

Chapter 9 Moving beyond the farm

Rural areas across most of the developing world face a formidable employment challenge. Even with migration to cities, rural populations continue to grow, sometimes very rapidly, as in Sub-Saharan Africa and South Asia. Each year's addition to the rural labor force needs to find work in agriculture or the rural nonfarm economy, or to migrate to the urban economy.

The rural labor market offers employment in the agricultural and nonagricultural sectors to skilled and unskilled labor, in self-employment and wage labor. Agriculture employs many wage workers—20 percent of the sector's labor force. The dynamic high-value crop and livestock sector is labor intensive with good potential for employment growth. Yet labor conditions in agriculture are not always conducive to large welfare improvements, in part because of the nature of the production process and in part because of a lack of appropriate regulation. Rural nonfarm work is increasing rapidly and includes numerous low-productivity commercial activities in thin local markets. But dynamic nonagricultural subsectors, linked to agriculture or the urban economy, offer opportunities for skilled workers.

Wages in agriculture are low, lower on average than in the other sectors. This difference is largely a result of the skill composition of workers. Unskilled workers in low-productivity self-employment in the rural nonfarm economy also garner very low earnings. Educated workers find high-paying jobs, locally or in secondary cities.

With labor as the main asset of the poor, landless and near-landless households have to sell their labor in farm and nonfarm activities or leave rural areas. Making the rural labor market a more effective pathway out of poverty is thus a major policy challenge that remains poorly understood and sorely neglected in policy making.

An active policy agenda for the rural labor market, in agriculture and in other sectors, can produce long-term sustained reductions in rural poverty. Perhaps most important is a better rural investment climate for agriculture and the rural nonfarm economy. Improving it will not be enough, however. Investments in schooling and training to convert unskilled to skilled labor are essential. Skilled workers can take advantage of better local opportunities or migrate. For those who cannot, only social protection can ease their poverty.

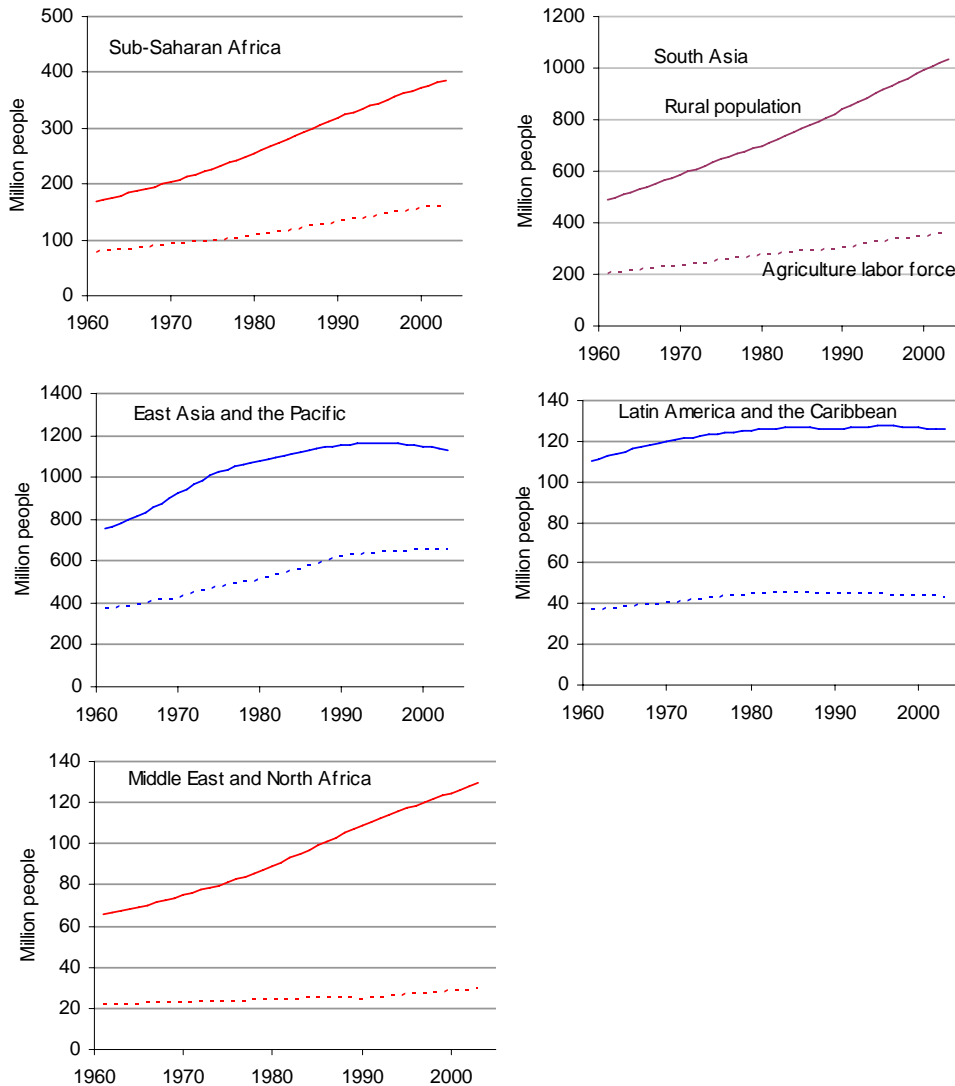
Rural employment: a daunting challenge

In India the rural labor force still grows at 1.5 percent a year, adding 4 million new workers annually. In Bangladesh 1 million people join the rural workforce every year. Millions of workers already employed in rural areas are trapped in low-earning jobs.

The gap between the number of new rural workers and the number of new jobs in agriculture is growing in Sub-Saharan Africa, South Asia, and the Middle East and North Africa—and it remains wide in the other regions (figure 9.1). Improvements in

agricultural productivity can still generate more and better jobs in most developing countries. However, because of the low elasticity of demand for food, the agricultural labor force will in the long run decline, not only relatively but also absolutely, as is already happening in Latin America and the Caribbean, and in Europe and Central Asia. Agricultural advances alone will not meet the rural employment challenge. The rural nonfarm economy will also have to be a key source of new jobs.

Figure 9.1 Agriculture is not enough to absorb new rural workers.



Source: FAO (2006a).

Note: Because data on the rural labor force are not available, growth in the rural population is used as a proxy for growth in the rural labor force.

The diversity of activities in rural areas leads to a corresponding diversification in income sources (table 9.1). In most countries, nonagricultural activities account for 30 percent to 50 percent of incomes in rural areas. As reported in chapter 3, however, this does not

necessarily mean that individual households have diverse sources of income, only that households differ in those sources.

Table 9.1 The rural economy's diverse sources of income

	Income shares				
	Agricultural income		Nonagricultural income		Transfers and others
	Self-employed	Wage	Wage	Self-employed	
Ethiopia 1999	0.74		0.03 ^b	0.05	0.18
Ghana 1998 ^a	0.55	0.02	0.15	0.22	0.05
Malawi 2004 ^a	0.67	0.08	0.12	0.10	0.04
Nigeria 2004 ^a	0.55	0.13	0.19	0.12	0.01
Zambia 2003	0.65		0.06 ^b	0.10	0.17
Ecuador 1998 ^a	0.29	0.18	0.25	0.24	0.04
El Salvador 2001	0.17	0.09	0.32	0.23	0.18
Guatemala 2000 ^a	0.25	0.22	0.21	0.14	0.19
Nicaragua 2001 ^a	0.22	0.21	0.31	0.17	0.10
Panama 2003 ^a	0.13	0.15	0.44	0.16	0.12
Peru 1997	0.49	0.07		0.44 ^b	n.a.
Bangladesh 2000 ^a	0.15	0.13	0.21	0.22	0.29
Nepal 1996 ^a	0.35	0.18	0.19	0.15	0.14
Pakistan 2001 ^a	0.43	0.06	0.24	0.12	0.17
Indonesia 2000 ^a	0.17	0.09	0.34	0.23	0.16
Vietnam 1998 ^a	0.35	0.04	0.08	0.49	0.04
Azerbaijan 2001	0.53		0.27 ^b		0.20
Albania 2005 ^a	0.29	0.04	0.25	0.21	0.23
Bulgaria 2001 ^a	0.18	0.18	0.19	0	0.45
Kyrgyzstan 1998	0.42		0.20 ^b	0.09	0.30

Sources: World Bank (2005p) for Zambia, World Bank (2005n) for Ethiopia, World Bank (2003e) for Kyrgyzstan, World Bank (2003a) for Azerbaijan, World Bank (2005k) for El Salvador, Escobal (2001) for Peru, Davis and others (2007) for the remaining countries.

a. Using comparable methodology for computing incomes (see box 3.1).

b. May include agricultural wages.

The structure of rural employment shows striking differences across developing regions (table 9.2). Off-farm work in agriculture and nonagriculture employs 47 percent to 49 percent of adult males in Latin America and the Caribbean, South Asia, and in the Middle East and North Africa, and 38 percent in East Asia and the Pacific.¹ In Sub-Saharan Africa, it employs 20 percent of adult males.

Off-farm work is also important for women, employing 25 percent of rural adult females in East Asia and the Pacific, Europe and Central Asia, and Latin America and the Caribbean. In South Asia, 11 percent of women participate in the agricultural wage labor market, but even fewer work in rural nonfarm activities. This contrasts with East Asia and the Pacific and Latin America and the Caribbean, where women participate less often in the agricultural wage labor market and more in the rural nonfarm economy. In Sub-Saharan Africa, statistics from national surveys report low female wage labor, but the

emerging literature suggests that many women, particularly poor women, rely increasingly on agricultural wage labor.² The supply of female labor is both a household decision and a determinant of the household's balance of power.³ Changing the balance of power as women enter the labor force in turn changes the household's decision. A traditional society in which women do not work outside the home can remain that way for a long time, even as conditions outside the household, such as female wages, are changing. But once women start working, the change can be very rapid, with lots of women coming out of their homes to be active in the labor market. This suggests that there can be high payoffs to one-time interventions by governments or nongovernmental organizations that assist women's entry into the labor force: once it has started, it will stick as a new self-fulfilling pattern has been established.

Table 9.2 Rural employment by sector of activity, selected countries

Sector of activity	Sub-Saharan Africa	South Asia	East Asia and the Pacific (excl. China)	Europe and Central Asia	Middle East and North Africa	Latin America and the Caribbean
Men						
Agriculture, self-employed	56.6	33.1	46.8	8.5	24.6	38.4
Agriculture, wage earner	4.0	21.8	9.4	10.1	9.4	20.9
Nonagriculture, self-employed	6.9	11.8	11.5	7.4	8.8	9.2
Nonagriculture, wage earner	8.6	15.4	17.4	31.3	30.9	17.2
Nonactive or nonreported	21.7	14.6	14.4	27.5	26.0	13.4
Women						
Agriculture, self-employed	53.5	12.7	38.4	6.9	38.6	22.8
Agriculture, wage earner	1.4	11.4	5.7	5.4	1.0	2.3
Nonagriculture, self-employed	6.8	2.9	11.3	1.6	2.8	11.7
Nonagriculture, wage earner	2.8	2.7	8.4	18.1	3.9	11.5
Nonactive or nonreported	32.7	64.3	35.5	46.9	53.3	51.2

Source: WDR 2008 team.

Note: Data are for 2000 or the nearest year. Based on representative household surveys for 66 countries, which accounts for 55 percent of the population in Sub-Saharan Africa, 97 percent in South Asia, 66 percent in East Asia and the Pacific (excluding China), 74 percent in Europe and Central Asia, 47 percent in the Middle East and North Africa, 85 percent in Latin America and the Caribbean. (See chapter 3, figure 3.4 for the methodology and the list of countries.)

Agricultural wage employment

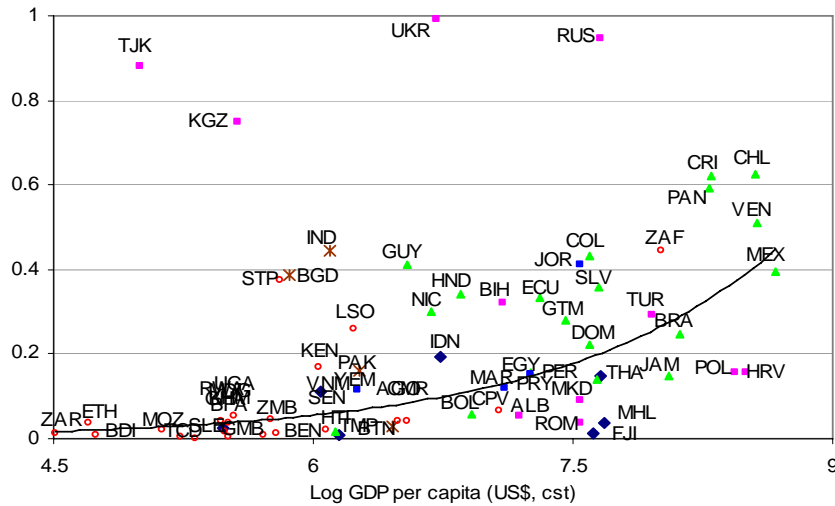
Agriculture is a large and growing employer of wage labor

Assessing the correct number of paid workers in agriculture is difficult because in many contexts agricultural wages complement self-employment. Labor Force Survey and Population Census data that classify workers by their main activity typically miss large

numbers of casual wage earners. In rural Africa, for example, recent small studies suggest that participation in the agricultural labor market is far greater than large-scale household surveys suggest,⁴ with agricultural wage employment particularly important for poor and relatively landless households. Data from all regions suggest a positive correlation between national per capita income and wage labor's share in agricultural employment (figure 9.2).

Those regional aggregates hide wide differences across countries. In Bolivia and Peru, wage labor accounts for less than 15 percent of the agricultural labor force. In Chile and Costa Rica, by contrast, wage earners predominate, exceeding 60 percent. In India, more than 100 million workers, almost half the agricultural labor force, are in agricultural wage employment.⁵

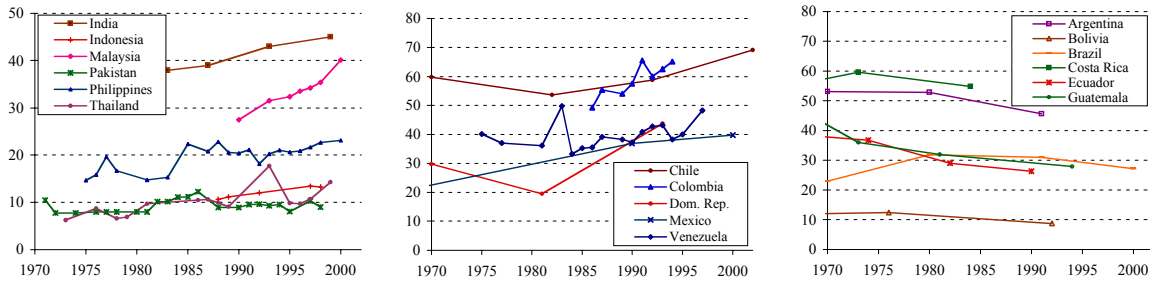
Figure 9.2 The share of wage workers in agricultural employment rises with per capita income.



Sources: WDR 2008 team; World Bank (2006z).
 Note: Same as for table 9.2.

The number of agricultural wage workers, and their share in the agricultural labor force, is growing in most regions (figure 9.3).⁶ In India, the proportion of wage workers increased from 42 percent to 47 percent from 1987/88 to 1993/94, with little change since then.⁷ In contrast, the share of wage labor does seem to be falling in some Latin American countries. In Brazil this has been attributed to the prevalence of informal labor contracts.⁸

Figure 9.3 The share of wage labor in agricultural employment is rising in many countries.

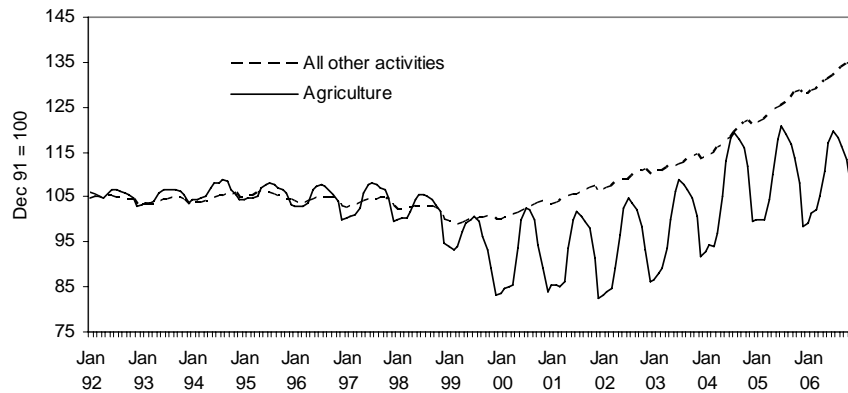


Sources: Census data (Argentina, Bolivia, Brazil, Chile, Costa Rica, Dominican Republic, Ecuador, Guatemala, Mexico); Labor Force Surveys (Colombia, Indonesia, Malaysia, Philippines, Pakistan, Thailand, Venezuela) from the International Labour Organization Web site at <http://www.ilo.org>. NSS data reported in Glinkskaya and Jalan (2005).

The nature of agriculture affects labor demand and contracts

Several factors unique to agriculture—including seasonality, agricultural production risks, and agency problems—affect the demand for agricultural labor. In Brazilian agriculture, the seasonality of formal employment has increased since 1999 to reach a variation of more than 20 percent within a year (figure 9.4). In Chile, average daily earnings for workers in the fruit industry vary 50–60 percent from the peak season to the slack.⁹ There, men more involved in field operations tend to remain in the labor force throughout the year, but women’s participation, which is more linked to processing the harvest, drops by nearly 30 percent from the peak to slack season. Moreover, females remaining in the labor force have high rates of unemployment, exceeding 50 percent on a daily basis during the slack season.

Figure 9.4 Formal employment in Brazilian agriculture has become more cyclical.



Source: Carneiro (2003), updated.

Agricultural production is also subject to droughts, floods, pests, and price fluctuations. These shocks (even if insured) affect labor demand and supply in ways that exacerbate each other. The demand for labor declines. The supply of labor by small farmers increases to compensate for the shortfall in on-farm profit.¹⁰ Consequently, wages vary

sharply with weather conditions and other agricultural risks. In Bangladesh, the real agricultural wage fell by 50 percent during the 1974 drought year. In India, an analysis of 257 districts from 1956 to 1987 shows wages are very sensitive to rainfall shocks. Wages responded less in areas with better developed financial services and better access to other markets, where laborers could find work.¹¹

Agriculture by nature makes supervising contracts difficult. Without significant monitoring, it is difficult to observe labor effort or to infer effort from observed output. To overcome this agency problem, various contractual arrangements arise to create appropriate work incentives for laborers. One is to offer piece-rate wages rather than daily wages for harvest tasks. Research has shown that workers do supply more effort under piece-rate schemes than when working for daily wages.¹² But piece-rate wages also mean that wage incomes vary across workers based on their ability to supply work effort; workers with poor physical conditions earn less.

In dynamic regions, however, rising opportunities in the nonfarm sector have raised the costs of long-term labor contracts, reducing their prevalence. India has witnessed a considerable decline in the number of permanent workers; the majority of agricultural wage employment is now casual. The proportion of casual workers increased from 65 percent in 1972 to 80 percent in 2002 among male wage earners, and from 89 percent to 92 percent among female.¹³ Casual workers are among the most vulnerable. In India their incidence of poverty reached 49 percent in 1993/94, almost three times the 17 percent for permanent workers.¹⁴

Working conditions in agriculture are particularly unfavorable

Agricultural wage workers face significant occupational, safety, and environmental hazards, rarely covered under labor protection.¹⁵ They are also poorly protected by national labor laws. Agriculture is often excluded from labor legislation, as most labor laws target industrial employment. Even when laws are on the books, low familiarity by employers and workers and poor enforcement undermine compliance in rural areas.

Working conditions in agriculture can be hazardous. According to the International Labour Organization (ILO), agriculture is one of the three most dangerous occupations, with mining and construction. About half the estimated 355,000 annual on-the-job fatalities occur in agriculture.¹⁶ Agricultural wage workers face exposure to toxic pesticides, livestock-transmitted diseases, and dangerous machinery, but they lack adequate training and protective equipment. Casual workers often receive even less training and instruction and have a greater risk of injury or death. Because working and living conditions are often inseparable in rural environments, exposure to pesticides extends beyond work periods and to the rest of the household (see Focus H on health).

Balancing flexibility in hiring for employers and basic protections for laborers has been elusive. In Brazil, labor legislation applies to both urban and rural markets, and both are subject to the same labor code. In the 1990s workers were asked to make direct contributions to social security, 36 percent of their take-home pay. Although the

additional contribution included payments that would benefit workers directly—such as a 13th month’s pay, paid minimum vacation times, and severance pay—workers perceived a large part of this tax as having less value than the cost. So, informal cooperatives for temporary jobs proliferated, with cooperative members giving up their benefits in return for higher take-home pay and in-kind payments.¹⁷

Labor contracting schemes can reduce the volatility of employment for agricultural workers, but the employment practices would benefit from more regulation. Unregulated contractors can take advantage of workers by deducting commissions; holding back wages; imposing debt bondage; and overcharging for transportation, housing, and food.¹⁸

Adapting labor regulations to the conditions of farm and rural employment

Should labor regulations treat employment in agriculture and rural nonfarm activities differently? The *World Development Report 2005* emphasized that onerous regulations hurt vulnerable groups. It argued that the main aim of policies in the labor code should be to benefit workers, especially the poor, and to generate more employment, whether formal or informal, for the less skilled. As a secondary aim, labor regulations should be consistent with incorporating a larger share of workers into the formal sector, which provides better worker protection, a pension, and health security; improves connections to credit markets; and fosters long-term investments by firms in workers through on-the-job training. The policy challenge is to encourage formality while maintaining flexibility.

Labor market regulations, particularly in middle-income countries, can unwittingly reduce employment demand and encourage informality by imposing high minimum wages, high severance payments, and an “implicit labor tax”—the wedge between what the employer pays and what the worker perceives as his true benefits. For example, in Brazil, Mexico, Nicaragua, and Poland, there is a heavy implicit labor tax on rural labor associated with crossing from informal to formal employment.¹⁹

Also driving employers and workers to meet in the informal market are legal lower bounds on formal wages. Minimum wages, to the extent that they are binding, depress the formal employment of low- and marginal-productivity workers—the unskilled and young—and this might have different effects in urban and rural markets. For example, in Nicaragua minimum wages are binding in every sector of the economy, except perhaps government employment, but the formal employment of rural and agricultural labor is particularly affected.²⁰ Evidence shows that minimum wages are set too high relative to the overall distribution of earnings. In response, low- and marginal-productivity workers take to the informal sector because businesses operating in the formal sector are likely to abide by minimum wage laws.

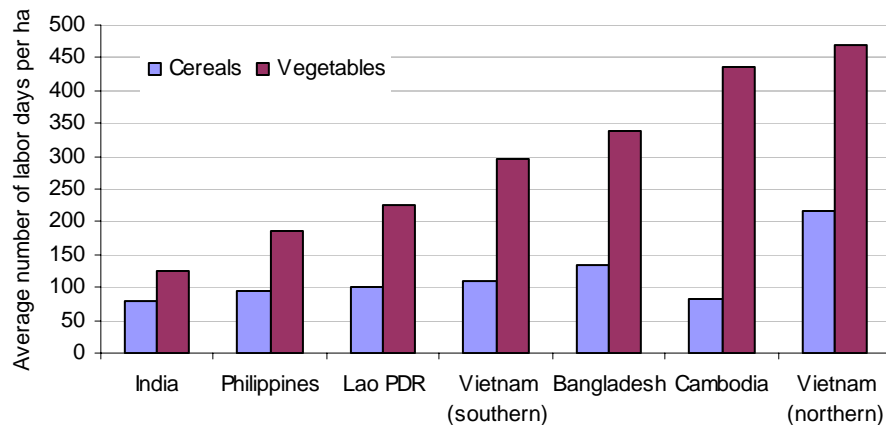
Sources of employment in agriculture are changing with the high-value revolution

Stimulating employment growth in agriculture remains a high priority in countries with a large agricultural sector. The Asian green revolution initially stimulated the demand for labor and reduced poverty through year-round employment and higher real wages.²¹

However, direct seeding, tractors, and threshers led to a subsequent decline in agricultural employment in India and the Philippines. The high-value revolution is creating a second wave of employment growth. Horticulture, livestock, and other high-value activities offer considerable potential for employment generation and productivity growth (box 9.1). For example, vegetable production can require up to five times more labor than cereals (figure 9.5). In Mexico tomato production requires 122 days of labor per hectare, four times the 29 days per hectare for maize. Similar examples can be found in Peru’s asparagus exports and Chile’s fruit exports.²²

This high-value revolution and export expansion are also changing the structure of employment in agriculture. In Chile the reforms of the 1970s were accompanied by an increase in agricultural wage workers to 68 percent of the agricultural workforce, a percentage that has been rising since 1990 and currently exceeds that for wage workers in the nonagricultural economy. The proportion and rate of increase of wage workers in the agricultural labor force are highest in regions enjoying the export-oriented horticultural boom. In contrast, areas with greater emphasis on traditional activities (wheat, dairy, and beef) have experienced a decline in the number of wage workers since 1990.²³

Figure 9.5 Labor requirements are considerably higher for vegetables than for cereals.



Source: Weinberger and Lumpkin (2005).

Box 9.1 Horticulture development in Maharashtra

In India the Maharashtra Horticulture Development Program generated employment by diversifying agriculture into horticulture and high-value crops. It provided 100 percent wage and material-input subsidies to marginal and small farmers, scheduled caste, scheduled tribes, and other ethnic minorities. All other farmers received subsidies of 100 percent for wages and 75 percent for material inputs. Other public investments included more than 150 nurseries for high-quality planting materials, an informational Web site, a Pune-Mumbai expressway, and airport and port facility upgrades. The infrastructure developments made the Maharashtra products competitive both domestically and internationally. The private sector also contributed more than 1,600 nurseries; supplied fertilizer, agrochemicals, and improved seeds; and invested in marketing infrastructure.

From 1996 to 2006, the program created roughly 213 million person-days of work, or 807,000 person-years. From 1989 to 2001, it accounted for 96 percent of the increased area planted to fruits in Maharashtra. More permanent full-time employment was created to fill the year-round labor requirement

of fruit orchard operations. Demand for labor was increased throughout Maharashtra in the complementary areas of transport, packaging, and storage.

Source: World Bank (2003c).

Rising rural nonfarm employment

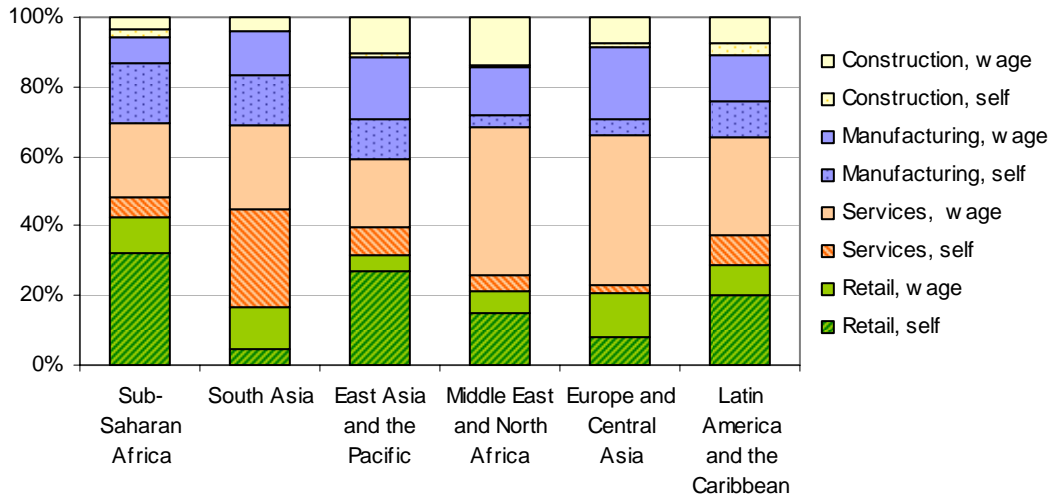
Agriculture remains the backbone of most rural economies, but rural employment is diversifying out of agriculture (see table 9.1). In some Latin American countries, rural nonagricultural activities grew at more than 10 percent a year between 1980 and the early 2000s. In Chile, they rose from 25 percent of total rural employment in 1960 to 49 percent by 2002, and in Brazil from 14 percent to 31 percent.²⁴ Indonesia went through a period of rapid growth in the nonfarm share of rural employment prior to the 1997 financial crisis (from 30 percent in 1990 to 40 percent in 1995), before falling to 32 percent in 2003. In Bangladesh, nonfarm rural employment increased at a 0.7 percent annual rate during the 1990s while agricultural employment increased at 0.1 percent.²⁵

Nonfarm employment tends to be more important for women than for men in Latin America (see table 9.2). In Chile in 1960, female employment represented more than 20 percent of all nonfarm employment, four times their share in agricultural employment. By 2002 the shares had risen to 30 percent for nonagriculture and 7 percent for agriculture. In contrast, nongricultural employment favors males in Sub-Saharan Africa, East Asia and the Pacific, and particularly South Asia, where trends in female employment are affected by the opportunities available to males in the household. As men move into nonfarm work, women meet the demand for agricultural labor, resulting in the feminization of the agricultural workforce.²⁶

Rural nonfarm enterprises are mainly for self-employment, focused on trade

Retail trade and services account for 60 percent to 75 percent of nonfarm wage employment across regions (figure 9.6). Retail trade is predominantly self-employment, and services are mostly wage employment. The manufacturing sector is generally small, confined primarily to agroprocessing, but it grows as nonfarm rural activities thicken and rural-urban links develop (chapter 1).

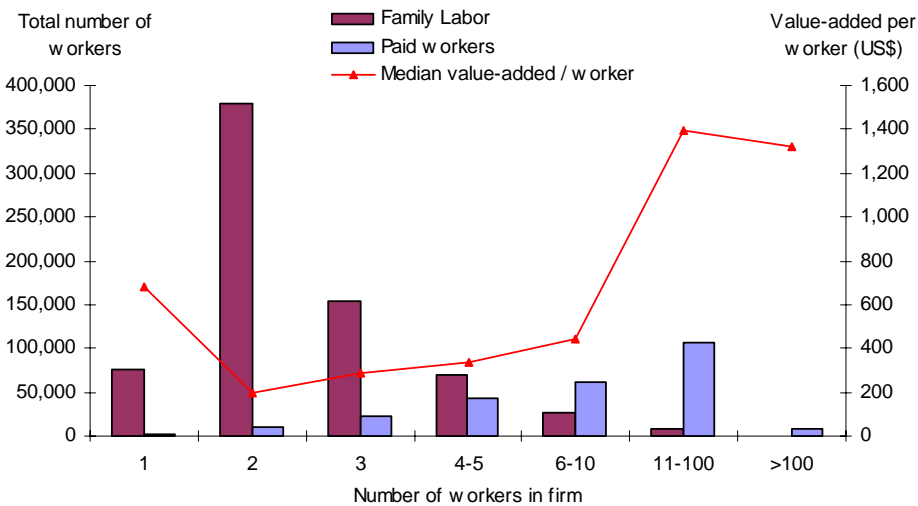
Figure 9.6 Retail trade and services dominate nonfarm wage employment.



Source: Same as for table 9.2.

Rural nonfarm enterprises are transforming the employment structure in rural areas. Most enterprises are small, with 80–90 percent relying exclusively on family labor, as illustrated by the distribution of employment in Indonesia (figure 9.7).²⁷ In Sri Lanka, the average number of workers in a rural nonfarm enterprise is 2.4, with 79 percent of firms having only one or two people. In Tanzania, 58 percent of the firms are one-person enterprises, and in Bangladesh 45 percent are. Very small size enterprises also dominate in Indonesia, Nicaragua, Pakistan, and Vietnam. Thus, to date, the employment benefits of this sector to rural wage labor are minimal compared with self-employment.

Figure 9.7 Most rural nonfarm enterprises have only one or two workers, mostly self-employed. Indonesia, 2005



Source: WDR 2008 team, using Rural Investment Climate Assessment data.

The rural investment climate reveals the main constraints on enterprises

The rural economy offers benefits to investors in some areas because of the low cost of labor and land and the reduced congestion. But Rural Investment Climate Assessments also reveal significant constraints on investment.²⁸ Among them are poor access to credit and its high cost, inadequate supplies of electricity, poor-quality roads and infrastructure, and the significant operating costs associated with the move from informal to larger formal enterprises. The investment climate is also hurt by weak governance structures in rural areas and by the lack of well-functioning legal institutions.

Another major constraint appears to be low market demand, a consequence of the essentially local market facing rural enterprises. The lack of demand for goods and services is perceived as the major constraint in Indonesia and Vietnam, and as the second major constraint in Pakistan. Most businesses buy and sell locally, with little access to outside markets. In Tanzania, Nicaragua, and Pakistan, more than 70 percent sell their product in the same locale. In Nicaragua, 73 percent of the input purchases are in the firm's community. Consequently, rural nonfarm enterprises perform better in densely populated areas, where demand is higher.

Addressing these constraints poses dilemmas. If demand is very local, additional production induced by greater access to finance and lower costs of capital will reduce prices, undermining profit and reinforcing the intense competition in these crowded markets. Expanding markets by linking the nonfarm sector to the larger economy is thus essential for developing the rural nonfarm economy. Infrastructure improvements can both reduce input costs and open larger markets for local enterprises (chapter 5). But improving infrastructure is likely to produce winners that will thrive in the larger environment and losers that can't compete.

The dependence of nonfarm enterprises on local markets links their profitability to local agricultural conditions. So, the same factors that constrain agricultural demand also constrain the growth of the rural nonfarm sector. The low employment in agroprocessing in all countries surveyed suggests that the forward links between agriculture and the nonfarm sector are not as large as they could be.

The young age of enterprises is another concern: a third of them have less than two years of operation, and a half of them have less than three. This young age can reflect a dynamic rate of enterprise creation—or a high rate of business failure. In Vietnam the annual survival rate of household nonfarm enterprises is estimated at 83 percent. An average household enterprise thus has a 17 percent chance of not being in operation one year later and a 45 percent chance of failure within three years. Successful approaches to the development of nonfarm enterprises, such as that pioneered by the Self-Employed Women's Association in India, reveal the broad support needed to help microentrepreneurs succeed (box 9.2).

Box 9.2 Women’s cooperative in India

The Self-Employed Women’s Association (SEWA) was formed in 1972 in Ahmedabad. Initially a small membership organization for poor women working in the informal sector, SEWA now has more than 1.2 million members across India.

Members are involved in SEWA through unions or cooperatives. The unions, in both urban and rural areas, help members gain access to fair treatment, justice, markets, and services. The cooperatives help members market and improve the quality of their products while teaching them new techniques and how to expand into new products. For example, SEWA has shown salt farmers how to produce higher-value industrial salt rather than lower-value edible salt.

The largest cooperative is the SEWA Bank. In 2004 the bank had more than 250,000 accounts, with deposits totaling \$14.4 million. It has encouraged thousands of poor women to regularly save their incomes through programs such as “doorstep banking” and offered small loans that averaged \$73. Members prefer the bank’s 20 percent interest rate to the exploitation of moneylenders.

Source: World Bank (2006i).

Generating more rural employment opportunities, on and off the farm

The demand for labor, even for low-wage workers, will not increase without a dynamic rural economy in both agriculture and the nonfarm sector. Perhaps the most basic policy element for a dynamic rural economy is a good investment climate. To improve the investment climate, governments can secure property rights; invest in roads, electricity, and other infrastructure; remove price interventions adverse to rural products; develop innovative approaches to credit and financial services; and aid in the coordination of private and public actors to encourage agro-based industry clusters.

With more investment and the expansion of rural economic activities comes the potential for higher-paying jobs, particularly off the farm. On the farm, productivity-enhancing technologies can boost incomes. With the poorest most likely to remain in agriculture, increasing wages for agricultural workers offers the greatest potential to lift millions out of poverty, particularly in Africa.

Improvements in the investment climate (especially ones that generate rural nonfarm jobs) are easiest in areas with higher population densities (lower-cost infrastructure) and larger natural resource endowments (agriculturally generated businesses). This applies to both farm and nonfarm jobs. But many areas lack these conditions, so interventions should be adjusted to accommodate differences. For less-favorable regions, the menu of interventions is limited, especially with small government budgets. Public investments in infrastructure are critical. Moreover, business services, tax incentives, and developmental subsidies (such as the forest and soil fertility subsidies in Chile) could prod private entrepreneurs to invest in new ventures.

Enhancing the dynamics of rural economies can also be approached from a territorial perspective. This approach includes the promotion of local agro-based clusters where agricultural producers and agroindustries in a specialized activity interact to better compete. The Petrolina-Juazeiro region of Brazil’s San Francisco Valley shows how dynamic clusters can create links with local services and industries and enhance the

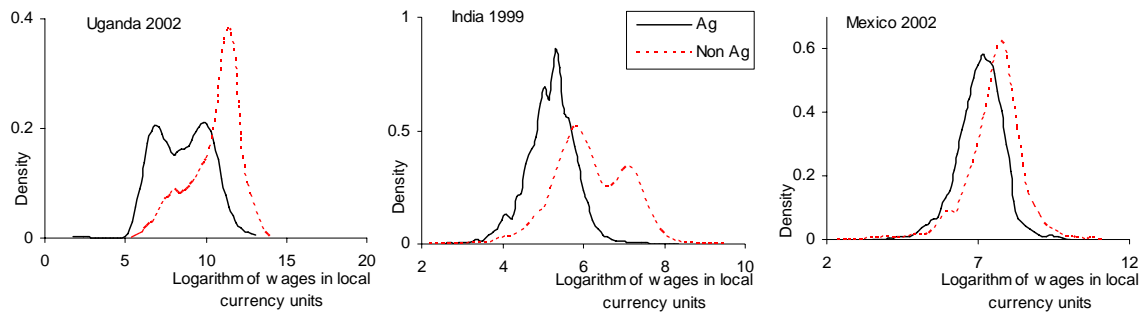
demand for labor beyond farming. There, investment in irrigation and cooperation between commercial entrepreneurs and land reform beneficiaries in the production and marketing of high-value export crops produced large direct benefits for participating smallholders, a massive expansion of employment in agriculture and agriculture-related industries and services, wage gains based on strong bargaining power of labor unions, and sharp reductions in poverty.²⁹ Successful territorial development points to having innovation as a driver of local growth, as well as enhancing local spillovers by increasing access to dynamic markets and strengthening links among farmers, industry, and services.

Wages and earnings in the rural labor market

Wages are higher in the rural nonfarm sector than in agriculture, mostly because of skill differences

Wages are considerably higher in rural nonfarm employment than in agricultural wage employment (figure 9.8). In Mexico the average wage in nonagriculture is 56 percent higher than in agriculture. Both sectors frequently exhibit a bimodal distribution, revealing dualism.

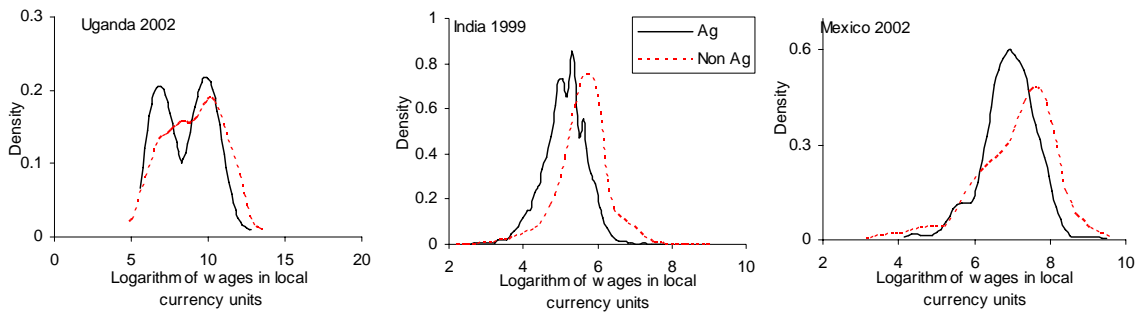
Figure 9.8 Wages are much higher in rural nonfarm employment in India, Mexico, and Uganda.



Source: Same as for table 9.2.

How much of this wage difference simply reflects the fact that lower-skill workers take agricultural jobs? For unskilled workers (defined as workers with no schooling), much of the difference in distribution is eliminated, especially in Uganda and India (figure 9.9). Even the remaining difference in wage distribution cannot prove any fundamental sectoral difference in labor compensation, because workers choose their sector of activity and in so doing may select that sector according to other skills not captured by education.

Figure 9.9 For workers with no education, wages in agricultural and rural nonfarm employment are not so different across sectors.



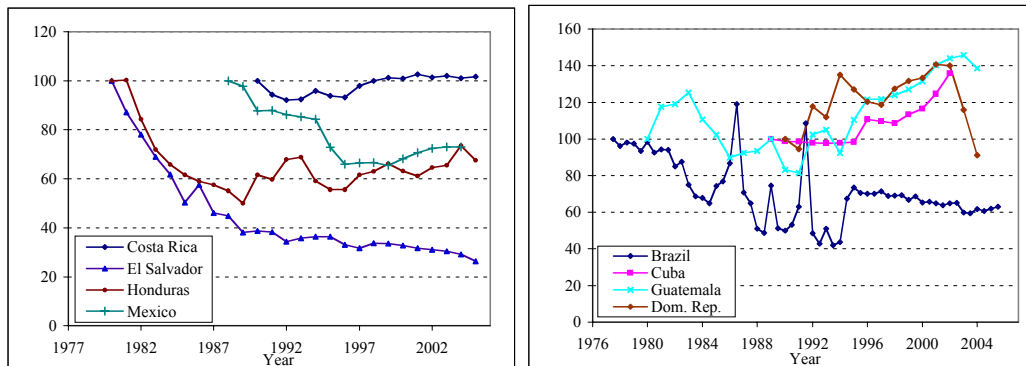
Source: Same as for table 9.2.

In the nonagricultural sector, men’s wages are higher than women’s, although the difference is small in Africa, where employment is mainly in very small firms. Female wages are more heterogeneous than male wages and tend to show a more bimodal distribution. In India the average wage for agricultural casual work is 30 percent lower for women than for men, 20 percent lower for the same task. The difference in the distribution of tasks, with men doing the better-remunerated tasks of plowing and well digging, accounts for the remaining difference between the average wages.³⁰ In Mexico, wages are lower for women with little education than for men with the same level of education. However, at higher levels of education, the distribution of wages looks very similar across genders.

Wages in agriculture have been declining in Latin America, rising in Asia

There is evidence that across many Latin American countries, agricultural wages have been declining. Temporary workers in Brazil have lost a third of their income over the last 30 years (figure 9.10). In Mexico between 1988 and 1996, temporary workers lost 30 percent of their purchasing power and have not regained it since. In contrast, real wages have increased in most Asian and African countries (figure 9.11).

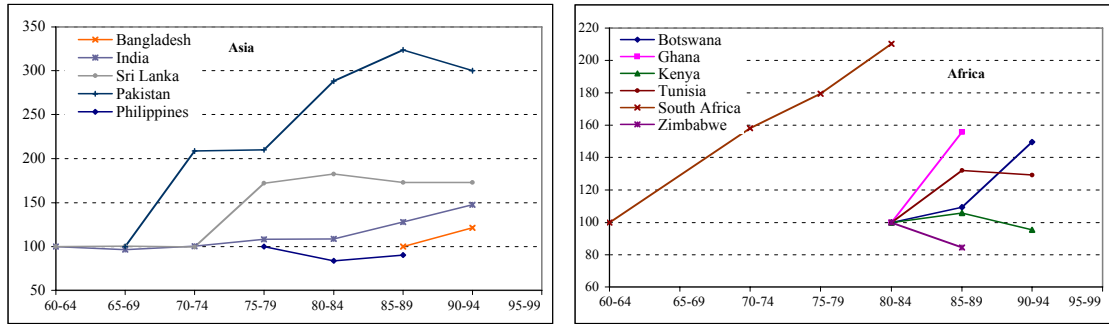
Figure 9.10 Agricultural wages have been declining in Latin America ...



Sources: Brazil: Fundação Getulio Vargas Estatísticas Agrícolas; other countries: CEPAL, Statistical Yearbook for Latin America and the Caribbean, various years.

Note: Nominal wages deflated by national consumer price index.

Figure 9.11 ... but rising in Asia and Africa.



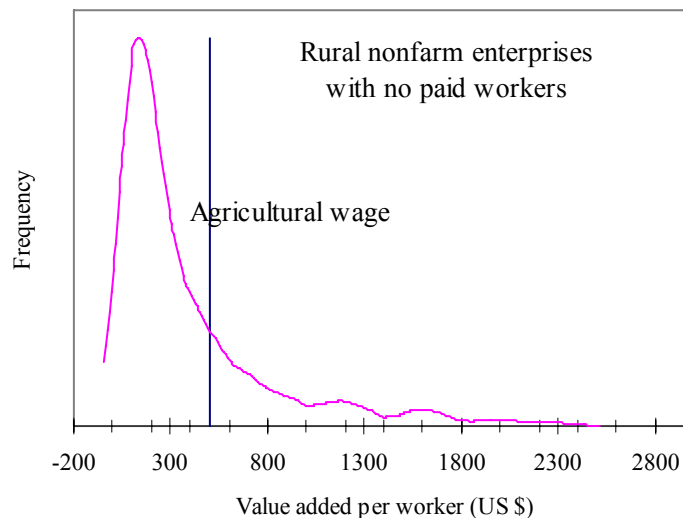
Source: Rama and Artecona (2002).

Note: Index based on male and female daily wage of casual workers, deflated by the consumer price index.

Earnings in owner-operated rural nonfarm enterprises are heterogeneous, but better-paying jobs are found in larger enterprises and in urban centers

Is self-employment in the rural nonfarm sector a refuge, disguising unemployment, or a good source of earnings? Value added per worker, a crude measure of earnings, is very heterogeneous in the nonfarm sector, and this is reflected in the distribution of labor productivity in enterprises employing only family members (figure 9.12). In Indonesia, the median annual value added per worker in these enterprises is \$230. As many as 59 percent of firms generate value added per worker below the agricultural wage. At the other end, 7 percent generate value added per worker at least five times the agricultural wage.

Figure 9.12 Labor productivity in self-employment is heterogeneous in Indonesia.



Source: World Bank (2006j).

Note: The annual agricultural wage is computed from the average village-level daily wage, multiplied by 11 months at 22 days a month.

Rural nonfarm enterprises that create employment opportunities usually exhibit higher labor productivity. In Indonesia, labor productivity in firms with more than 10 workers is \$1,400, more than six times that of the small farms with two or three workers. Workers in these larger enterprises are also more educated. More than half of them have finished secondary school, and almost none of them are without completed primary school education. Employees of these larger firms also constitute the higher peak in the wage distribution, such as that in figure 9.8. Evidence from Bangladesh also suggests that rural nonfarm enterprises do better in areas with good access to markets, infrastructure services, and education.³¹

Labor supply: migration and the urban economy

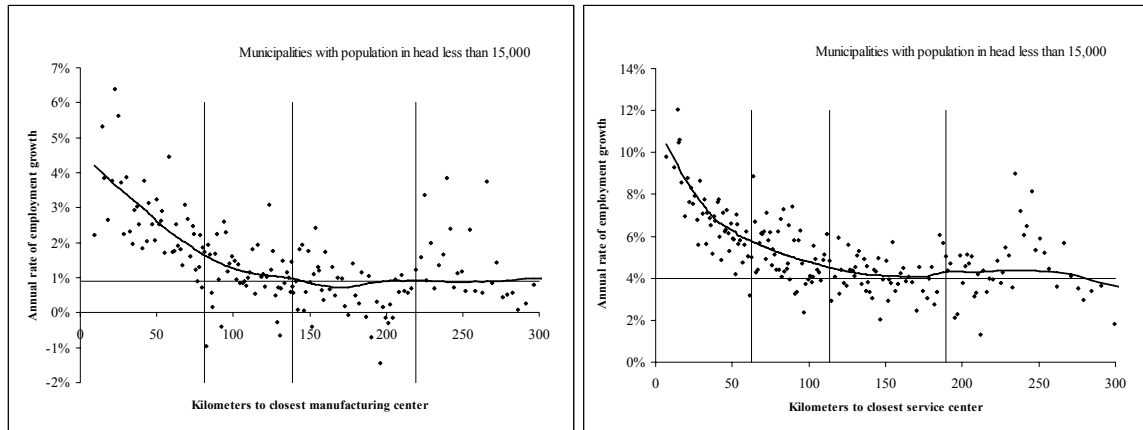
Rural labor outcomes are closely related to labor conditions in other sectors of the economy

Wages reflect labor supply and demand. On the supply side, workers are mobile, responding to market options in agriculture and in nonfarm activities, and to those in the urban economy by commuting or migrating. This mobility links sectors within rural areas, as well as the urban and rural economies. A stagnant nonagricultural sector inhibits movements out of agriculture in economies where agriculture is stagnant (as in Sub-Saharan Africa), but also in economies where agricultural productivity is high (as in Punjab, India, through the first decade of the green revolution).

The integration of the labor markets also weakens the direct correspondence between employment and earnings within each subsector. Increases in agricultural labor demand, perhaps reflecting a shift toward high-value products, may have only small effects on agricultural wages if the labor supply is highly elastic. Conversely, despite the fact that rural nonfarm enterprises are small, exhibiting little demand for wage labor, they may significantly affect labor market conditions. Any increase in nonfarm opportunities implies a potential reduction in the supply of agricultural laborers, increasing wages. So, policy measures that encourage nonfarm employment, even in small enterprises, are likely to generate spillover benefits to rural laborers.

The role of dynamic regional towns and small cities for the rural labor market cannot be overstated. Nonfarm employment in rural areas depends on the proximity to large urban centers and smaller intermediate cities. In Mexico, the dynamism of employment is stronger close to urban centers, and declines until a distance of 150 kilometers, beyond which the urban influence disappears (figure 9.13). Proximity is particularly important for manufacturing. In isolated municipalities, there is substantially more growth in the service sector than in manufacturing, as local agriculture creates a demand for local services.³² In Indonesia, even within rural areas, wage employment as a percentage of total nonfarm employment increases with village size. These results point to the role of small and intermediate urban centers as engines for growth in rural areas.

Figure 9.13 Growth of manufacturing and service employment in Mexico is a function of distance from an urban center with more than 250,000 inhabitants.



Notes: Observations are municipalities with population in main city less than 15,000.
Source: Araujo, de Janvry, and Sadoulet (2002).

Migration—with the rural nonfarm economy as a bridge

Migration to urban areas in search of higher incomes is common and a potential pathway out of poverty. It induces an upward pressure on wages in areas with high rates of out-migration.³³ This wage increase can have a positive effect on the labor force participation of nonmigrants because of the need to replace migrant workers. On the other hand, remittances can create an incentive to reduce the labor supply of nonmigrants by increasing their reservation wage. In particular, remittances can reduce the labor force participation of women in favor of home production. A study of remittances sent from Mexican migrants in the United States finds that women from high-migration states are less likely to work outside the home.³⁴ Similar evidence is found for their hours of work. However, there is no effect on men's labor force participation and hours of work.

Migration is most pervasive in the transforming and urbanized economies, where growing urban areas offer more employment opportunities (chapter 1). An estimated 575 million people migrated from rural to urban areas in developing countries over the past 25 years.³⁵ Of these, 400 million lived in transforming countries, where migration flows increased to almost 20 million a year between 2000 and 2005. Migration flows as a share of the rural population have been traditionally highest in urbanized economies, but they have fallen over 2000–05 to an annual rate of 1.25 percent. In transforming and agriculture-based economies, the annual flow of out-migration steadily increased to 0.8 percent and 0.7 percent of the rural population, respectively.

Evidence suggests that migration is most accessible for the wealthiest and best educated of the rural population, as moving requires the means to pay for transportation and education to find a good job.³⁶ Moreover, better-educated migrants are the most likely to have a successful migration outcome. In the Philippines, female migrants to urban areas fare better than the less-educated males.³⁷ In some countries, China in particular, the limited access of migrant workers to social protection in the urban environment leaves

them vulnerable to economic hardship and hinders their integration into the urban labor market. Casual work and informality persist for them.

The rural nonfarm sector can bridge rural agricultural work and more productive nonfarm employment in urban areas. Migration to small and intermediate cities may offer greater potential than larger cities for poorer rural households. In Indonesia between 1993 and 2000, the migrants to nonfarm jobs in urban areas were already doing nonfarm jobs in rural areas and tended to be among the better-off nonfarm rural workers.³⁸ Initially, less-well-off people who move relatively small distances (within a subdistrict) tend to have stronger income growth, but subsequent income gains are more limited.

Given such constraints, one of the best prospects for reducing rural poverty is the potential for rural residents to participate in the urban economy by commuting, while retaining their rural residence and their foothold in farming.³⁹ In northeast Thailand, the greater availability of nonfarm jobs in nearby cities led to significant improvements in income. Reflecting the greater integration of rural and urban labor markets, the disparity between rural and urban wages is declining in many economies. In Mexico, the rural-urban wage ratio increased from 28 percent in 1992 to 40 percent in 2002. In India, while agricultural wages remain low, there is evidence of convergence between rural nonagricultural wages for casual workers and urban wages.

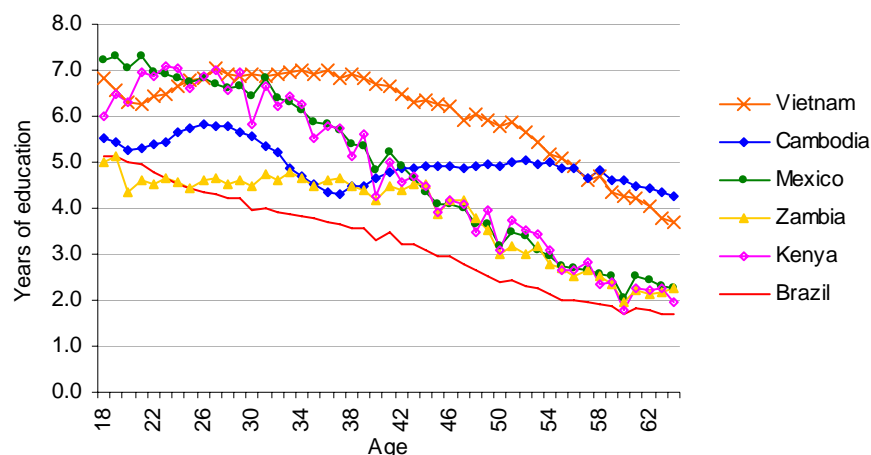
Schooling, training, and transition to the labor market

The main dividing line between high- and low-paying jobs is skill. Educated adults are more likely to have nonagricultural wage jobs and to migrate. It is the younger, better-educated, and more-skilled workers who leave the rural areas to find better income opportunities abroad or in urban areas (chapter 3). The large labor supply for agricultural jobs, largely from the inability of unskilled laborers to move into skilled employment, underlies the persistence of poverty and the inequality that emerges when skilled employment takes off outside of agriculture in transforming countries.⁴⁰

Rural areas exhibit dismal levels of education

Rural workers have less education than urban workers. Rural males have an average of four years of education in Sub-Saharan Africa, South Asia, Middle East and North Africa, and Latin America and the Caribbean, and just above six years in East Asia and the Pacific (chapter 3). These averages are two to four years less than in urban areas. Women's level of education is even lower, with averages below two years in South Asia and the Middle East and North Africa. Very high disparities in human capital are also observed between rural and urban China.⁴¹

Figure 9.14 Average years of education in rural areas, by age (18–64)



Sources: Population census data for Brazil (2000), Cambodia (1998), Kenya (1999), Mexico (2000), Vietnam (1999), and Zambia (2000).

These low averages reflect the aging of the rural population and hide progress over the last decades (figure 9.14). However, a significant rural-urban schooling gap remains in most developing countries. Even in countries that have experienced large improvements in education, such as Mexico and Kenya, the level of education among the youth in rural areas is still barely above primary school, and it is much lower in other countries (table 9.3).

Table 9.3 Average years of education of rural 18–25 year olds, selected countries

	Sub-Saharan Africa	South Asia	East Asia and the Pacific	Europe and Central Asia	Middle East and North Africa	Latin America and the Caribbean
Urban						
Men	8.5	7.3	10.1	10.6	9.3	8.7
Women	7.6	6.5	10.1	11.1	9.2	8.9
Rural						
Men	5.5	5.3	8.0	9.7	6.8	5.7
Women	4.3	3.0	7.7	10.0	5.0	5.8

Source: WDR 2008 team.

Note: Calculations of average education levels for 18–25 year olds based on 58 countries (excluding China and India) with recent household survey data with information on years of education, weighted by 2000 population. See figure 3.5.

Low levels of education in the rural labor force tend to reproduce themselves over generations—poorly schooled parents tend to have poorly schooled children, who then have fewer opportunities for higher income. Poverty may affect the ability to continue education—and so is a direct factor in reducing household investment in education. Poverty and low education thus become transmitted across generations.

Returns to education are low in agricultural employment, higher in the rural nonfarm economy and in cities

A primary determinant of these schooling gaps is the low rate of return to schooling in traditional agriculture. In Bukidnon, Philippines—where most of the employment is in harvesting and is paid piece rate—raising the level of schooling has no effect on wages.⁴² Similar results are found in many other contexts.

But as famously argued by T. W. Schultz (1969), rates of return are higher in dynamic settings, where technological change and a more complex environment require more difficult decisions. During the green revolution in India, education had higher returns in regions with higher rates of adoption of the new seeds.⁴³ In Taiwan (China), education was also more valuable for production in areas with greater weather instability.⁴⁴ Similarly, the return to schooling in rapidly growing economies is significant. For adults in Indonesia, the return to one additional year of education is estimated at 13 percent, a value close to other international estimates.⁴⁵

There is also ample evidence of a correlation between education and the access and return to nonfarm employment. In China and India, better education enables rural workers to find high-paying nonfarm employment, whereas a lack of education tends to force them into agricultural employment or low-wage nonfarm employment at best.⁴⁶ Similarly, in Ghana, Peru, and Pakistan, returns were higher in nonfarm than in farm activities.⁴⁷ Mirroring these studies, the returns to education across countries are consistently higher in urban areas than in rural markets, particularly beyond basic schooling.⁴⁸ Studies in Bolivia and Turkey also show returns to education to be higher close to urban centers, suggesting that off-farm opportunities enhance the value of schooling.

These higher returns in the nonagricultural economy will influence the schooling decisions of rural households, if the potential for employment exists. In the Philippines and Thailand, rural households invest a major portion of their additional income in schooling children who later engage in rural nonfarm jobs or migrate to cities to seek more lucrative employment.⁴⁹ In India, rural-to-urban migration significantly increases the rate of return to rural schooling at levels beyond that of middle school. Rural parents appear to know this: urban rates of return affect decisions to school their children to higher levels.⁵⁰

The low level of rural schooling may also reflect the low quality of rural schools, relative to those in urban areas.⁵¹ Rural-urban differences in school quality manifest themselves in differences in school infrastructures, which result in significant rural-urban differences in schooling achievement (see Focus G on education).

Rural labor market outcomes can be improved by active labor market programs

Active labor market programs can assist rural households in finding better employment opportunities, thus helping households transition out of poverty. A job-matching program for migrants in China provided off-farm employment to about 200,000 upland

laborers over six years, including roughly 110,000 interprovincial migrant laborers. It established a voluntary system of enhanced rural labor mobility; provided on-the-job training by enterprises (paid for through payroll deductions); and put in place a computerized, demand-driven job placement system emphasizing local markets, monitoring worker safety and living conditions, and reporting abuses and grievances. The program was extraordinarily effective in expanding the upland poor's knowledge of and access to off-farm employment. It was a very powerful poverty reduction instrument. It also improved migrants' outlooks on life and fostered greater aspirations. This was clearly so for migrant women (about one quarter of all migrant laborers); they had more self-esteem and confidence, reduced work burdens (on returning to their home villages), and greater economic independence.⁵²

A program in Andhra Pradesh provides employment options to the most vulnerable rural youth, linking them to jobs in semiurban areas or at the local level after a three-month training program with industry representatives acting as mentors. In 2005/06, this program created more than 10,000 jobs in semiurban areas, leading to incomes substantially higher than the local market could provide. At the local level, more than 5,000 jobs were created, largely in the textile industry, many for women. Linking training to placement is one key to this program's success.

Investing in education breaks the cycle of poverty

There are two sides to investing in human capital investment. For demand there is the problem of incentives for parents to invest more in their children's education. For supply there is the problem of improving the availability and quality of schooling. In practice, there is an added administrative problem: the two sides are generally managed by different ministries, one for social welfare and one for education.

The demand for schooling responds to lower costs, both in school expenses (fees, clothing, books, and the like) and the opportunity costs of traveling over poor roads to distant locations and not having children to do productive work. These costs to families can be lowered. The recent elimination of school fees for primary education in Kenya and Uganda induced major increases in school enrollment. In Uganda the free primary education program that started in 1997 had large impacts on completion rates for fourth and fifth graders from poor households, especially girls.⁵³ But free primary education may not be enough for poor children to attend school because of other costs.

Conditional cash transfers, where regular school attendance is a condition for parents to receive transfers, are expanding in many countries. After an early conditional in-kind transfer program in Bangladesh (Food-for-Education), programs have rapidly developed in such middle-income countries as Mexico (Oportunidades) and Brazil (Bolsa Familia).⁵⁴ These programs reduce current poverty through the cash transfers and reduce future poverty through greater investment in the schooling of poor children. When successful, they can be a one-generation investment in breaking the intergenerational inheritance of poverty. Although costly, these transfer programs have been successful in middle-income countries and are being put in place in many other countries. However,

adapting them to low-income countries with extensive poverty and weaker school and civil registry systems remains an unexplored challenge.

Investing in the supply of education, and balancing supply-side and demand-side investments, is necessary for raising educational achievements. In Mexico the conditional cash-transfer program was targeted at rural communities sufficiently well endowed with school facilities. Distance to school was found to be a major correlate of program uptake.⁵⁵ The next step is to extend school facilities to all rural areas. Improving the quality of schooling is also essential. A notable example is Colombia's Escuela Nueva program of community involvement, curriculum improvement, teacher training, and administration. It has a flexible schedule to accommodate rural activities, and its teacher training addresses the needs of each community. More attention to school quality could significantly increase the returns on education.

Reducing child labor

In the short term, poor families gain from child labor; thus there are short-term welfare losses to rural families from sanctions on child labor. For development, however, the biggest cost of child labor is lower future education and the persistence of long-term poverty (box 9.3). Policy proposals for reducing child labor have included restrictions and prohibitions on employment and even trade sanctions. But these sorts of policies are more likely to control wage employment for children, not unpaid family labor. Conditional cash or in-kind transfers, which enhance the returns on schooling, are fairly successful in reducing child labor.⁵⁶ In Ecuador, Bono de Desarrollo Humano reduced child work by an estimated 17 percentage points. Brazil explicitly tackles child labor in the conditions for support in its Program to Eradicate Child Labor.

Box 9.3 Child labor: pervasive in agriculture

The ILO estimated the number of child laborers at 218 million in 2004. Most help their families at home, on the farm, or in the family business—60 percent of them are in Asia, and 52 percent are boys. Although only 23 percent of the economically active children are in Sub-Saharan Africa, participation rates are highest there, an estimated 30 percent of the 5–14 year olds. Child labor can include prostitution and drug trafficking, but on a world scale these are small numbers.

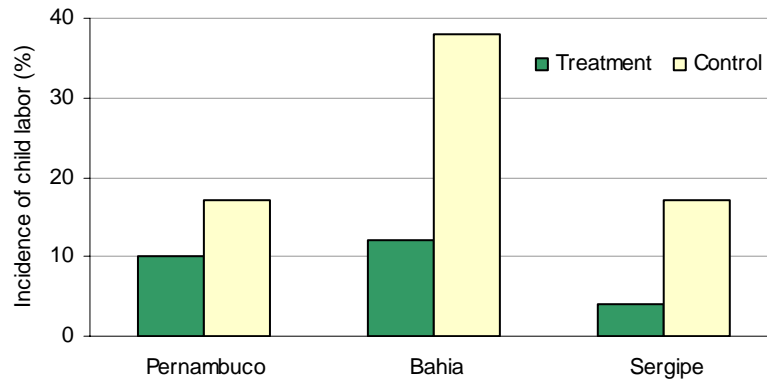
Compared with 19 percent for urban areas of developing countries, 31 percent of the children 5–14 in rural areas reported working, with 9.8 percent working outside the family business and 2.5 percent being paid.⁵⁷ Including work and domestic chores, 26 percent of rural children worked 20 or more hours per week, and 9 percent worked 40 or more hours. The prevalence of unpaid work in rural areas is nearly twice that in urban areas.

Not all child labor is harmful, and income from children's economic activities provides needed income for poor rural households. But comparisons across more than 40 countries reveal a negative association between child labor and school enrollment. In nine Latin American countries, third and fourth graders who worked longer hours outside the home performed less well in school. Evidence from Ghana, Nicaragua, and Pakistan shows similar adverse effects of work on schooling.

The poorer school performance attributable to early child labor can have permanent consequences in lower earnings. In Brazil, males who entered the workforce before age 12 earn 20 percent less per hour. Children with a parent who worked as a child are more likely to work at young ages, holding other household attributes constant. Delaying the age for children to enter the workforce thus delays labor market entry for the next generation as well.

In Brazil, the Program to Eradicate Child Labor requires that rural children attend school and that parents agree that their children will not work. The program substantially lowered the incidence of child labor in three states (figure below). In Bahia, the program reduced child labor by more than 23 percentage points.

Brazil's program to eliminate child labor



Sources: Edmonds and Pavcnink (2005); Emerson and Portela Souza (2003); Gunnarsson, Orazem, and Sedlacek (2005); Ilahi, Orazem, and Sedlacek (2005); Yap, Sedlacek, and Orazem (2001).

Providing safety nets to reduce vulnerability

Rural noncontributory pensions

The elderly and disadvantaged left behind by migration may require additional forms of income support. Brazil, Bolivia, and South Africa have rural noncontributory pensions.⁵⁸ They create welfare gains for recipients and spillover effects on the education and nutrition of family members. But they also keep firms and workers in the informal sector, and there is an additional cost in having fewer contributors and forgoing economies of scale in production.⁵⁹

Private transfers, especially remittances, can also provide income in rural areas. The sums can be huge—an estimated \$60 billion in 2006 in Latin America alone—creating a potentially large source of investment in local economies. But transaction costs of fund transfers are very high, often exceeding 20 percent. Reducing these fees by 5 percentage points could generate annual savings of \$3 billion for workers sending money home.⁶⁰ Policies should be aimed at reducing transaction costs on remittances and encouraging investment in the local economy.

Designing scalable safety nets to respond to shocks

Safety nets often target those with few assets including household labor. However, they also have an insurance function. Ideally, they increase expenditures when income or production declines.⁶¹ In many cases though, safety nets can be procyclical, because economic shocks often reduce fiscal revenues just as they call for an increase in expenditures. To counter this, safety nets need to be flexible, quick, and efficient. In both Argentina and Mexico in the mid-1990s, economic downturns reduced social

spending just when poverty was increasing. India, Mexico, and the Philippines now hold reserve funds or earmark specific taxes for their relief programs. This funding is more flexible than donor assistance, but even in this latter case, the trend is towards increased flexibility (box 9.4). In addition to responsive financing, identifying beneficiaries and disbursing funds must be rapid to remain countercyclical. To ensure smooth operation of safety nets when needs rapidly increase, programs should be in place before a shock occurs.

While there is extensive experience with targeting transfers on the basis of chronic poverty, ex post targeting to mitigate consequences of shocks requires different implementation. Given the cost of collecting indicators responsive to shocks for short-term use, programs may consider using community targeting or self-targeting. Public works and community subsidies for grains primarily consumed by the poor are examples of self-targeting. For the long term, safety nets have to be scaled back when a crisis subsides.

Box 9.4 The gradual but incomplete move toward cash-based food aid

Food aid volumes are at long-term lows, reflecting sharp reductions in regular program food aid not compensated by increases in emergency food aid shipments. Emergency aid now dominates global food aid: more than 57 percent of global food aid flows in 2001–04 were emergency aid. Emergency food aid has also ushered in a geographic shift from Asia to Africa.

Major policy changes in Australia, Canada, and the European Union illustrate that donors are now more flexible in sourcing food aid. In 1996 the European Union created the Food Security Budget Line, eliminating restrictions tying the procurement of food aid to European suppliers. A significant departure from the past, it encouraged more local and regional purchases. While local purchases can sometimes destabilize local prices, they are estimated to be 30–50 percent less expensive to procure and deliver than food shipments from donor countries.⁶² In-kind food aid and cash transfers are both open to mistargeting and corruption, but in-kind aid incurs higher distribution costs. Local purchases can facilitate faster responses to crises by greatly reducing delivery time.

Today, most countries in Europe give almost all their food aid in cash for local and regional purchases by nongovernmental organizations and the World Food Program. In 2005, a record 2.55 million metric tons of food aid were sourced through local or regional purchases in developing countries. In addition to the European Union, Australia and Canada have relaxed their domestic food aid procurement rules and moved toward more cash-based programming. More than half the two countries' food aid is purchased locally.

Despite these shifts, the United States, which accounts for more than half the world's food aid, remains reliant on domestically sourced food. In recent years, proposals to relax domestic procurement rules have been blocked, under pressure from a coalition of agribusinesses, shipping companies, and nongovernmental development and relief organizations. Politics continue to dissipate the pressure for reform.

Public works often have both scalable financing and adaptive self-targeting. India's Maharashtra Employment Guarantee Scheme provides such employment, an important safety net reducing the cost of risk management and protecting family assets in the event of shocks. Employment in this countercyclical program expanded by 64 percent in response to a drought in 1982. Similarly, Argentina's Trabajar program increased participants' current income.⁶³ Workfare programs also offer an opportunity for low-skilled and rural workers to acquire work experience while building rural infrastructure. About half of the Trabajar participants felt that the program improved their chances of

getting a job, two-thirds believed that it gave them a marketable skill, and one-third said that it expanded their contacts in the labor market. Mexico uses commercial insurance to achieve countercyclical funding of its national and subnational public works programs.

Destocking and supplemental feeding, watering, and veterinary care are other counter cyclical programs for pastoral communities. In Kenya the response to a drought includes a transport subsidy that provides a floor for local prices of livestock and prevents a perverse situation in which declining prices increase distress sales of animals. The trigger to support is largely based on the cattle-to-grain price ratio. Even so, evidence from northern Kenya suggests that interventions that preserve vulnerable pastoralists' livestock wealth have higher benefit-cost ratios than more conventional destocking interventions—and related transport subsidies. Veterinary, supplementary feeding, and supplemental water provision had benefits 2.6–5.3 times the costs.⁶⁴

A final word on rural labor markets, mobility, and migration: stunningly little policy attention

As agriculture intensifies and diversifies, and economies develop, well-functioning rural labor markets and migration are crucial in reducing rural poverty and dampening rural-urban income disparities. But stunningly little policy attention has turned to the structure, conduct, and performance of rural labor markets and how they ease successful transitions out of agriculture. Certainly, special attention is needed to provide training to workers to take good jobs, to adjust labor legislation that protects them but does not stifle employment, and to help migrants find good employment elsewhere. Interventions are also needed on the demand side of the labor market and on safety nets for the disadvantaged. Compared with other aspects of the rural economy, much is left to be explored in understanding how to improve rural labor markets.

Focus G. Education and Skills for Rural Development

The rural world is changing rapidly, and young people need to be prepared to rise to the new opportunities. Agriculture is also changing, with new technologies, products, markets, and business environments. And many rural people will need to become engaged in nonfarm activities, or migrate to urban areas. To seize these opportunities, all will need skills that differ from those of their parents—but education and training systems are not ready to face the challenge.

Basic skills and beyond for rural youth

Across the developing world, the challenge of providing appropriate education and relevant skills to rural youth needs to be met—it is necessary to provide a basic education that motivates them, training to give them skills for the labor market, and opportunities for some to pursue higher education.

Improving the quality of basic education

Despite progress over the past decade in increasing access to schooling in the developing world, education levels measured by years of schooling are still dismal in many countries. Low attainment in rural areas is often attributed to farm work; in those areas, children miss school or drop out to help with farm or household work. But studies of child labor show that of the 5- to 14-year-old children not in school, 37 percent do not work and an additional 32 percent do only domestic work.¹ Other reasons for dropping out include the inability to meet costs of attendance, distance to school, a curriculum or language incompatible with local conditions, beliefs that education is not necessary, and poor school quality. Improving basic education in rural areas, whether primary education in Africa or secondary in Latin America, is essential to energize the process of rural development.

The poor quality of rural schools diminishes their attractiveness and the benefits of schooling. The PROBE report of public schools in rural India showed that physical infrastructure was woefully inadequate, with 82 percent of schools needing repair.² Books are often unavailable, and teacher absenteeism tends to be high. A study of primary schools in six developing countries found that 19 percent of teachers were absent on any given day, and 23 percent were absent in rural schools in India, Indonesia, and Peru.³ Teachers present are unprepared and poorly paid, and violence and harassment are common. The PROBE report found that many children did not like school because they were mistreated or discriminated against, and in many countries fear of violence in schools leads children to drop out.⁴

Low quality of schooling means little learning—it is not uncommon to find fifth graders who cannot read and write⁵—and low educational attainment reduces the possibilities for employment.

Skills for employment

Finding and maintaining employment requires broad-based occupational skills or specific job-related skills, acquired in training institutions or on the job. In today's rapidly evolving and globally competitive economy, they increasingly include personal capabilities such as flexibility, resourcefulness, and communication.

Vocational schooling. Vocational schools aim to prepare students for entry into the labor market. In developing countries the vocational education sector tends to be smaller (22 percent of student enrollment) than in Organisation for Economic Co-operation and Development countries and geared to lower educational levels such as lower secondary education.⁶ It is also often uncoordinated, with vocational training centers dispersed under various ministries. Programs that have private participation in managing institutions (Brazil's SENAR) and designing curricula (Namibia's *Community Skills Development Centers*) have been most effective in meeting labor market demands.

SENAR is managed by an agricultural employers' association, and members of agricultural cooperatives make up the board.⁷ One of its most successful features is the integration of occupational training and social promotion in the same organization. The learning process is related to rural work and living conditions and rural women are given preference for social promotion programs, including training in protection against toxic products used in agriculture.

In Namibia seven Community Skills Development Centers impart basic skills to enable youths to generate income through wage employment or self-employment. The centers are training institutions that vary their basic training courses as income-generating opportunities change in the local economy. To align with market needs, experts conduct market assessments, covering the occupational interests of youth, the local development plans, and the needs of employers and businesses in both the formal and informal sectors.⁸

Enterprise training. Enterprises also provide training, available only to those with formal jobs, usually those with higher levels of education. Smaller enterprises train less frequently and often use apprenticeships, which can perpetuate traditional skills that may not be useful in changing markets.

Training programs for firms in niche markets with good growth prospects have raised the productivity and income of enterprises by upgrading technology and managerial skills. In Madagascar training is targeted to small suppliers of intermediate goods for processing and exporting.⁹ Other examples include the Tanzania Integrated Training for Entrepreneurship Promotion and the Ghana Opportunities Industrialization Council.¹⁰

Higher education

The transition to higher education, which is particularly difficult and expensive for rural youth, requires support. The Mexican *Jóvenes con Oportunidades* offers youth in school a savings account in which they accumulate points during grades 9 to 12. The money can

be tapped upon the completion of 12th grade for further study, opening a business, improving housing, or buying health insurance.¹¹ The program thus provides incentives for children to graduate from secondary school and facilitates their continuing on to higher education.

Second chances

Many countries operate programs to get out-of-school youth back into school or into informal training courses—and illiterate youth into literacy programs. Few countries, however, have a system of second chances that meets the diverse needs of young people who have left school at different stages and come from different socioeconomic settings. Successful programs are linked to the school system, informed by the demands of the labor market, and provided on a flexible and part-time basis that can accommodate work and family responsibilities.

Morocco's second-chance schools target the 2.2 million children between 8 and 16 years old who have never entered school or have left before the end of the compulsory cycle. More than three-quarters of them live in rural areas and some 45 percent of them are girls. The Ministry of Education forms partnerships with nongovernmental organizations (NGOs); with the Ministry providing funding, training facilitators, and supplying educational materials; and with NGOs engaging young graduates as facilitators, enrolling pupils, seeking additional funding, and managing local programs.¹²

Business education for the entrepreneurs of the “new agriculture”

Entrepreneurs in the new agriculture need the skills and competencies to operate in open and demanding markets. Though advanced agronomic techniques remain essential, entrepreneurs also need a better understanding of the business side of their operations. They need more and better market information and greater understanding of their costs and revenues, the required investments, and the value chain they operate in.

To help students get a foothold in the new agriculture, some African universities encourage business development. The University of Swaziland and the Botswana College of Agriculture offer practical Entrepreneurial Projects. Business plans are put into practice using a revolving credit fund, with students retaining 75 percent of the profits. In Mali an agricultural research organization, Institut d'Économie Rurale, and a higher education institution, Institut Polytechnique Rurale, have joined to establish the Mali Agribusiness Incubator to help agricultural entrepreneurs integrate modern technologies into local agricultural systems.¹³

Costa Rica's EARTH University¹⁴ prepares graduates to start up agricultural enterprises, emphasizing values development, environmental management, and community service.¹⁵ Uganda's Makerere University is in the process of adapting the EARTH University approach. In Chile, Management Centers run by farmer organizations support decision-making, entrepreneurial, and managerial capabilities among individual family farms and market-oriented producer organizations.¹⁶

Agricultural professionals and researchers

The new agriculture also requires more and better trained researchers, agroentrepreneurs, and farmers.¹⁷ But the education and training structures are not always up to this task.

Sub-Saharan Africa's human resource pool is severely depleted. Among the 27 African countries, half saw a decline in the number of agricultural researchers in the 1990s.¹⁸ Only one in four African researchers currently possesses a doctorate. The huge potential for women professionals to upgrade farming systems remains largely untapped, with women making up just 18 percent of African agricultural scientists.¹⁹ The brain drain of senior staff and unfilled positions are widely reported in research agencies and universities. Too often, staff shortages are compounded by the loss of life from HIV/AIDS. For more than a decade, donors have turned their back on funding higher education and overseas training in agriculture. A new generation of agricultural professionals is needed to replenish this dwindling human resource pool and engage the shifting opportunities associated with the rise in market-driven production.

Efforts to revitalize agricultural education should concentrate on updating curricula, transforming teaching practices, and increasing the number of graduates at all postsecondary levels. Most agricultural education institutions offer curricula focused narrowly on the production of predominant crops and livestock. Curriculum reform should introduce greater institutional flexibility in the face of rapid change and greater responsiveness to employers and stakeholders.

One effort to correct these deficiencies is the professional upgrading developed for extension workers by a dozen Anglophone and Francophone universities with assistance from the Sasakawa African Fund for Extension Education. Focusing on mid-career professionals, the program offers a reformed interdisciplinary curriculum leading to bachelor of science and master of science degrees, emphasizing technology transfer, participatory methods, and respect for local knowledge.²⁰

For agricultural higher education, priority should be given to a major staff development campaign. In the 1960s the Brazilian government dispatched 1,000 academic staff for overseas studies. In the 1970s the Brazilian Agricultural Research Enterprise (EMBRAPA) sent 500 agricultural researchers abroad for doctoral degrees.²¹ These are the professionals who have guided the impressive growth and diversification of Brazilian agricultural exports over the past three decades.

Aggressive human capital development programs have paid long-term dividends for Brazil, India, Malaysia, and other countries. Is it not possible for Africa to follow a similar path? Because of the retirement of senior academic staff and researchers, Africa should launch a vigorous human capital campaign with a goal of providing doctoral training to 1,000 new students in agriculture over the next 15 years²² with at least half of these awards earmarked for women. The Female Scholarship Initiative, initiated by Makerere University in Uganda and funded by the Carnegie Corporation, could be a model for this.

Doctoral training can be carried out in existing African centers of strength in agricultural disciplines, such as the African Centre for Crop Improvement in Pietermaritzburg, South Africa, the Jomo Kenyatta University of Agriculture and Technology in Kenya, and the Ecole Nationale Supérieure d'Agriculture in Senegal. Alternatively, they can be carried out in general African universities where business, economics, biological sciences, and science departments can complement the agricultural training.

Because of the interdependence of knowledge across disciplines, it may be better to train agricultural specialists in general universities, where there is close interaction with specialists of other departments, instead of treating agricultural sciences and agricultural economics as isolated disciplines in separate agriculture universities. This change needs to happen now, starting with investments in the postgraduate programs of local universities.

Where local training is not feasible in some disciplines, students can obtain doctoral training at cost-effective overseas sites or through “sandwich” programs that combine locally relevant training with access to international knowledge resources, instruction in research methods, and exposure to a wider range of modern technologies. Greater south-south mobility of students has also facilitated access to postgraduate programs to students in countries without the necessary university infrastructure.

In Sub-Saharan Africa, the second most important destination for students (after Western Europe) is South Africa—9 of 10 students who study in the region go to South Africa. In East Asia, 40 percent of mobile students also remain in the region.²³ The University of Pretoria, South Africa, and the University of Philippines, Los Baños, are main centers for foreign students in the agricultural sciences.

Because of the long time needed to prepare a new generation of agricultural scientists and professionals, urgent action is needed now to design, fund, and implement programs that combine upgrading local universities, supporting regional centers of excellence, and providing cost-effective higher-degree training outside the region.

Focus H. The Two-Way Links between Agriculture and Health

Agriculture can pose major threats to health through increased incidence of malaria linked to irrigation, pesticide poisoning, and diseases transmissible from farm animals to humans in intensive livestock systems. And some of the developing world's major health problems such as AIDS can have disastrous effects on agriculture, through the loss of labor, knowledge, and assets. So coordinating agriculture and health interventions can yield great welfare benefits for the poor in developing countries.

Agriculture affects health, and health affects agriculture. Agriculture supports health by providing food and nutrition for the world's people and by generating income that can be spent on health care. Yet agricultural production and food consumption can also increase the risks of water-related diseases (malaria) and foodborne diseases—as well as health hazards linked with specific agricultural systems and practices, such as infectious animal diseases (avian flu, brucellosis), pesticide poisoning, and aflatoxicosis.¹

Illness and death from AIDS, malaria, tuberculosis, and other diseases reduce agricultural productivity through the loss of labor, knowledge of productive adults, and assets to cope with illness. Because the majority of the world's poor work in agriculture and the poor suffer disproportionately from illness and disease, taking an integrated view of agriculture and health is necessary to address poverty and promote agriculture for development.

The lack of coordination of policy making between agriculture and health² undermines efforts to overcome ill health among poor rural communities and gives short shrift to agriculture's role in alleviating many of the world's most serious health problems. Considered here are malaria, pesticide poisoning, AIDS, and diseases transmitted from animals to humans. The important link through food security and nutrition is discussed elsewhere (Focus on: What Are the Links between Agricultural Production and Food Security?).

Malaria

Every year an estimated 300 to 500 million people get sick from malaria, and more than 1 million die from it, many of them children.³ Characteristics of agricultural production systems, such as crop rotation, the presence of livestock, and the proximity of villages to fields and water sources, affect malarial risk. In particular, irrigation can create conditions that favor parasitic vectors and facilitate disease transmission.⁴ In Ethiopia researchers found malaria prevalence to be higher in those villages close to government-promoted micro dams.⁵ But in Tanzania malaria was less prevalent in irrigated areas, where rice-growing improved incomes so that farm households could afford insecticide-treated nets.⁶

The impact of malaria on agricultural productivity has a long history. In the first half of the 20th century it was the leading public health problem in Italy, much as in many developing countries today. Absences resulting from illness and death were common

during the agricultural season, leaving millions of hectares of Italy's most fertile land fallow.⁷ In the developing world malaria continues to have serious negative impacts on productivity. One study of farmers engaged in intensive vegetable production in Côte d'Ivoire showed that malaria sufferers produced about half the yields and half the incomes that healthy farmers did.^{8,9}

Malaria can be controlled by modifying or manipulating agricultural water systems. In the early 1900s better maintenance and improvements of irrigation and drainage systems reduced malaria cases by more than half in the Arab Republic of Egypt, India, and Indonesia.¹⁰ A case study in India in 1940–41 showed that intermittent irrigation of rice fields reduced malaria contraction from 48 percent to 4 percent. Today, there are many options to mitigate the negative effects of irrigation while maintaining agricultural productivity. They include providing location-specific knowledge of drainage techniques, intermittently wetting and drying rice fields, alternating rice with a dry-land crop, and using livestock as “bait” for mosquitoes.¹¹

Pesticide poisoning

Pesticides can increase agricultural productivity, but when handled improperly, they are toxic to humans and other species. Unintentional poisoning from exposure kills an estimated 355,000 people each year, two-thirds of them in developing countries.¹² Costs of medical treatment, lost labor, and lower long-term productivity can be high.

Many farmers in developing countries overuse pesticides and do not take proper safety precautions because they do not understand the risks and fear smaller harvests. Making matters worse, developing countries seldom have strong regulatory systems for dangerous chemicals: Pesticides banned or restricted in industrial countries are used widely in developing countries.¹³

Farmer perceptions of appropriate pesticide use vary with the setting and culture. It is common in Latin America for farmers to believe that exposure to pesticides increases their tolerance and makes them stronger and more able to work, often leading to very high exposure. In a potato-farming community in Carchi, Ecuador, researchers documented 171 pesticide poisonings per 100,000 people per year in the late 1990s—among the highest in the world. Pesticide poisoning there was the second largest cause of death for men (19 percent) and fourth for women (13 percent). The high health care costs and lost work-time outweighed the benefits of pesticide use. Farmers who focused on naturally preventing or suppressing pests and used pesticides only when necessary substantially reduced exposure while maintaining yields and increasing profitability.¹⁴

In the Philippines in 1989–91 farmers commonly applied two insecticide doses¹⁵ per growing season, elevating their health costs by an average of 70 percent above those who did not use pesticides. The yield benefits from pesticide use were more than offset by the cost of illness.¹⁶

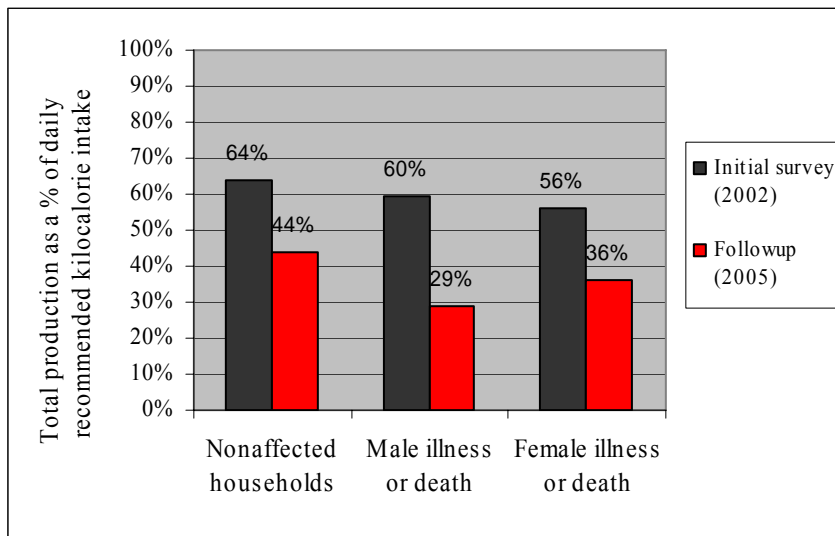
To limit the health and economic costs of pesticide use, policy makers can provide context-specific training and information campaigns and reduce accessibility to the more dangerous agrochemicals through taxation or licensing. Natural control and integrated pest management also show promise. In Nicaragua farmers trained in appropriate pesticide use suffered lower exposure after two years and had higher net returns than did those not trained.¹⁷

HIV and AIDS

In 2006 an estimated 39.5 million people in the world were living with HIV, and an estimated 2.9 million people died from AIDS.¹⁸ The majority of people affected by HIV and AIDS depend on agriculture, and their livelihoods are undermined by the disease in many countries. In many Sub-Saharan countries AIDS demands a rethinking of development policies, and parts of South Asia may face similar situations if the epidemic continues unabated.¹⁹

Illness and death from HIV and AIDS reduce agricultural earnings and productivity. A 1997 study of worker productivity in a Kenya tea estate found the average daily output of HIV-positive workers to be 23 percent less than that of healthy workers in the same fields.²⁰ A study of rural households in Mozambique showed that a household that suffered an adult male illness or death likely to be HIV-related experienced a significant reduction in food production, a major problem for households relying on subsistence production and already far below their recommended food intake (figure 1).

Figure 1. Staple food production declines after an AIDS-related death in Mozambique.



Source: Data from Donovan and Massingue (2007) comparing the kilocalorie production of households affected by an adult illness or death, likely to be AIDS-related, with unaffected households in rural Mozambique.

Note: Because these are subsistence farmers, production can be used as a measure of consumption. Percent daily recommended kilocalorie intake equals the median home production (kcal/day/adult equivalent) divided by the recommended consumption (3,000 kcal/day/adult equivalent).

HIV/AIDS also reduces the capacity of the agricultural civil service. Between 1996 and 2000 in Kenya, 58 percent of all deaths of staff in the Ministry of Agriculture were AIDS-related.²¹ And Mozambique's Ministry of Agriculture projects that it may lose 20–24 percent of its staff to HIV/AIDS from 2004 to 2010.

Lower agricultural earnings and productivity can also increase the risk of contracting HIV. Facing insecure livelihoods, some household members migrate to find work or engage in transactional sex. Many studies show a significant correlation between HIV prevalence and migration, suggesting that mobility increases the probability of risky behavior.²²

There is tremendous scope for agricultural policy to become more HIV-responsive and further both health and agricultural goals. Promoting labor-saving technologies and crops is one way to address lost labor resulting from AIDS-related mortality in agriculture. But for poorer smallholder households, the main constraints on livelihoods may be land and cash rather than labor. So cash transfers to help them hire labor, more secure land tenure for women, and expanded agriculture extension programs to include women could have a greater impact on welfare.²³

Targeted programs can capitalize on the links between AIDS and agricultural livelihoods. To overcome the lack of land and labor often facing AIDS-affected households, the Livelihoods Recovery through Agriculture Programme, implemented in Lesotho in 2002 by CARE and the Ministry of Agriculture, promotes producing crops with high nutritional content on small plots of land close to the home. Of the participants, 53 percent reported that they had stabilized or increased their food production.²⁴ Another program in Mozambique provides orphans and vulnerable children in high HIV-prevalence areas with crucial farming and life skills as well as nutritious daily meals. Similar programs are being tested in Kenya, Namibia, Swaziland, and Zimbabwe.²⁵

The rise of zoonotic disease threats

The livestock revolution in developing countries has been associated with the growth of unprecedented concentrations of animals in the urban and periurban areas of developing countries, with major implications for human and animal health. Of 1,415 species of infectious organisms known to be pathogenic to humans, 61 percent are zoonotic, or transmissible from animals to humans. And of the 175 pathogenic species of infectious organisms considered to be “emerging” (or reemerging) in humans, 75 percent are zoonotic.²⁶ The poor are especially exposed because of the proximity of their living spaces to farm animals.

Zoonotic diseases of significance in developing countries fall into three categories based on the form of transmission: foodborne (cysticercosis, brucellosis, tuberculosis), infectious (avian influenza, tuberculosis), and vector-borne (rabies or trypanosomosis).

Animal disease has long been a major economic issue. The losses from animal deaths from the H5N1 strain of highly pathogenic avian influenza and the costs of controlling it

run into the tens of billions of dollars. Since late 2003 the H5N1 strain of avian influenza has been responsible for 4,544 documented outbreaks in poultry in 36 countries, associated with 269 human cases and 163 fatalities (as of January 2007). The virus is not easily transmitted to and within humans. But the great concern is that it could mutate within either animal or human hosts to become easily transmissible from humans to humans, raising the possibility of a disastrous pandemic.

The primary method of controlling animal diseases is to quickly cull diseased animals and others they may have come in contact with, reducing the viral load. Vaccinations are expensive and difficult to implement under developing country conditions.²⁷ So controlling zoonotic disease in the animal vector is critical.²⁸ The key is to respond quickly and comprehensively once the disease appears in animals.²⁹