
of civil war is increased from 4.7 to 31 percent if the share of young men in the
population doubles (Collier, Hoeffler, and Rohner 2007).

This reasoning suggests that the goal of creating productive employment
should be much higher on Africa’s development agenda. Existing evidence also
suggests that smallholder-based agricultural growth could be an engine of job cre-
creation in predominantly rural economies, and that it should generally be preferred
to largeholder-based growth because of small farmers’ greater use of both family
labor and hired labor (Hazell and Diao 2005; Lipton 2009). As for nonagricul-
tural sectors, data on labor intensity are far too scarce and labor intensities vary
so much that we are reluctant to generalize. However, we do know that many
leading nonagricultural sectors in Africa, such as mining, are much less labor
intensive than agriculture. This means that in a typical agriculture-based
economy a purely nonagricultural growth strategy is overburdened from an
employment perspective. Turning back to the stylized agriculture-based economy
we considered above, let us assume that the agricultural population share is
around 70 percent, the growth in the labor force is around 3 percent per annum
(an average for developing countries in the 1990s), and that agricultural
growth is at least somewhat more labor intensive than nonagricultural growth.
(for example a growth elasticity of 0.5 versus one of 0.3 for nonagriculture). If an industry-first strategy implies that agricultural production only keeps up with population growth, then a simple back-of-the-envelope calculation suggests that nonagriculture would have to grow by over 20 percent per year to absorb surplus labor (Headey, Bezemer, and Hazell 2008). It is also significant that while East Asian countries like China and Vietnam have achieved remarkable rates of industrial growth in the last few decades (typically in excess of 10 percent per annum), they still would have incurred significant unemployment problems had agriculture also not grown by 4–6 percent per annum. So from a job creation perspective, smallholder agriculture-based growth looks the best bet.

Limitations of the Agriculture-first Model in Sub-Saharan Africa

However, most critics of agriculture-first models do not contest the labor-intensive nature of smallholder-based growth. Instead they argue, for various reasons, that agriculture-based growth prospects in Africa are simply very limited. One potentially very important criticism is that Asian experiences cannot simply be transplanted to Africa. And indeed, as we noted above, Africa’s agronomic endowments are very different to those of Asia, especially in terms of the diversity of crops produced, the extent of irrigation, the diversity and quality of soil and climate types, and the generally lower population density. This implies that more locally adapted high-yielding varieties (HYVs) must be produced, while greater land availability in some parts of Africa suggests that the demand for HYVs and other land-intensive technologies may be more limited than was the case in population-dense Asia (Binswanger and McIntyre 1987). Yet despite these limitations Africa does have a number of both experimental and localized R&D success stories (Haggblade and Gabre-Mahdin 2004), such that the real question is arguably why these success stories are so rarely scaled up. Agroclimatic diversity could partly explain the poor uptake, but low R&D expenditures, pricing biases, insufficient investments in complementary investments (for example infrastructure), and unfavorable political economy factors also seem explain the divergence between African and Asian agriculture (Djurfeldt and others 2005; Bezemer and Headey 2008).

A second problem with an agriculture-based strategy for Africa is that, relative to Asia, many African economies are abundant in oil or other mineral resources (Nigeria, Angola, Cameroon), and the group seems to be getting larger as countries like Chad, Ghana, and Uganda have recently started to develop large oil deposits. This naturally prompts some economists to argue that the comparative advantage endowed by resource abundance implies that agriculture has diminished in importance in Africa (Collier 2007; Dercon 2009). However, this argument seems to rely on some implicit assumptions that are questionable at best.
First, even if growth is regarded as the sole economic objective, the general equilib-rium implications of oil revenues are not very favorable because oil sectors have weak and potentially negative linkages to other sectors (because of the inflation-ary effects of “Dutch Disease”). Second, if governments are trying to reduce poverty, then job creation is of the utmost importance. However, by themselves the oil and minerals sectors have very limited employment potential because they are capital intensive sectors. In other words, oil might have a comparative advantage in growth, but it certainly does not have a comparative advantage in poverty reduction.

A second weakness with the conventional comparative advantage viewpoint is that much of agriculture’s economic potential lies in the African market where there is ample scope to substitute food imports with domestic food production (Diao, Headey, and Johnson 2008). Even oil-rich Nigeria’s recent economic success has been predominantly driven by agriculture. From 2000–07 agricultural GDP growth in Nigeria accounted for almost half of the impressive doubling of national GDP, while the industrial sector accounted for just one-quarter. Hence over 2000–07, a period of rising oil prices, it looks like agriculture was the leading growth sector, not oil. Moreover, it so happens that many of Africa’s most mineral-rich countries are also those with tremendous biophysical potential for agricultural production. Nigeria has very good rainfall, relatively good soils, attractively large urban markets, good access to export markets via its coastal ports and its northern borders into the Sahel, and—despite high levels of population density in some parts of the country—large tracts of unexploited but fertile land. The Democratic Republic of Congo has similar if not greater biophysical potential, but larger infrastructure constraints (Ulimwengu and others 2009), and Angola is in a similar situation. Cameroon, which is gradually running out of oil, is probably Africa’s best example of strong agricultural growth in recent years, although it too has yet to fulfill its true potential in agriculture. The message here is that mineral abundance does not rule out an important role for agriculture. Indeed, one of the primary uses of increased oil revenues in Africa should be the promotion of agricultural and rural development.

A third objection often raised in the African context is that even if agriculture-based strategies were a good idea 50 years ago, it may now be too late to pursue this strategy because so many Africans have already left depressed rural areas in search of jobs in big cities (Bryceson 2002). Indeed our own results above might seem consistent with the conjecture. However, a closer look at the data suggests that this argument is probably overstated. In table 4 we again examine the arguably more reliable 2003 DHS data on employment for Nigerian men and women, since Nigeria is the most urbanized country of any size in sub-Saharan Africa. Several facts stand out. First, the proportion of the urban population share is probably exaggerated in Nigeria and perhaps elsewhere in Africa (Headey,
Bezemer, and Hazell 2008). The nationally representative DHS survey puts the rural population share at around 60 percent, which is consistent with a recent study that uses the spatially disaggregated data of GIS-type techniques to improve upon the UN’s widely criticized urbanization estimates (Uchida and Nelson 2008). Hence, more accurate data would imply that there is still a large rural population in Nigeria and other African countries that may not need any significant relocation in order to participate in agricultural activities. Recent in-depth studies suggest that participation in the agricultural labor market in rural Africa are far greater than large-scale household surveys suggest (World Bank 2008).

A second fact discernible from table 4 is that a large proportion of Nigeria’s male labor force in rural areas is unemployed (24 percent) or employed in low skilled nonfarm sectors, while most rural women are typically in low skilled services (55.7 percent). In conjunction with significant tracts of unused fertile land, these figures would imply that the prospects for a growing agricultural sector to provide meaningful employment for rural Nigerians stuck in low return nonfarm activities look favorable, especially since there are typically very few barriers to entry in agricultural labor markets. And in most other African countries the rural population share is much higher than in Nigeria. In short the vast majority of Africans (especially the poor) still live in rural areas and have adequate access to land. On these grounds, at least, agriculture-based strategies are certainly not redundant.

A fourth objection to agriculture-based development strategies in Africa is that they ignore endogenous growth processes, including the economies of scale associated with manufacturing, and the agglomeration externalities that come with urbanization (Krugman 1991; see Henderson 2003 and Quigley 2008 for excellent reviews). These arguments merit further research because the size of agglomeration economies are particularly hard to estimate. However, on the basis of existing evidence and theory, their existence would only seem to qualify marginally the importance of agriculture in Africa, especially in the medium term (see Headey, Bezemer, and Hazell 2008 for a fuller discussion). This is because

<table>
<thead>
<tr>
<th>Table 4. DHS-based Estimates of Occupation Shares in Nigeria, 2003</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Not employed</strong></td>
</tr>
<tr>
<td>------------------</td>
</tr>
<tr>
<td>Men Rural</td>
</tr>
<tr>
<td>Total</td>
</tr>
<tr>
<td>Women Rural n.a.</td>
</tr>
<tr>
<td>Total n.a.</td>
</tr>
</tbody>
</table>

n.a. Not applicable.

Notes: Data are the percent distribution employed in the 12 months before the survey. Key statistics are highlighted in italics.

rapid urbanization is generally associated with rising urban unemployment for the reasons listed above, as well as significant problems with public service delivery (Hewett and Montgomery 2001). African experiences like Nigeria’s show that urbanization alone is simply not enough to sustain durable and widely shared growth. Moreover, agricultural development should not always be thought of as competing with nonagricultural growth processes. Agriculture can actually support the growth of cities by increasing demand for nonfarm services, by keeping food prices low (which in turn keeps real urban wages competitive), and by freeing up scarce foreign exchange for industrial imports rather than food imports. Because of these spillovers it is no coincidence that Asia turned into the world’s factory after experiencing a smallholder-based Green Revolution, and that the reverse is true in sub-Saharan Africa where urban food prices are often surprisingly high and manufacturing is generally uncompetitive (Headey, Bezemer, and Hazell 2008).

Finally, most of the existing arguments about the sectoral role of policies relate to comparisons of the expected benefits of agricultural and nonagricultural growth in terms of growth and poverty reduction. But in theory an optimal development strategy requires allocating investments until marginal cost–benefit ratios are equalized across sectors. In reality, however, we have very little data on the returns to various public expenditures, especially in Africa. What data there are generally indicate high social returns to agricultural R&D and rural infrastructure (see Fan 2008 for various case studies in Asia and Africa), but against this evidence runs a significant tide of mostly anecdotal assessments of the weakness of Africa’s agricultural ministries (Headey, Benson, and Kolavalli 2009) and the poor state of its agricultural R&D institutions (Pardey and others 2006). Perhaps the only encouraging view vis-à-vis these assessments is that Asia’s Green Revolutions were primarily driven by government elites rather than their own poorly regarded agricultural ministries (World Bank 2008). In this view the binding constraint is not the capacity of agricultural ministries but the political will of the governing elite.

**Development Strategies for Managing the Transition out of Agriculture**

This article has identified a startling divergence in the agricultural exit paths of developing countries. While economic growth is traditionally accompanied by more rapid agricultural exits, fast-growing East Asian countries have generally only experienced modest ones. Slow-growing Africa, in contrast, has often witnessed surprisingly rapid agricultural exits, and in some oil-rich countries—Nigeria, Cameroon, Gabon—extremely rapid ones. To some extent these different
paths are the result of different endowments, but very different policy regimes also explain the divergence, especially the success of the Green Revolution in Asia and its failure in Africa.

Despite this historical divergence, we have argued in this paper that Asia is still facing some daunting employment problems. In Asia there is a paradoxical food situation today. On the one hand, there are millions of increasingly affluent Asians who are rapidly diversifying and enriching their diets. Yet despite this growing food affluence for many, about 800 million Asians still live in abject poverty, and hunger and malnourishment are surprisingly persistent. These people desperately need better livelihood opportunities. In the nonfarm sector, rural–urban migration (especially from less favored areas) could often be the best solution, but recent evidence suggests that Asia’s manufacturing sectors are struggling to create enough jobs (Khan 2007). This suggests that Asia’s rural economies need to continue providing new job opportunities. In agriculture the most promising prospect for poor Asian farmers is to tap into urban-led economic growth, particularly the shift toward more affluent Asian diets. Yet the key lesson of the Green Revolution is that, if left to market forces alone, many poorer regions and poor people are likely to be left behind in modernization processes (Rosegrant and Hazell 2000). Asia’s high population density also implies that the RNF sector may have a comparative advantage in employment creation because transaction and labor costs in rural Asia are generally low. Yet Asia’s RNF sector is still been hindered by the neglect of government policies, especially those relating to rural credit, education, and infrastructure (Haggblade, Hazell, and Reardon 2007a). So for all their success to date, Asian governments have unfinished business in the war against rural poverty.

In Africa, this war has scarcely begun. Despite rapid urbanization in a few countries, most of Africa’s poor still reside in rural areas and still rely on agriculture to eke out a living. Even in Nigeria, Africa’s largest economy and the one in which the agricultural exodus is starkest, agricultural growth still has considerable potential to reduce rural and urban poverty. So the real question in Africa is arguably not whether agriculture has potential, but how that potential can best be exploited. The main lesson Africa can learn from East Asia is that labor-intensive agricultural growth in egalitarian tenure systems is extremely pro-poor and can provide the foundation for successful nonfarm diversification (Bezemer and Headey 2008).

Yet Africa’s capacity to simply transplant the Asian Green Revolution model is limited. Africa is not only geographically more diverse, its political economy is also different. Asia’s agricultural initiatives were sparked by a combination of famines, higher food prices, and nationalist politics. In most of Africa’s more fertile countries the production of food staples has often been ignored because basic food security was less of an issue historically, because natural resources and
traditional cash crops offered more lucrative earnings for government coffers, and because nationalist tendencies were undermined by ethnic conflicts. For these and other reasons food security has typically only been regarded as a high priority in drought-prone areas such as Ethiopia, Malawi, and the Sahelian countries. However, one of the few beneficial effects of the global food crisis of 2007–08 is that the political support for improving national food security has undoubtedly been reinvigorated in a number of African countries. The question is whether this political momentum will last and whether agriculture’s champions in the continent can use that momentum to develop more coherent and more sustainable agricultural development strategies.\textsuperscript{11}

Notes

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2. Note, however, that GDP data is biased by the omission of the informal economy, which seems to be predominantly in the nonfarm sector. For example, despite no economic growth over 1960–2000, Nigeria appears to have experienced a large exodus of workers out of agriculture, but relatively little decline in agriculture’s share in GDP. Much of this could be attributed to the informal sector. See Headey, Bezemer, and Hazell (2008) for further discussion.

3. Other developing regions are also of interest, although the Middle East and North Africa and most Latin American countries generally started form higher income levels. However, many of these countries appear to have urbanized very quickly. Whilst comparisons between Latin America 30 or 40 years ago and Africa today would make for interesting research, in this paper we focus on the starker contrast between Africa and developing Asia.

4. South Korea is not included: it did not follow the standard Asian path in that it urbanized very quickly, partly because of a weaker nonfarm sector relative to comparable countries such as Taiwan (Otsuka 2007).

5. We also note that Nigerian data is complicated by the high rates of unemployment reported in both urban and rural areas (above 20 percent). We have allocated unemployment according to the nonfarm shares of the remaining categories.

6. An obvious caveat to this concern is that supply begets its own demand. However, Asia’s growth model has heavily relied on external demand, which is not inelastic. Moreover, the least developed Asian countries are facing a challenge that previous Asian Tigers did not encounter because the latter tended to grow in sequential phases with quite complementary shifts in economic structures—the so called ‘flying geese’ phenomenon—and among them only Japan could truly be called populous by Asian standards. In contrast developing Asia is now characterized by a large number of countries—China, India, Indonesia, Pakistan, Vietnam, Bangladesh—that are highly populous, at similar stages of development, and all in need of significant job creation outside of agriculture.

7. Specifically we assume a two-sector economy with agriculture (A) and nonagriculture (N). By definition, the annual growth in employment ($g^E$) equals the annual growth rates in output of agriculture ($g^A$) and nonagriculture ($g^N$), multiplied by their initial employment shares ($s^A$, $s^N$), and
their (full) employment elasticities with respect to output ($\varepsilon^A = 0.5$; $\varepsilon^N = 0.3$). Rearranging this identity, we can derive the nonagricultural growth required to achieve full employment based on three key characteristics of the economy: (1) the relative labor intensities of agriculture and nonagriculture; (2) the share of agricultural employment ($=70$ percent); and (3) the agricultural growth rate (which is set equal to population growth rate, assumed to be 2.9 percent). The full employment nonagricultural growth rate is then given by:

$$ g^N = \frac{(g^I - s^A \varepsilon^A g^I)}{s^N \varepsilon^N}. $$

8. Of course this statement ignores the role of linkages. It is possible that exogenously determined oil revenue might have caused increased demand for agricultural produce or increased prices, hence stimulating agriculture. But it is difficult to imagine that when industry grows by 25 percent, it causes agriculture to grow by 50 percent, implying a multiplier of two.

9. Much of the quantitative evidence on expenditure effectiveness relates to budgetary measures, such as the ratio of actual expenditures to planned expenditures for various ministries. By this measure public expenditure reviews in Africa typically reveal that ministries of agriculture fair poorly relative to many other key ministries such as health and education. See Headey, Benson, and Kolavalli (2009) for some discussion.

10. Background research on agricultural ministries for the 2008 WDR was conducted by Regina Birner and colleagues at the International Food Policy Research Institute, but these authors could not find a single example of a reformed agricultural ministry that was widely regarded as a success story (personal communication). This state of affairs is reflected in the common joke that if you removed the agricultural ministry, the rural population wouldn’t notice—and vice versa.

11. For a number of examples of recent work on agricultural strategies in Africa see International Food Policy Research Institute’s (IFPRI) publications homepage (http://www.ifpri.org/pubs/pubs.htm), the World Bank’s Agricultural and Rural Development website, as well as the recent review of Ethiopia’s Agricultural Demand-Led Industrialization (ADLI) strategy by Dercon and colleagues, summarized in Dercon and Zeitlin (2009).

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