Rural households and their pathways out of poverty

chapter 3

Agriculture is a major source of livelihoods for people in developing countries, but rural areas are a large harbor of poverty. To understand how agricultural growth can reduce rural poverty, this chapter identifies three pathways out of rural poverty. It characterizes the livelihood strategies of rural households and identifies challenges to defeating rural poverty through these pathways.[1]

Many rural households move out of poverty through agricultural entrepreneurship; others through the rural labor market and the rural nonfarm economy; and others by migrating to towns, cities, or other countries. The three pathways are complementary: nonfarm incomes can enhance the potential of farming as a pathway out of poverty, and agriculture can facilitate the labor and migration pathways.

Inspecting what individuals and households do in rural areas helps dismiss two frequent misconceptions about rural populations. The first is the belief that rural households are either all farmers or all diversified. To the contrary, there is a considerable heterogeneity in what they do and in the relative importance of what they do for their incomes. A large majority of rural households are engaged in some agricultural activity, but many derive a large part of their income from off-farm activities and from migration. Individuals participate in a wide range of occupations, but occupational diversity does not necessarily translate into significant income diversity in households.

The second misconception is the belief that the type of activities households pursue determines their success in moving out of poverty. This is not so because of the considerable heterogeneity within activities. Livelihood strategies in agriculture are characterized by dualism between market-oriented smallholder entrepreneurs and smallholders largely engaged in subsistence farming. There is a parallel dualism in the labor market between high-skill and low-skill jobs, and between migration with high and low returns. Nor is diversification always a sign of success. Chapter 9 analyzes the factors underlying the heterogeneity in labor market and migration outcomes, with a focus on policy measures to improve these outcomes for the rural poor.

Rural households design livelihood strategies to suit their asset endowments and account for the constraints imposed by market failures, state failures, social norms, and exposures to uninsured risks. They may not use those terms, but they certainly understand the constraints. Their strategies can reflect joint decision making by men and women in the household, or can be bargained outcomes when members each pursue their own advantage. But their strategies compensate for only part of the constraints they operate under, leaving important roles for improvements in their access to assets and in the contexts for using these assets.[2] The key, then, is to enhance collective action and mobilize public policy to maximize the likelihood of success for rural households to travel a pathway out of poverty.

Policy makers thus face daunting challenges. The asset endowments of rural households have been low for generations, and they continue to decline in places. Market and government failures affecting the returns on those assets are pervasive. Adverse shocks often deplete already-limited assets, and the inability to cope with shocks induces households to adopt low-risk, low-return activities. Recent changes in the global food market, in science and technology, and in a range of institutions that affect competitiveness are also creat-

ing new challenges to the competitiveness of smallholders. Understanding these challenges is essential in designing public policies that can help rural men and women pull themselves out of poverty. The challenges differ across countries and subnational regions, and thus demand context-specific agendas to reduce rural poverty.

Three complementary pathways out of rural poverty: farming, labor, and migration

Rural poverty rates have declined in many countries (see focus A). But how exactly has this happened? Is it that poor households leave rural areas, or that older, poor generations are replaced by younger, less-poor generations? Have specific households been able to escape poverty by gradually improving the earnings from whatever they do, or has this happened by drastically changing activities? Success stories help illustrate how rural households have exited poverty through the three pathways of farming, labor, and migration.

In Tanzania, those most successful in moving out of poverty were farmers who diversified their farming activities by growing food crops for their own consumption and nontraditional cash crops (vegetables, fruit, vanilla) as well as raising livestock. People who remained in poverty were those who stuck to the more traditional farming systems. In Uganda, escaping from poverty was linked to improving the productivity of land and diversifying into commercial crops. Qualitative evidence for Niger shows that shifts to more sustainable cultivation practices by small-scale farmers led to better soil conservation, increased income from agroforestry, and lower vulnerability.[3]

Some policy reforms have greatly enhanced the capability of smallholder entrepreneurs to lift themselves from poverty. This was clearly a key to China's early agricultural success story (see focus A). In Malawi, reforms reducing differential protection of large estates dramatically shifted the structure of agricultural production. Smallholders rapidly diversified into cash crops and now produce 70 percent of burley tobacco, a major export crop. The expansion helped many households move up the socioeconomic ladder. Others benefited from greater trade in food crops.[4]

In Vietnam, liberalizing agricultural markets induced many subsistence farmers to become more market oriented (table 3.1). Two-thirds of smallholders previously engaged primarily in subsistence farming entered the market. Their poverty rates fell drastically, and their incomes almost doubled, while the production of high-value and industrial crops rose. Agricultural sales increased more for households with larger land endowments and those closer to markets or with nonfarm industries in their communities. Households engaged in subsistence farming that did not enter the market were more likely to diversify their income sources outside of agriculture, with poverty rates in those groups falling as well.

In India, income from the nonagricultural sector—the labor pathway out of poverty—was an important driver of growth in rural areas between 1970 and 2000. Nonagricultural employment also had important indirect effects by increasing agricultural wages. In Indonesia, agricultural households that shifted into the nonfarm economy between 1993 and 2000 were likely to have exited poverty. In Tanzania, too, business and trade provided an important pathway out of poverty, but only for those with networks in well-connected communities. In addition, remittances from both domestic and international migration have reduced rural poverty, as happened in rural China and Nepal.[5] Migration can offer a pathway out of poverty for those who leave and for those who stay behind (chapter 9).

Several pathways often operate at the same time. In Bangladesh and Tanzania, the farm, nonfarm labor, and migration pathways were all successful. In Indonesia, some people moved out of poverty through the farming pathway, others through the nonfarm pathways. And in 35 villages in Andhra Pradesh, diversification of income sources is correlated with moving out of poverty.[6]

These careful studies using longitudinal data have shed light on the strong potential relationships between poverty reduction and each of the pathways. However, establishing causality is difficult, and there is no

Table 3.1 Changing market participation among farming households in Vietnam

	Subsistence oriented 6[a]		Market entrant 13[a]		Market oriented 28[a]	
Household characteristics	**1992/3**	**1997/8**	**1992/3**	**1997/8**	**1992/3**	**1997/8**
Assets						
Land owned (ha)	0.37	0.43	0.50	0.57	0.60	0.72
Land used (ha)	0.55	0.43	0.59	0.58	0.71	0.75
Education of household head (years)	4.6	—	6.3	—	6.3	—
Context						
Market in community (%)	31	—	40	—	47	—
Commercial enterprise in community (%)	34	—	43	—	42	—
Outcomes						
Real income per capita (1998 dong 1,000)	893	1,702	1,138	2,042	1,359	2,978
Share of agricultural income in total income (%)	80	62	83	66	83	73
Share of households below the poverty line (%)	86	62	73	48	64	37
Shares of gross agricultural income by crop type						
Staple crops (%)	78	73	70	61	63	54
High-value and industrial crops (%)	14	13	21	31	29	39

Source: WDR 2008 team using VLSS 1992/93 and 1997/98.
Note: Subsistence-oriented farming households are defined here as selling less than 10 percent of their agricultural production in both years; market-entrant households as selling less than 10 percent in 1992/3 and more than 25 percent in 1997/8; and market-oriented households as selling more than 25 percent in both years. Rural farming households are households with more than 50 percent of income from agriculture.
a. Percent of rural farming households.
— = not available.

systematic evidence on the relative importance and success of these strategies, a result of conceptual challenges in understanding the dynamics of poverty (box 3.1).

Pathways often enhance each other

The complementing effects of farm and nonfarm activities can be strong. In Bangladesh and Ecuador, farm households with better market access or in areas with higher agricultural potential earn more from agriculture, but they also diversify more into nonfarm activities. In Asia, high rural savings rates from rising incomes during the green revolution made capital available for investment in nonfarm activities.[7] Diversification into nonfarm activities can relax credit and liquidity constraints on own-farm agricultural production and enhance the competitiveness of the family farm on the agricultural pathway.

The farming, labor, and migration pathways have often enhanced each other. In the Philippines, the green revolution allowed children of land reform beneficiaries and large farmers—especially daughters—to attain high levels of education. These highly educated offspring are now sending large transfers back to farm households. In Pakistan, remittances from temporary migrants have a large impact on agricultural land purchases, and returning migrants are more likely to set up a nonfarm business.[8]

While transfers from migrants back to the farm household can relax capital and risk constraints, the relationship between migration and agricultural productivity is complex. The (temporary) absence of household members reduces the agricultural labor supply. Agricultural productivity can therefore fall in the short run but rise in the long run as households with migrants shift to less labor intensive, but possibly equally profitable, crops or livestock.[9] Male out-migration can transfer responsibility for farm management to women. And where women have less access to credit, extension, and markets, as is frequently the case, farm productivity might fall as a result. The transfer of responsibility may also be only partial, limiting women's possibilities to take advantage of emerging opportunities to improve competitiveness.

The variation in rural households' income strategies

Contrary to the prototypical image of smallholders as pure farmers, landed rural households rely on many activities and income sources. Besides farming, they par-

ticipate in agricultural labor markets, in self-employment or wage employment in the rural nonfarm economy, and they might receive transfers from household members who have migrated.

Diversification has several dimensions that should not be confounded. The rural economy is diversified, even if many nonagricultural activities are indirectly linked to agriculture. Within this diversified rural economy, a large part of household income diversification comes from combining incomes from the different household members, each often specializing in one occupation. In Malawi, 32 percent of farm households have two sources of income, and 42 percent have three or more, but among household heads only 27 percent engages in more than one activity. In China, 65 percent of rural households operate in both the farm and nonfarm sectors, while only a third of individuals do so.[10] These patterns imply that household income diversification can fluctuate considerably with households life cycles, and the number of working-age individuals in the household. Further, the returns on many of these activities are low, and the diversity of occupations does not always translate into income diversification: one activity is often the dominant source of income.

To design policies that help households along successful pathways, it is crucial to understand which income strategies they currently pursue and why they chose to pursue them. This allows evaluating whether policies should aim at enhancing their current strategies or at helping them to pursue more remunerative ones. Furthermore, understanding why some households remain poor despite choosing strategies that are optimal, given their assets and constraints, helps to identify policy options.

A typology of rural households

Rural households engage in farming, labor, and migration, but one of these activities usually dominates as a source of income. Five livelihood strategies can be distinguished. Some farm households derive most of their income from actively engaging in agricultural markets *(market-oriented smallholders)*.[11] Others primarily depend on farming for their livelihoods, but use the majority of their produce for home consumption *(subsistence-oriented farmers)*.[12] Still others derive the larger part of their incomes from wage work in agriculture or the rural nonfarm economy, or from nonagricultural self-employment *(labor-oriented households)*. Some households might choose to leave the rural sector entirely, or depend on transfers from members who have migrated *(migration-oriented households)*. Finally, *diversified households* combine income from farming, off-farm labor, and migration.

Income sources can be used to classify rural households according to the five livelihood strategies (table 3.2 and box 3.2). The relative importance of each differs across the three country types: agriculture-based, transforming, and urbanized. It also differs across regions within countries. Farming-led strategies are particularly important in the agriculture-based countries, where farming is the main livelihood for a large share of rural households, as many as 71 percent in Nigeria and 54 percent in Ghana and Madagascar. Many of those households are subsistence oriented.

In the transforming and urbanized countries, the labor- and migration-oriented

BOX 3.1 *Establishing the relative importance of the different pathways*

Moving out of poverty is a process that can take a very long time. Many shocks can occur during that time, and a household's income fluctuations may be similar in magnitude to long-term income changes. So, in the short-term, it is seldom clear whether observed income changes reflect transitory movements in and out of poverty, or long-term trends. Only by interviewing the same households many times over long periods might it be possible to gauge the relative importance of different pathways in a particular context.

Consider trying to capture the full effects of the migration pathway on those who migrated. When people migrate, they typically disappear from surveys, unless one manages to track them down in their new locations, which can be difficult. Moreover, a lot of migration is by young people, before they form independent households. It is thus not possible to know whether they would have been poor had they not migrated (see focus A). This is particularly important because many migrants are more educated than those who stay behind, and they would probably not have been among the poorest.

Nor is it easy to disentangle why households chose a particular strategy from what made the pathway successful. More entrepreneurial households might choose "better" strategies, but they might also be more successful in moving out of poverty independently of the strategies they choose. Some migration studies have addressed this selection issue and established the effects of migration on the poverty of household members left behind. But doing this for the other pathways remains unresolved.

Table 3.2 Typology of rural households by livelihood strategies in three country types

			Farm oriented						
			Market oriented	Subsistence oriented	Total	Labor oriented	Migration oriented	Diversified	Total
	Country	Year	(Percentage of rural households in each group)						
Agriculture-based countries	Nigeria	2004	11	60	71	14	1	14	100
	Madagascar	2001	—	—	54	18	2	26	100
	Ghana	1998	13	41	54	24	3	19	100
	Malawi	2004	20	14	34	24	3	39	100
	Nepal	1996	17	8	25	29	4	42	100
	Nicaragua	2001	18	4	21	45	0	33	100
Transforming countries	Vietnam	1998	38	4	41	18	1	39	100
	Pakistan	2001	29	2	31	34	8	28	100
	Albania	2005	9	10	19	15	10	56	100
	Indonesia	2000	—	—	16	37	12	36	100
	Guatemala	2000	4	7	11	47	3	39	100
	Bangladesh	2000	4	2	6	40	6	48	100
	Panama	2003	1	5	6	50	6	37	100
Urbanized countries	Ecuador	1998	14	11	25	53	2	19	100
	Bulgaria	2001	4	1	5	12	37	46	100

Source: Davis and others 2007.
Note: Farm-oriented household: more than 75 percent of total income from farm production.
Farm, market-oriented household: more than 50 percent of agricultural production sold on market.
Farm, subsistence-oriented household: less than or equal to 50 percent of agricultural production sold on market.
Labor-oriented household: more than 75 percent of total income from wage or nonfarm self-employment.
Migration/transfers-oriented household: more than 75 percent of total income from transfers/other nonlabor sources.
Diversified household: Neither farming, labor, nor migration income source contributes more than 75 percent of total income.
— = not available.

strategies are more common, with shares of labor-oriented households varying from 18 percent in Vietnam to 53 percent in Ecuador.[13] Among these households, wages from nonagricultural labor often contribute a large share of average labor income (as in Indonesia, Pakistan, and Panama), while nonagricultural self-employment earnings are more important in labor-oriented households in Ghana and Vietnam. In Bulgaria, Ecuador, and Nepal, agricultural wages are important for the income of labor-oriented households. Despite the importance of the labor pathway in transforming countries, market-oriented farming households remain the largest rural group in Vietnam.

Even if most households are specialized—that is, they derive the vast majority of their income from only one of the three income sources (farming, labor, or migration)—a substantial remaining share of households in all countries has diversified income strategies. In the 15 countries of table 3.2, 14 to 56 percent of households do not derive more than 75 percent of their income from one of these three sources, but instead have a more mixed income portfolio.[14] These diversified households derive between 20 percent (in Bangladesh) and 46 percent (in Ghana, Malawi, and Vietnam) of their income from farming.

BOX 3.2 *Constructing comparable measures of income across countries*

The analysis of sources of rural income presented here is based on income aggregates from the Rural Income Generating Activity database. For each country the income components include wages (separately for agriculture and nonagriculture), self-employment, crops, livestock, transfers, and a final category of all remaining nonlabor income sources (excluding imputed rent), as reported in each country questionnaire. All aggregates are estimated in local currency at the household level and annualized and weighted. Some of the country results may differ from results previously published in poverty assessments and other country reports because of efforts to ensure comparability across countries in the results presented here.

Analyses that draw on income aggregates from different sources using different methodologies would make it impossible to compare results between different countries.

While the standardized calculations across countries enhance comparability, the analysis of sources of rural income is constrained by the pervasive weakness of the raw income data in many of the surveys analyzed. Many household surveys likely underestimate income because of underreporting, misreporting of the value of own consumption, income seasonality, and the difficulty of obtaining reliable income data from households that do not usually quantify their income sources.

See Davis and others (2007) and www.fao.org/es/esa/riga/ for further information on methodology.

Heterogeneity of the household strategies

A household's income structure does not tell whether it is engaged in a successful income strategy. Each of the strategies can become pathways out of poverty, but many households do not manage to improve their situation over time, reflecting the marked heterogeneity in each of the activities and the fact that income varies widely for each of the strategies (figure 3.1).[15]

Rural occupations and income sources

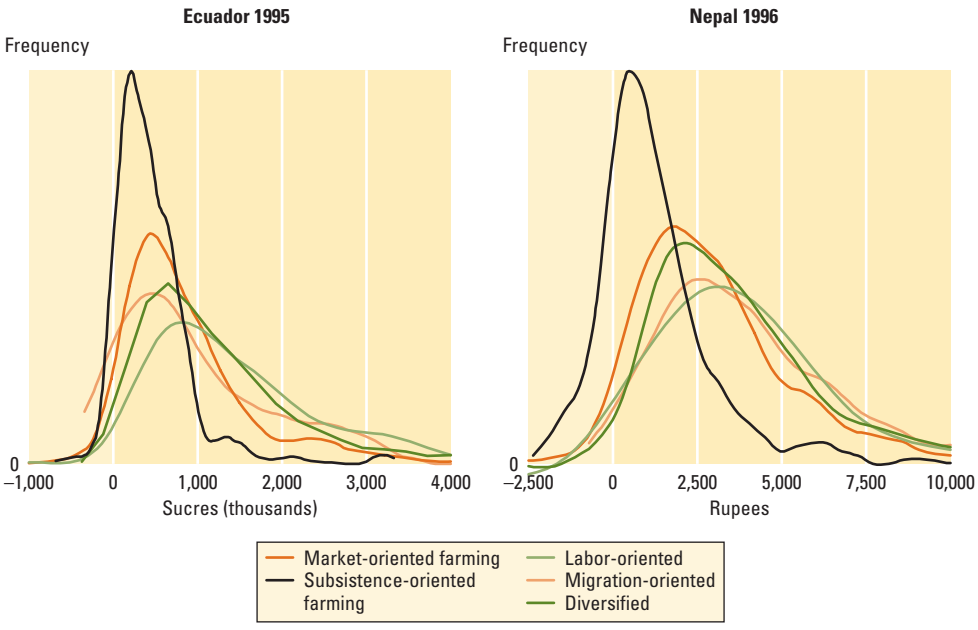
The heterogeneity in each of the household strategies reflects differences in the returns on the various activities of rural households and individuals. The economic activities and the sources of income themselves also differ substantially across regions, between poor and rich households, between households with different asset endowments, and between men and women.

Agriculture: a major occupation for rural households, especially for the poor

The Food and Agriculture Organization of the United Nations (FAO) estimates that agriculture provides employment to 1.3 billion people worldwide, 97 percent of them in developing countries.[16] It is also a major source of income for rural households. Between 60 and 99 percent of rural households derive income from agriculture in 14 countries with comparable data (figure 3.2). In the agriculture-based countries in figure 3.2, farm crop and livestock income and agricultural wages generated between 42 and 75 percent of rural income. Onfarm income comes both from production for self-consumption and from sales of agricultural products to the market. In the transforming and urbanized countries, the share of rural income from onfarm activities and agricultural wages is between 27 and 48 percent. So, participating in agricultural activities does not always translate into high agricultural income shares.

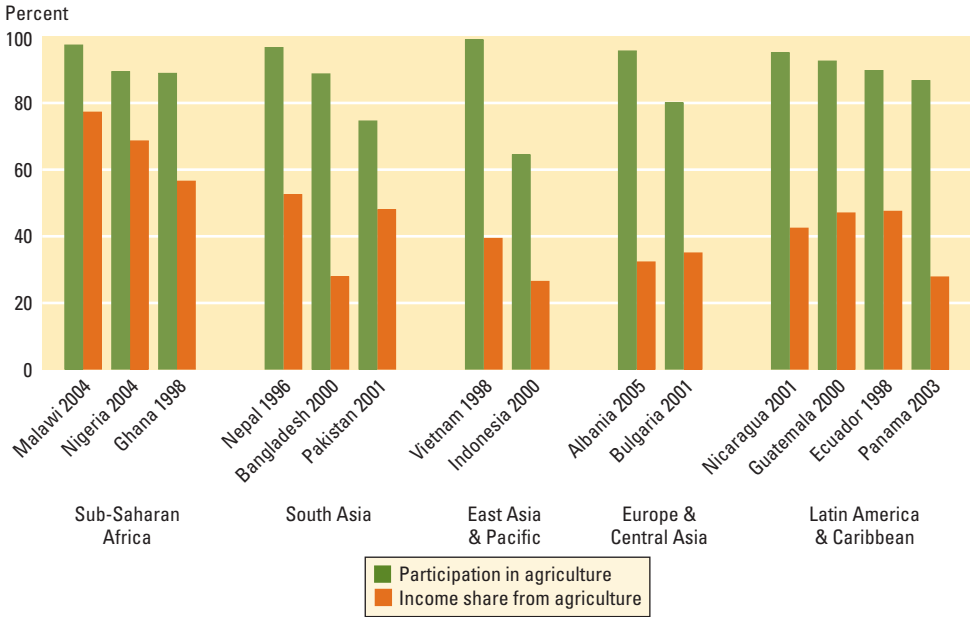
For the poorest households, onfarm income and agricultural wages typically account for a larger share of household income, ranging from 77 percent in Ghana to 59 percent in Guatemala, than for richer households (figure 3.3). In Asia, Latin America, and some countries in Africa (Malawi and Nigeria), agricultural wages are more important for low-income than for high-income households. Onfarm

Figure 3.1 Real per capita income varies widely for each livelihood strategy



Source: Davis and others 2007.

Figure 3.2 In most countries, the vast majority of rural households participate in agriculture



Source: Davis and others 2007.

income often declines as overall expenditures increase (in Ghana, Guatemala, and Vietnam, for example), but it is most important for households in the middle of the distribution of income in Nepal.

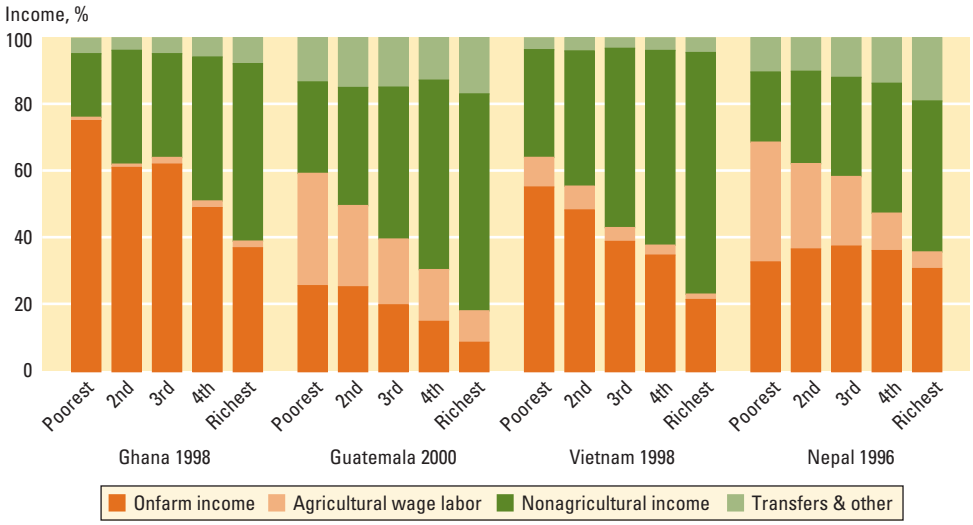
In most countries, there is a marked dualism in the smallholder sector, between market-oriented farmers and smallholders engaged in subsistence farming. Only a very small share of all marketed agricultural products is produced by the subsistence-oriented households. In Malawi, subsistence farmers sell about 9 percent of the marketed agricultural products, but in Nepal and Vietnam, less than 2 percent.[17] The dualism in household farming strategies usually reflects differences in asset endowments. Farmers with larger land endowments are more likely to be market-oriented. Market-oriented farmers own almost twice as much land as subsistence farmers in Nicaragua and Panama, and four times more land in Pakistan. The human capital endowments of rural households are also correlated with their market orientation. Educated household heads are often more likely to sell a large share of their products to the markets, while female-headed households more often produce for self-consumption.

Yet asset endowments are not always good predictors of market orientation. Differences in land endowment between market- and subsistence-oriented farmers are much less pronounced in Bangladesh, Guatemala, and Malawi. In Ghana and Nigeria, female-headed households are more likely to be market oriented than subsistence oriented. This shows that market orientation can also be conditioned by many other factors, such as land quality, access to markets, or agricultural potential affecting crop and livestock choice and productivity.

Within the household, market orientation can differ with the gender of the cultivator, and women are often more likely to be engaged in subsistence farming and less likely to cultivate cash crops. Large-scale production of nontraditional and high-value agricultural exports has, however, increased women's wage work in fields, processing, and packing. This does not hold everywhere. In China, for example, the evidence suggests there is no feminization of agriculture.[18]

More generally, women's participation in agricultural self-employment differs across regions. In Africa, Europe and Central Asia, and some East Asian countries, men and women work equally in agricultural

Figure 3.3 Sources of income vary between poor and rich



Source: Davis and others 2007.
Note: For each country, columns represent the bottom fifth to the top fifth of the expenditure distribution.

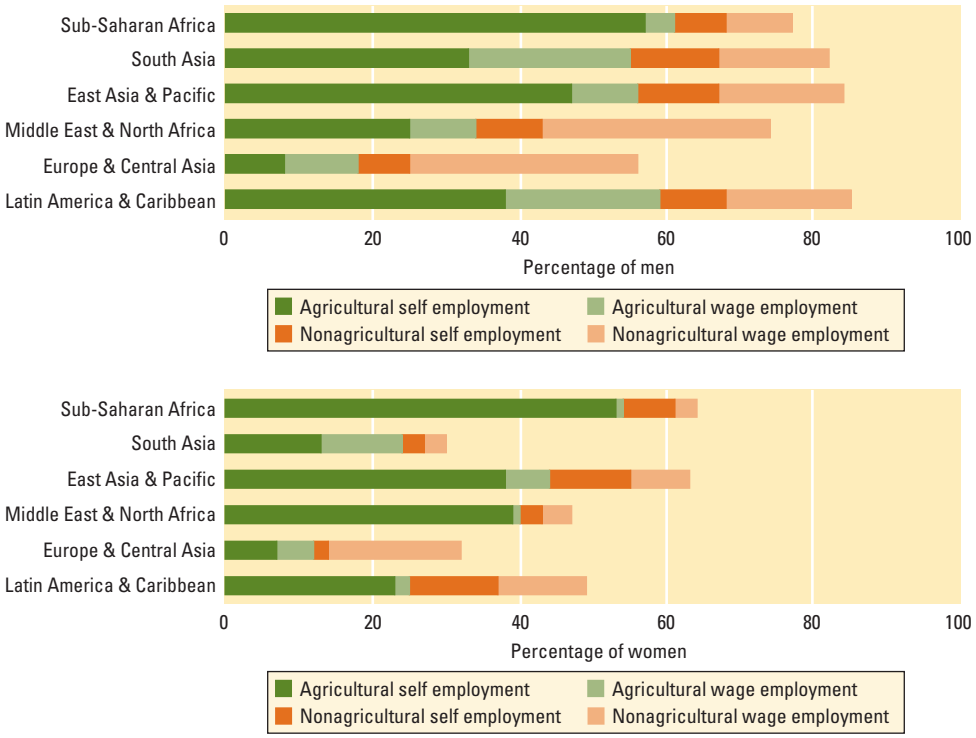
self-employment[19] (figure 3.4). In Mozambique, Rwanda, Uganda, and Egypt, women are even more likely to participate in agricultural self-employment. By contrast, in Latin America and South Asia, women reportedly work less in agricultural self-employment. But in these regions, as well as in Africa, women have broadened and deepened their involvement in agricultural production in recent decades.[20] Yet many development policies continue to wrongly assume that farmers are men. The important role of women in agriculture in many parts of the world calls for urgent attention to gender-specific constraints in production and marketing.

Income diversification and specialization in wage employment and nonagricultural self-employment

Market-oriented smallholders can be highly successful in food markets and in the new agriculture. But for many smallholders, agriculture is a way of life that offers security and complements earnings in the labor market and from migration. Other rural households specialize in wage employment or nonagricultural self-employment. Households in prosperous agricultural regions may diversify into nonagricultural activities to take advantage of attractive opportunities. Those in less-favored environments may shift into low-value nonagricultural activities to cope with the risks. Households with good asset endowments may seize remunerative opportunities in the nonfarm sector. Those lacking land or livestock may be driven into low-value nonfarm employment. Labor market income can also be important where population pressures on limited land resources are high or where seasonal income from farming is insufficient for survival in the off-season, possibly because of chronic rainfall deficits, prices, or diseases.[21]

Off-farm income can be important for both poor and rich households. Yet, the rich often dominate lucrative business niches. The poor, lacking access to capital, education, and infrastructure, are not the main beneficiaries of the more lucrative sources of nonfarm income. This is, in part, because of the differential access to high-skill and low-skill jobs (chapter 9). Illiterate adults are more likely to be working in agricultural wage and self-employment. Literate adults are more likely to have nonagricultural wage jobs. And older cohorts are less likely to be working in nonagricultural wage employment than younger cohorts.[22]

Figure 3.4 Women's reported participation in agricultural self-employment relative to men's varies by region



Source: Regional averages based on available household surveys for 66 countries (ages 15 to 64).
Note: The omitted group includes individuals out of the labor force and individuals whose economic activity is not defined. Activity refers to the individual's reported principal activity. For a more detailed explanation, please see endnote 19 on page 272. See also WDR 2008 team 2007.

Exiting, coping, and acquiring capital through migration

Where access to nonagricultural employment is limited or where the climate (or technology) prevents continual cultivation, seasonal migration can supplement income, smooth consumption, and protect household asset bases during the lean season. Laborers migrate seasonally to other regions in their own country, often attracted to large export crop estates that provide income in the off-season or during emergencies. They also migrate across borders, and a large part of south-south migration is seasonal.[23]

Where migration is more or less permanent, income from migration depends on the success of the migrant and the reason for migration. So migration is not a guaranteed pathway out of poverty (chapter 9). Nor is it available to all. High migration costs often prevent the poorest-of-the-poor from migrating, or limit their migration to nearby areas, where the returns might be low.

Migration responds to income gaps between the origin and the destination. It can occur because people are pushed out of rural areas by negative shocks or a deteriorating resource base—or are pulled out by attractive employment opportunities elsewhere. In Chile, the local unemployment rate is positively correlated with out-migration, but the expansion of agricultural employment and jobs in agroprocessing slowed migration. Cohort analyses with population censuses between 1990 and 2000 for Ecuador, Mexico, Panama, and Sri Lanka suggest that people move out of localities that are more remote, with less infrastructure, and with poorer living conditions. Yet areas with high agricultural potential can also have high out-migration, as in Guatemala. Rural migrants often go abroad or to urban areas that offer better income opportunities. However, many choose to migrate to urban areas that are relatively close by or move to other rural areas (box 3.3).[24]

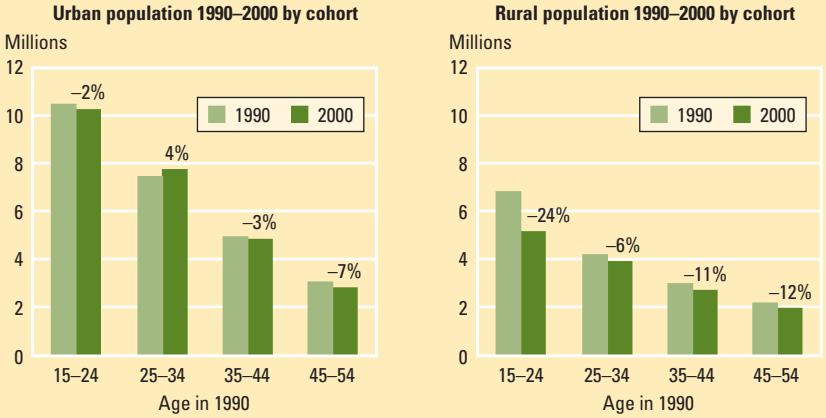
BOX 3.3 *The challenge of drastic demographic changes from selective migration*

Migration can be an important source of remittance income (money sent home by household members who have left to find work), but it often drastically changes the composition of the rural population. This can pose its own challenges for rural development, because migration is selective. Those who leave are generally younger, better educated, and more skilled.[25] Migration thus can diminish entrepreneurship and education level among the remaining population.[26] In addition to changing the skill and age composition of those staying behind, migration can change the ethnic composition of rural populations. Migration rates of indigenous populations are often lower, because they are attached to land as ancestral territories and because they may be discriminated against in labor markets. There are also clear gender differences in migration, but they differ across countries, even within the same region. International migration out of rural areas is male-dominated in Ecuador and Mexico, but female-dominated in the Dominican Republic, Panama, and the Philippines.[27]

Analyses of the population censuses of Brazil and Mexico illustrate some of the regularities. In Brazil between 1995 and 2000, rural men and women ages 20–25 were most likely to migrate, and young women migrated more than men (the first figure below). Illiterate individuals were least likely to migrate, and highly educated individuals were twice as likely to migrate. People at all education levels moved to both urban and rural areas, but the highly educated were much more likely to move to out-of-state urban centers (see figure below).

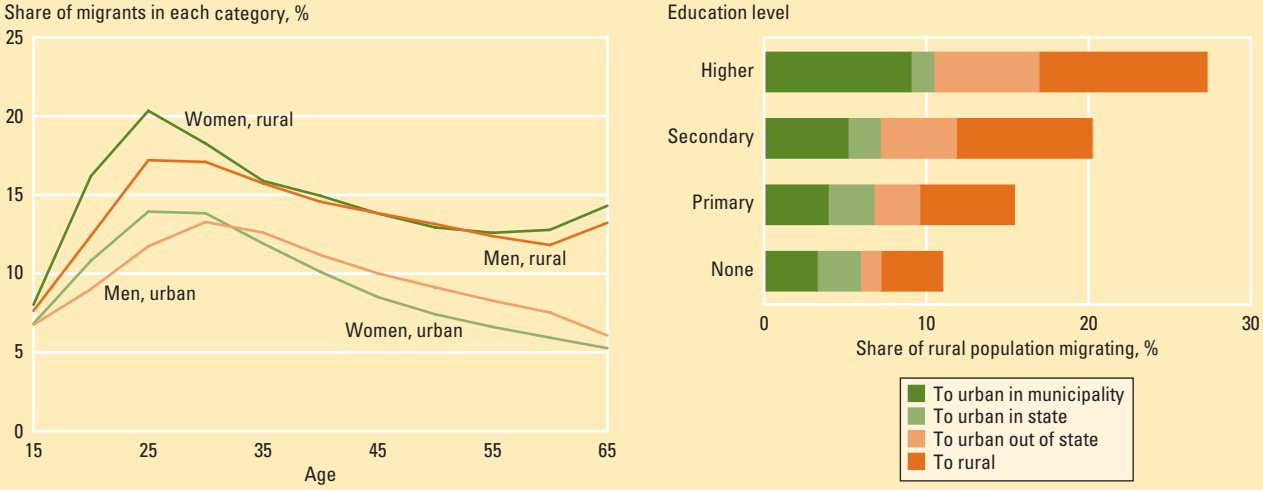
Almost a quarter of those ages 15–24 in 1990 had left rural Mexico by 2000, migrating to urban centers or abroad (see the figure above). Among the older cohorts, migration was also high, reaching 6–12 percent. Rural emigration is much more common among Mexican men than women (27 percent versus 21 percent) and among nonindigenous than indigenous (25 percent versus 18 percent). Until 2000 women were more prone to migrate to semiurban and urban centers within the country, and men to the United States. Indigenous migration has its own dynamics, responding to seasonal agricultural cycles within Mexico, though international migration among indigenous groups steadily increased in the 1990s.

Almost a quarter of the 15–24 cohort from 1990 had left rural Mexico by 2000



Source: Buck and others (2007)), from information in the 10 percent sample of Mexico census (1990 and 2000).
Note: Columns represent the same cohort of people observed in the 1990 and 2000 censuses with a 10-year difference in age. The population reported for 1990 is corrected for location and age-specific mortality rate during the decade. The residual change is thus due to net out-migration.

Young Brazilian women migrate more than young men—and the less educated migrate less



Source: Buck and others 2007; Lopez-Calva 2007; from information available in Brazil's 2000 census on residence in 1995.

Income from remittances sent by former household members often increases the land, livestock, and human capital base of rural household members who stayed behind. Remittances can also offset income shocks, protecting households' productive asset base. Evidence from the *Oportunidades* program in Mexico suggests that public transfers can similarly lead to investments in productive activities and risk coping.[28]

Private and public transfers account for a surprisingly large share of rural income, particularly in transforming and urbanized economies. In some countries there have been major increases in transfers. In Bulgaria, households became more dependent on public transfers as government spending on social protection rose to offset economic hardships. In Brazil and Mexico, conditional cash transfers have become important for rural household income and are major contributors to rural poverty reduction.

Urban-to-rural migration highlights agriculture's role as a safety net, showing that many urban residents are still part of a broader rural kinship network. During the 1997 financial crisis in Indonesia and Thailand, and during the early transition years in the Caucasus and Central Asia, reverse migration helped people deal with economic shocks. There is also evidence of return migration in parts of Africa, related to economic shocks and AIDS. Agriculture thus provides "farm-financed social welfare" when public welfare services are deficient or nonexistent.[29]

Household behavior when markets and governments fail: rational, despite appearances

Rural men and women determine their livelihood strategies in a context of failed markets. Many markets in rural settings do not support efficient outcomes because of high transaction costs, insufficient and unequal access to information, imperfect competition, externalities, and state failures to provide public goods. With such market and state failures, initial asset endowments affect the efficiency of resource use and thus the well-being of households.

Living in a poor area can itself be a causal factor in perpetuating poverty because of geographical externalities.[30] The strategies of rural households are conditioned by the agricultural potential and natural resources available in their environment (chapter 2). Recent work on the geography of poverty sheds light on how these factors relate to household strategies and rural poverty (see focus A). Population density and access to markets, strongly correlated with transaction costs and asymmetric information, also determine household strategies. With good information, farmers are more equipped to make relevant decisions and learn about additional diversified employment opportunities. New information technologies can help address some of these information disadvantages (chapter 7).

When market failures coincide, households need to consider their consumption needs in making production decisions, and vice versa. This can explain many aspects of rural households' livelihood strategies, including some that might otherwise appear irrational.[31] Consider a few examples.

Farm households that produce food and cash crops will not always be able to respond to an increase in the price of the cash crop. When transaction costs in food markets are high and labor markets function imperfectly, a household might not be able to employ more labor to increase cash-crop production while maintaining the necessary food production for its own food security.[32] It is thus confined to responding to price incentives through technological change or more use of fertilizer, but capital market imperfections can limit these possibilities. As a result, the response to price incentives in cash crops is often limited, shrinking the benefits from price and trade policies that increase producer incentives (chapter 4).[33]

Market imperfections, combined with differences in asset endowments, including social capital, can also shed light on technology adoption (chapter 7). Evidence from Ghana, India, and Mozambique suggests that social learning may be important for adopting new technologies. Farmers' decisions are influenced by the experiences of farmers in their social networks, which

can help reduce asymmetric information on the new technology. New technologies often involve uncertainties about appropriate application or suitability for a particular environment. Consequently, adoption patterns can be slow, as individual farmers gain from waiting and learning from others' mistakes. Sometimes all farmers can deem the evaluation costs too high or uncertain, choosing to stay with the status quo, behavior that can appear inefficient to an outsider. Recent evidence from Kenya suggests that households might also have a saving commitment problem and thus do not put money aside after the harvest to buy fertilizer for the next season, another explanation for the limited adoption of otherwise profitable strategies.[34]

The household is the domain of complex interactions of cooperation and power plays. A woman's power is affected by her participation in economic activity, which itself depends on her asset endowment (including human capital) and her access to the household's assets. Intrahousehold differences in control over assets and cash can thus affect cultivation and technology decisions, as well as a household's market orientation. A study in southern Ghana found that soil fertility, tenure security of plots, and participation in the credit market were lower for women than for men; consequently, women were much less likely to plant pineapples than men. Pineapples were more profitable than the subsistence crops that women tended to cultivate. Evidence from Burkina Faso suggests that output of crops grown by both men and women could increase by 6 percent if some labor and manure were reallocated to women's plots.[35]

To the extent that these factors prevent households from maintaining soil fertility or otherwise adopting sustainable practices, they can have important repercussions for natural resource management. Unsustainable outcomes can also be the result of collective action problems, with the "tragedy of the commons" looming where household livelihoods depend on open access to resources (chapter 8). Empirical evidence suggests, however, that cooperative resource management often emerges in such settings.[36]

In many cases, collective action alone cannot correct market failures; that is a crucial role for policies and the state. Yet in many developing countries, the state has failed to play this role. To the contrary, many policies have been detrimental to rural households' livelihoods. Taxation of the agricultural sector, policy biases favoring large farms, and failure to provide education and health services severely constrain the potential of rural households to pull themselves out of poverty through the farming pathway. Reversing such policies can enhance existing household strategies or open the potential for new and successful ones.

Mutual influence of household strategies and social norms

Social norms often have a strong influence on household strategies and on the roles of men and women in the household. In Côte d'Ivoire, social norms not only dictate that food crops should be grown by women and cash crops by men, but also influence the use of profits from different crops for household expenditures.[37] Social norms often dictate that most of the childrearing, cooking, and household chores are the responsibilities of women, limiting their potential to take advantage of new farming, labor, or migration opportunities, reinforcing inequalities. Or increased labor force participation by women, combined with these traditional roles at home, mean much longer workdays for women than for men.

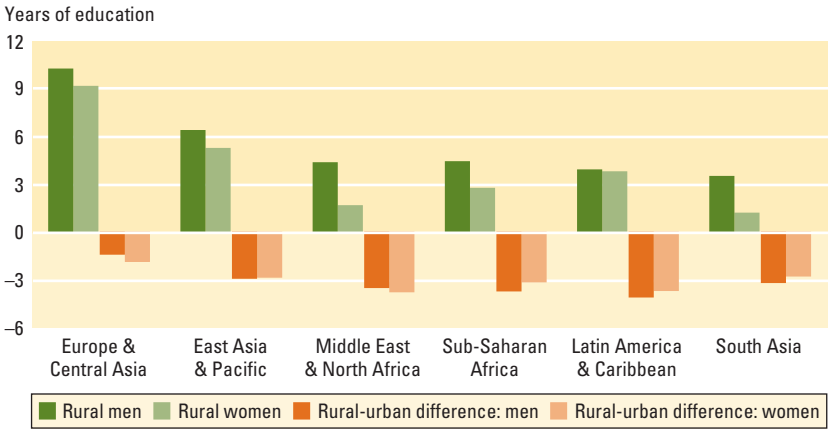
Yet in some contexts women's wage jobs, and the income they generate, can shift the balance of power and work inside the house. Women's employment in the growing export flower industry in Ecuador increased the participation of men in housework.[38] Traditional time allocation patterns can also be affected when households move to more market-oriented cash crop production. Gender divisions between crops can shift with new technology, as occurred with rice growing in The Gambia. In Guatemala, labor shortages associated with high-value export production forced women to reduce the time they devoted to independent income-producing activities

or to cultivating crops under their own control. Labor constraints also encroached on the time that women could allocate to food crops. Where men control income from cash crops, power imbalances in the household can be reinforced when new market opportunities open.[39] Shifts in household strategies that might lead to pathways out of poverty are not gender neutral.

Rural household asset positions: often low and unequal

Household asset positions determine household productivity. More generally, household asset endowments condition livelihood strategies. Education and health status affect a person's potential to engage in high-value nonfarm jobs as well as the returns on agriculture. Education might facilitate learning about new technologies, and given the physical intensity of most agricultural labor, health and nutrition can affect agricultural productivity. The size and quality of landholdings condition crop and technology choices and the potential of producing marketable surplus. Households without any access to land are excluded from the farming pathway. Owning work animals can affect the timing of cultivation practices. And livelihood strategies rely on social networks for trust, social learning, and collective action.

Figure 3.5 Rural-urban gaps in educational attainment are large



Source: WDR 2008 team.
Note: Average education levels for adult populations, 25–64 years old, for countries in each region. Calculations based on 58 countries (excluding China and India) with recent household survey data with information on years of education, weighted by 2000 population. See Background Note by WDR 2008 team (2007) for details.

Lacking a minimum asset endowment can thus trap households in long-term poverty. The asset endowments of many rural households have been low for generations, explaining the persistence of rural poverty, and the tighter asset squeeze on many smallholders challenges their survival. Increasing the asset base of the poor is a major challenge for policy makers in implementing an agriculture-for-development strategy.

Human capital endowments

Rural households' human capital endowments tend to be dismally low. Rural-urban gaps in educational attainment and health outcomes remain large in most regions. Regional averages for Sub-Saharan Africa, South Asia, and the Middle East and North Africa show that rural adult males have about 4 years of education, and rural adult females have 1.5 to 4 years (figure 3.5). Only in Europe and Central Asia are education levels notably higher. Inequality in access to education by ethnic group is also high in many countries. Differences between rural and urban areas are even larger, with adult males in rural Africa and Latin America having about 4 years less education than their urban counterparts (figure 3.5).

In some countries, such as Mexico, adult education programs have boosted rural literacy rates. In many countries school enrollment rates have increased considerably over the last decade. Yet differences in school attendance for children by wealth categories and ethnic groups remain large, and gender differences are still significant in most countries. In Latin America, the returns to education were lower for indigenous groups. Moreover, the quality of education is often drastically lower in rural areas (chapter 9).[40]

Access to quality health services is also much lower in rural areas. In many countries the imbalance between rural and urban areas in skilled health workers is extreme. In Africa only half the rural population has access to improved water or improved sanitation, and in Asia only 30 percent.[41] Poor health reduces agricultural productivity, and some agricultural prac-

tices contribute to health problems such as malaria, pesticide poisoning, and zoonotic diseases (see focus H).

AIDS takes a heavy toll on rural populations in Africa, with mortality among young adults rising sharply. Life expectancy is declining in many countries—in Malawi, for example, from 46 years in 1987 to 37 years in 2002. HIV incidence early in the epidemic is often higher for the educated, decimating human capital.[42] AIDS also reduces adults' capabilities to work, diverts the labor of others to caregiving, and breaks the intergenerational transmission of knowledge. All these factors can result in reduced agricultural production. Evidence from rural Kenya suggests that antiretroviral treatment can sustain the adult labor force, leading to less child labor and better child nutrition outcomes.[43]

AIDS can also severely affect the demographic profile of rural populations through the direct effects on mortality and through migration that helps people cope. In its 2003 *World Health Report,* the World Health Organization (WHO) (2003) reported a shift of orphans to rural areas.[44] Analysis based on population censuses suggests that African countries with high HIV prevalence (Botswana, Swaziland, and Zimbabwe) have higher dependency ratios than would be predicted for their level of development.[45] These changes in rural household composition are likely to affect household income strategies, as well as the potential of rural households to benefit from agricultural and rural growth. The changes also have implications for the role of subsistence farming for household survival (box 3.4).

Land pressures and the persistence of bimodal land distributions affect household landholdings

As land gets divided through inheritance in a growing population, farm sizes become smaller. In India the average landholding fell from 2.6 hectares in 1960 to 1.4 hectares in 2000, and it is still declining. Panel data that followed household heads and their offspring in Bangladesh, the Philippines, and Thailand over roughly 20-year periods show declines in average farm sizes and increases in landlessness. In many high-population-density areas of Africa, average farm sizes have also been declining. Such land pressure in economies still heavily reliant on agriculture is a major source of rural poverty, and it can also produce social tensions contributing to civil conflict.[46] This is true even if the division of landholdings may have an equalizing effect, as the declining land Gini coefficients (less inequality) for India, Malawi, and Tanzania suggest (see table 3.3).

By contrast, agricultural land is still expanding in some African and Latin American countries, and farm sizes are increasing (table 3.3 and chapter 2). In cash-cropping regions of Mozambique, such area expansion was found to reduce poverty.[47] Greater access to land for the rural poor, particularly where off-farm income and migration opportunities are lacking, is a major instrument in using agriculture for development.

In Latin America and some countries of Africa and South Asia, unequal land access is often perpetuated through social mechanisms—leaving many households, often ethnic minorities or indigenous people, without access to land or with land plots too small to meet their needs. Most of the land is in large farms, while most farms are small.[48] This bimodal pattern has been increasing in Brazil over the last 30 years, where the number of medium-size farms declined while the numbers of both small and very large farms increased. Small farms control a declining share of the land, while large farms control a growing proportion (figure 3.6). In Bangladesh the number of farms doubled in 20 years, and the number of farms smaller than 0.2 hectares increased more than proportionally—but most of the land is in larger farms.[49] Moreover, a large share of rural households in these regions do not have any access to land.[50] Land concentration thus contributes to the asset squeeze on smallholders and landless households.

Mechanisms that perpetuate land inequality include segmented land markets when property rights are insecure,

BOX 3.4 *Returning to the farm in Zambia—subsistence agriculture, AIDS, and economic crisis*

Cohort analysis with the Zambia census data sheds light on changes in the age composition of the urban and rural populations in a country with high HIV prevalence rates. The most striking observation is the high mortality rate between 1990 and 2000. Because international migration is very low, the declining size of each cohort, indicated by the attrition rates in both urban and rural areas, indicates high mortality.

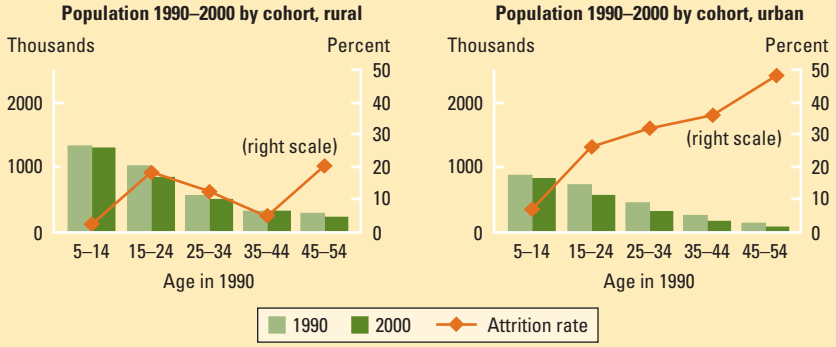
In urban Zambia, large population declines have occurred across all age groups, except the youngest. This contrasts with rural Zambia, where declines are especially large among young adults (19 percent for those 15–24 in 1990), indicating high mortality rates for this group.[51] Similar population analysis also suggests higher mortality rates among the literate population, confirming trends observed elsewhere in Africa.

Economic shocks that induced domestic migration help explain the differences between rural and urban patterns. In 2000 many more rural residents, of all age groups, reported having moved from the urban areas. By contrast, fewer urban residents had rural origins, particularly among older age groups (figure below). This indicates that net migration reversed from rural-to-urban in 1990 to urban-to-rural in 2000. Rural-to-urban migration slowed considerably between 1990 and 2000, but urban-to-rural migration increased. These patterns have been linked to the dearth of employment opportunities in towns and cities and the stagnation in the (largely urban) copper mining industry triggered by a global slump in copper prices.

Another explanation of the rural-urban differences in attrition rates among adults is return migration by HIV-affected people. A higher proportion of rural households has elderly household heads (12.9 percent versus 4.8 percent in urban areas). These households rely more on subsistence agriculture and have considerably less access to income from nonfarm sources, including transfers, than other rural households. The majority of the rural elderly households have (AIDS) orphans living with them (on average, 0.8 orphans per elderly rural household).

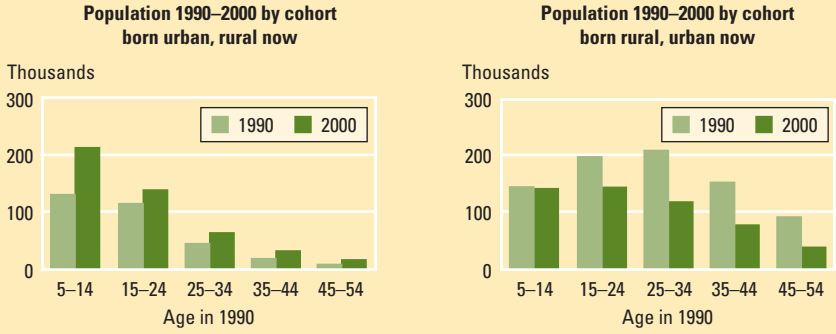
Source: Potts 2005; World Bank 2005p; calculations of WDR 2008 team, based on Zambia population census.

Following 1990 population cohorts to 2000 shows high mortality rates, particularly among young adults



Source: WDR 2008 team, based on Zambia population census.
Note: Columns represent the same cohort of people observed in the 1990 and 2000 censuses with a 10-year difference in age. The attrition between the two observations includes both net out-migration and death. Ages refer to cohort ages in 1990.

Migration patterns have reversed, with a recent increase in rural-to-urban migration



Note: Columns represent the number of people from the same cohort of age and born in urban (rural) areas that lived in rural (urban) areas in 1990 and 2000. The difference between the two observations includes both migration and death.

and unequal access to capital and other input or output markets. More generally, the inequality in many rural societies is perpetuated by elite capture in public services; intergenerational transfers of poverty through low education, ill health, and poor nutrition; and a deeply entrenched culture of poverty (box 3.5).[52]

Women's access to land is often limited by unfavorable marital and inheritance laws, family and community norms, and unequal access to markets. Women are less likely to own land, and female landowners tend to own less land than men. Evidence from a sample of Latin American countries shows that only 11 to 27 percent of all landowners are women. In Uganda women account for the largest share of agricultural production but own only 5 percent of the land, and they often have insecure tenure rights on the land they use.[53]

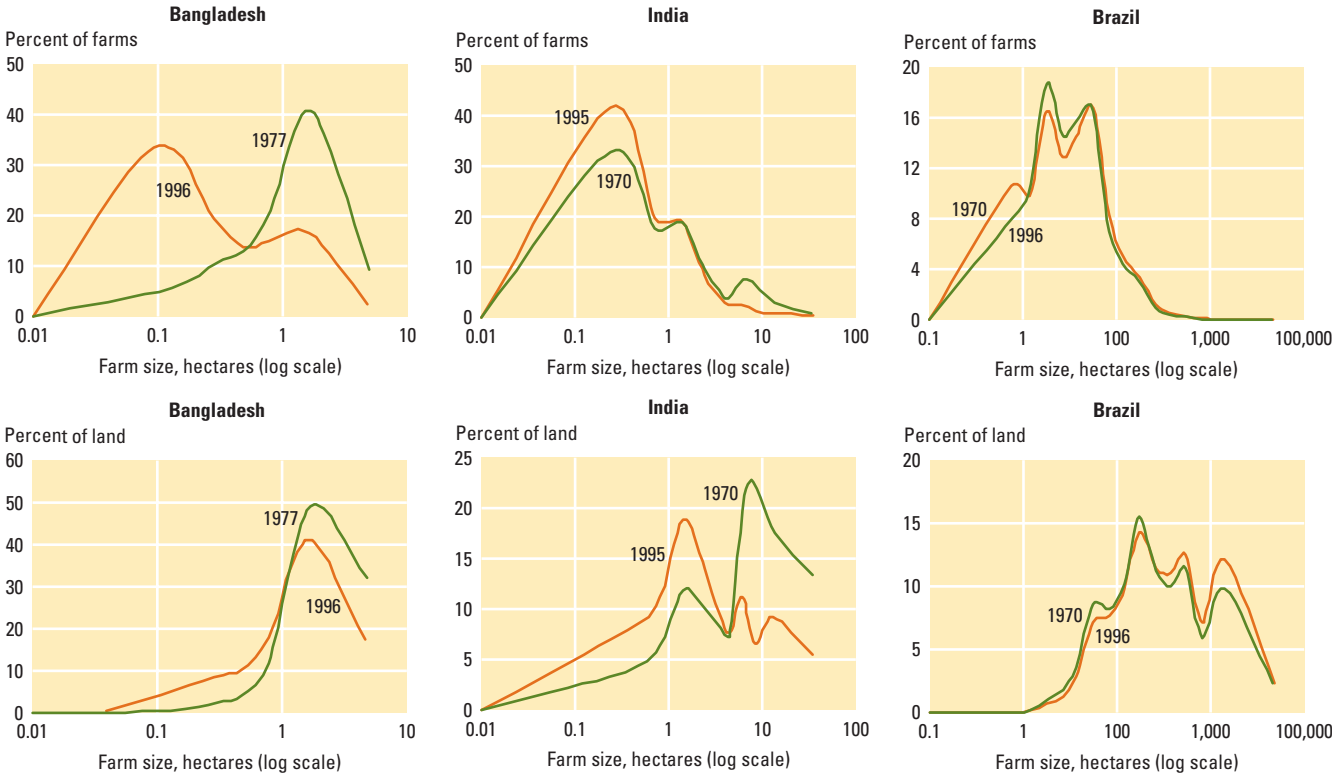
Country examples shed light on some of the underlying mechanisms. Until a recent law change, a woman in Nepal could not

Table 3.3 Changes in farm size and land distribution

Country	Period	Land distribution (Gini) Start	Land distribution (Gini) End	Average farm size (hectares) Start	Average farm size (hectares) End	Change in total number of farms %	Change in total area %	Farm size definition used[a]
Smaller farm size, more inequality								
Bangladesh	1977–96	43.1	48.3	1.4	0.6	103	–13	Total
Pakistan	1990–2000	53.5	54.0	3.8	3.1	31	6	Total
Thailand	1978–93	43.5	46.7	3.8	3.4	42	27	Total
Ecuador	1974–2000	69.3	71.2	15.4	14.7	63	56	Total
Smaller farm size, less inequality								
India	1990–95	46.6	44.8	1.6	1.4	8	–5	Total
Egypt	1990–2000	46.5	37.8	1.0	0.8	31	5	Total
Malawi	1981–93	34.4	33.2[b]	1.2	0.8	37	–8	Cultivated
Tanzania	1971–96	40.5	37.6	1.3	1.0	64	26	Cultivated
Chile	1975–97	60.7	58.2	10.7	7.0	6	–31	Agricultural
Panama	1990–2001	77.1	74.5	13.8	11.7	11	–6	Total
Larger farm size, more inequality								
Botswana	1982–93	39.3	40.5	3.3	4.8	–1	43	Cultivated
Brazil	1985–96	76.5	76.6	64.6	72.8	–16	–6	Total
Larger farm size, less inequality								
Togo	1983–96	47.8	42.1	1.6	2.0	64	105	Cultivated
Algeria	1973–2001	64.9	60.2	5.8	8.3	14	63	Agricultural

Sources: Anríquez and Bonomi (2007). Calculations based on agricultural censuses.
a. Total land area, agricultural (arable) land area, or cultivated (planted) crop area.
b. Inequality obtained from the Malawi 2004/05 household survey.

Figure 3.6 Farm size distributions are often bimodal



Source: Estimations based on agricultural census (Anríquez and Bonomi 2007).
Note: Farm size in log scale.

BOX 3.5 *New technologies and positive discrimination policies reduce social inequalities in India*

Inequalities across cultural, social, and ethnic groups often reflect differences in access to economic opportunities. Consider the persistence of caste-based inequalities in the Indian economy. Members of underprivileged "scheduled" castes and tribes typically live in sub-habitations of a village, geographically distinct from the main village. Residential segregation means that the public goods consumed by members of scheduled castes and tribes—such as sanitation facilities, drinking water, local roads, and even schools—are distinct from those consumed by better-off castes and are generally of very poor quality.

Governments can reduce inequalities by targeting funds toward areas populated by the poor. Indeed, many Indian government programs require funds to be spent on scheduled-caste habitations. Recent research suggests that such mandates ensure a higher level of investment in poor habitations. However, it also shows that these policies cannot significantly reduce the prevailing bias of village governments to devote far more resources to the main village complexes.

India's recent shift to the *panchayat* system of local government includes reserved council seats for women and members of scheduled castes and tribes. The new emphasis on participatory and community approaches has created possibilities for marginal groups to gain power, challenging cultural norms while shifting structures of traditional authority.

New technologies that link villages with world production, consumption, and governance further reduce the dependence on traditional norms. Television and communications have changed rural consumer preferences. Technological changes in agriculture, information technologies, trade, and transportation have expanded opportunities for many rural people. The access to new knowledge does not necessarily correlate with traditional social hierarchies, so it can help break the traditional inequality traps. But it can also lead to new inequalities as access to information and capital come to matter more than traditional norms.

Sources: Kochar 2007; Rao 2007.

inherit land from her parents. In Malawi widows can lose their land from land grabbing by the husband's family. Women's land rights under customary tenure regimes are also much weaker than men's. Evidence from Ghana suggests that shifts to individual ownership in such contexts can sometimes strengthen women's land rights. Yet in other cases, titling programs, by conferring titles to the male household head, contribute to the breakdown of customary systems that helped guarantee married women's access to land.[54]

Livestock: a key asset for the poorest, particularly in arid and semiarid settings

Livestock is often the largest nonland asset in rural household portfolios. In Burkina Faso and Ethiopia, livestock accounts for more than half of rural households' wealth. In arid and semiarid settings of Africa and Asia, livestock can offer the only viable household agricultural strategy (box 3.6). In such contexts, household welfare depends on herd size and the shocks that might affect it. The rapidly growing demand for livestock products in developing countries reinforces the value of livestock as part of household asset portfolios and its potential to reduce poverty.[55]

In 14 countries analyzed, the majority of rural households own some livestock, with shares above 80 percent in Albania, Ecuador, Nepal, and Vietnam. Even among the poorest households, more than 40 percent own livestock, except in Pakistan. Many livestock holdings consist of small animal species; fewer than 40 percent of rural households own cattle. The share of livestock owned by the top fifth of livestock holders varies between 42 percent and 93 percent, showing that livestock holdings tend to be quite unequal. Indeed, these inequalities are similar to those for landholdings.[56]

Differential access to formal and informal social capital

Membership in formal and informal organizations—and in community or ethnic networks—is a major asset of the rural poor, important for access to input and output markets, insurance, trust in transactions, and influence over political decisions. Social networks can also foster technology adoption through social learning. Exclusion from such networks can severely limit the choices of many, and the poorest are most likely to be excluded. Social capital is not only important for farmers; it also determines opportunities in the nonagricultural sectors (for traders or for job referrals) and for migration. For agricultural workers in (often isolated) large estates in Sri Lanka and elsewhere, the lack of networks is a major constraint on upward mobility.[57]

Producer organizations can be part of the social capital of many smallholders, contributing to smallholder competitiveness. Between 1982 and 2002, the proportion of villages with a producer organization rose from 8 percent to 65 percent in Senegal and from 21 percent to 91 percent in Burkina Faso. Overall, 69 percent of Senegal's rural households and 57 percent of Burkina Faso's are now members of producer organizations. Data for other African and Latin

American countries, although fragmented, also indicate a rapid increase in the number of such local organizations.[58]

Exclusion from formal networks typically affects women more than men, and women are less likely to be members of producer organizations, their membership constrained by cultural norms. But there are exceptions. In Senegal women participate more than men in producer organizations. In Bangladesh and India, self-help and microlending groups consist primarily of women. In Andhra Pradesh, poverty-reduction programs reaching more than 8 million women have built on and enhanced such self-help groups, increasing the access to group loans and collective marketing for agricultural commodities and input supplies.[59]

BOX 3.6 *Pastoralists' precarious livelihoods*

Pastoralism and agropastoralism are the main agricultural production systems in dryland areas, supporting the livelihoods of 100 to 200 million people worldwide. The number of extremely poor pastoralists and agropastoralists is estimated at 35 to 90 million. More than 40 percent of the pastoralists live in Sub-Saharan Africa, 25 percent in Middle East and North Africa, 16 percent in East Asia, 8 percent in South Asia, and 4 percent each in Latin America and in Europe and Central Asia.

Itinerant herding, moving animals from place to place to follow water and pasture availability, has evolved over centuries and is well suited to sustaining life in areas where rainfall is unpredictable. Yet, pastoralist livelihoods remain closely linked to weather conditions and thus are particularly vulnerable.

Pastoral strategies of herd diversity, flexibility, and mobility reflect rational and crucial survival mechanisms in erratic environments. Such strategies can be enhanced by policy, and some Sahelian countries (Burkina Faso, Mali, Mauritania, and Niger) have been promoting policy reforms aimed at legally recognizing the rights of pastoralists and improving the management of rangeland resources. But recent efforts to set aside extensive areas of marginal lands as national parks and biodiversity reserves, particularly in Africa, pose new challenges to pastoralism.

Sources: Blench 2001; Rass 2006; Thornton and others 2002.

Pervasive risks and costly responses

Agriculture is one of the riskiest sectors of economic activity, and effective risk-reducing instruments are severely lacking in rural areas. Negative shocks can deplete assets through distress sales of land and livestock. It can take a very long time for households to recover from such losses. When income and asset shocks coincide, households have to choose between reducing consumption or depleting assets.[60] This suggests a role for policies to enhance household's ability to manage risk and to cope when hit by a shock.

Rural households often identify weather-related and health shocks as their biggest risks. The immediate production and welfare losses associated with drought can be substantial. In Kilimanjaro, Tanzania, farmers who reported rainfall patterns well below normal in the year prior to the survey experienced a 50 percent reduction in their agricultural revenues and a 10 percent reduction in their consumption. Illnesses and injuries in a family simultaneously reduce income because of lost time working and deplete household savings because of spending on treatment. Studies for Africa, Asia, and Latin America suggest that health shocks contribute to more than half of all descents of previously nonpoor households into chronic poverty. Farmers also worry about abrupt changes in rules for land tenure or regulations for trade; for them, the state can be an additional source of uninsured risk. Rural political violence and crime can also cause considerable farm productivity losses, as in Colombia.[61]

The lack of access to insurance and credit markets makes agricultural producers particularly vulnerable. Households thus often reduce their consumption risk by choosing low-risk activities or technology, which typically have low average returns. In rural areas of semiarid India, such self-insurance produces returns for the poor that are 35 percent lower than if they did not need to self-insure.[62]

Shocks can be idiosyncratic—when one household's experience is weakly related, if at all, to that of neighboring households—or covariate—when households in a same geographical area or social network all suffer similar shocks. Idiosyncratic shocks can arise from microclimatic variation, local wildlife damage or pest infestation, illness, and property losses from fire or theft. Such shocks can, in principle, be managed by insurance within a locale. By contrast, covariate shocks, arising from war, natural disasters, price instability, or financial crises, are difficult to insure locally and require some coordinated external response. Yet, even idiosyncratic risk often has large effects, indicating the potential for better local risk management.

Are agricultural risks increasing? Recent empirical evidence suggests that heightened volatility attributable to apparent increases in climate variability (drought, flooding, and other natural disasters) has been offset by reduced volatility from greater use of irrigation and livestock.[63] Yet the costs of each meteorological event or other natural disaster are rising, reflecting the expansion of population and cultivation into more vulnerable areas. Moreover, the economic costs of extreme weather events increase as production systems use more capital, unless that capital allows the use of risk-reducing technology. Higher investments can thus increase asset-risk exposure, one obstacle to expanding credit use by poor households. This also helps explain why many farmers who are not poor remain vulnerable to shocks in the absence of risk-mitigating measures.

Poor areas generally are also riskier. Prices tend to be more variable in more remote areas, often the poorest regions, because limited market access and greater costs of getting to market make it more difficult to offset local supply and demand shocks. Poor households also have fewer means to insure against bad weather, and they face more weather-related disasters—aggravated by inequality in the coverage and effectiveness of infrastructure. People in low-income countries are four times more likely to die in natural disasters than those in high-income countries.[64] Uninsured risks and poverty can thus create downward spirals of perpetual impoverishment.

Lack of insurance and asset depletion

The inability to protect a household from income and asset shocks can result in long-term consequences across generations through reduced investments in health, nutrition, and schooling. In many circumstances, recovering from a shock is slow and often incomplete by the time the next shock occurs. And after an income shock, the poor recover more slowly than the nonpoor. Households in an isolated community in Zimbabwe lost 80 percent of their cattle in the 1992 drought. By 1997, the average herd size recovered to 50 percent of predrought levels, but there was little recovery for households that lost their entire breeding stock.[65]

Coping with shocks often comes at the expense of investments in the next generation. In addition to the higher infant mortality rate in drought years, survivors are often stunted, which in turn affects future educational attainment and lifetime earnings. Rural households often also respond to low rainfall or unemployment shocks by withdrawing children from school or decreasing their attendance so that they can help at home and on the farm. Children taken out of school for even a short period are much less likely to return to school.[66]

Negative shocks can have differential effects along gender lines, and women (or girls) in poor households often bear the largest burden. Meeting current consumption after a shock can also degrade the environment at a cost of future livelihoods. Shocks can intensify pressures on common property, increase poaching and encroaching on protected areas, and augment conflicts between pastoral and farming communities.[67] So protecting rural households against uninsured risks is an area for greater policy attention (chapter 6).

Smallholder challenges to compete

The potential of agriculture to contribute to growth and poverty reduction depends on the productivity of small farms. The vast majority of farmers in developing countries are smallholders, and an estimated 85 percent of them are farming less than two hectares. In countries as diverse as Bangladesh, China, Egypt, and Malawi, 95 percent of farms are smaller than two hectares, and in many other countries the great majority of farms is under two hectares.[68] The literature linking household's asset endowments to agricultural productivity has long emphasized an inverse relationship between farm size and factor productivity. Both theory and empirical evidence have shown that such a relationship is common when imperfections in both land and labor markets are large.[69] The inverse relationship is

a powerful rational for land access policies that redistribute land toward smallholders, increasing both efficiency and equity.

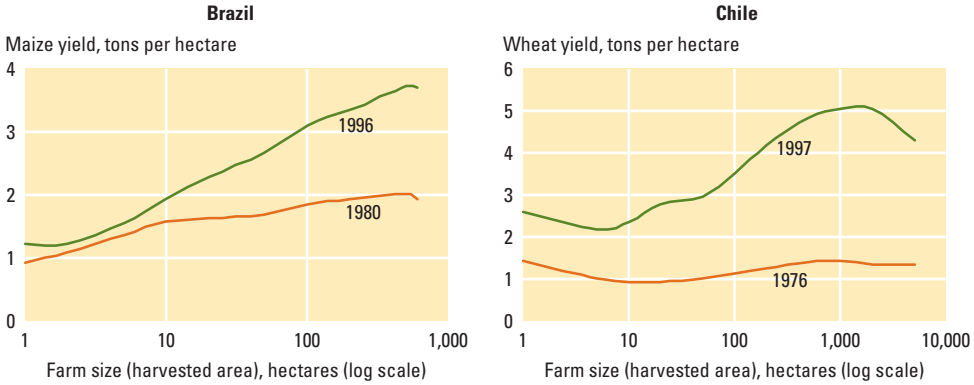
Smallholder farming—also known as family farming, a small-scale farm operated by a household with limited hired labor—remains the most common form of organization in agriculture, even in industrial countries. The record on the superiority of smallholder farming as a form of organization is striking. Many countries tried to promote large-scale farming, believing that smallholder farming is inefficient, backward, and resistant to change. The results were unimpressive and sometimes disastrous. State-led efforts to intensify agricultural production in Sub-Saharan Africa, particularly in the colonial period, focused on large-scale farming, but they were not sustainable. In contrast, Asian countries that eventually decided to promote small family farms were able to launch the green revolution. They started supporting smallholder farming after collective farms failed to deliver adequate incentives to produce, as in China's farm collectivization, or on the verge of a hunger crisis, as in India and Indonesia. Countries that promoted smallholder agriculture—for various political reasons—used agriculture as an engine of growth and the basis of their industrialization.

Even if small farmers use their resources more efficiently than larger farmers, there may still be disadvantages in being small. While smallholders have an advantage in overcoming labor supervision problems, other factors can erase their competitive advantage. Yields on land allocated to crops might be higher on larger farms, which tend to apply more fertilizer or other inputs. And the gap might be increasing over time. For example, gains in cereal yields on small farms are lagging behind gains on larger farms in both Brazil and Chile (figure 3.7).

Yield gaps can arise because imperfections in credit and insurance markets prevent small farmers from adopting more productive capital-intensive techniques or higher-value products. Evidence from Brazil indicates that price changes following market liberalizations favored technologically more advanced producers who were better able to cope with price and yield variability and deal with the demands of agroprocessing. Imperfections in capital and insurance markets, combined with transaction costs, can also prevent markets for land sales and rentals from allocating land to the most efficient users.[70] Moreover, imperfect competition in those markets might favor land concentration in larger farms. These complexities indicate the need to jointly consider policies targeting land, capital, and risk for smallholders (chapter 6).

Moreover, while there may be constant returns to scale in production, economies of scale in the "new agriculture" often are the key for obtaining inputs, technology, and information and in getting products to the

Figure 3.7 Yields on small farms lag behind large farms in staples in Brazil and Chile



Source: Anríquez and Bonomi 2007.

market (chapter 5). As agriculture becomes more technology driven and access to consumers is mediated by agroprocessors and supermarkets, economies of scale will pose major challenges for the future competitiveness of smallholders.

These different mechanisms can all reverse the small farm labor advantage, or make it irrelevant, leading to a potential decline of the family farm (box 3.7). The perceived "crisis" in smallholder agriculture is epitomized by the rash of suicides of heavily indebted farmers in India, the long-term stagnation of productivity of food crops in Africa, the role of poor (indigenous) farmers in the political instability of many Latin American countries, and the increasing rural-urban income disparities in South and East Asia. But there are many policy instruments to help smallholders increase their competitiveness, as long as governments do not tilt the playing field against them.

Smallholder entrepreneurs and cooperation

Heterogeneity in the smallholder sector implies that a group of entrepreneurial smallholders is likely to respond when markets offer new opportunities. Improved access to assets, new technologies, and better incentives can allow more smallholders to become market participants in staples and high-value crops.

Smallholders can act collectively to overcome high transaction costs by forming producer organizations (chapter 6). Cooperation between larger commercial farmers and smallholders is another possibility. Smallholders sometimes can also benefit from economies of scale in input or output markets by renting out their land and working on the larger farms.[71] Increasing the bargaining power of smallholders in this type of arrangement can help guarantee that benefits are shared by smallholders and the larger farms.

Conclusions

Three powerful and complementary pathways out of poverty are smallholder farming, off-farm labor in agriculture and the rural nonfarm economy, and migration. The following chapters discuss policies and programs that can open and widen these pathways for the rural poor by increasing their asset holdings and by improving the context that determines the level and volatility of the returns on assets. Chapters 4 to 8 explore how farming can be made more effective in providing a pathway out of poverty. Chapter 9 looks into the possibilities offered by the agricultural labor market, the rural nonfarm economy, and migration.

BOX 3.7 *Are farms becoming too small?*

Population pressures, unequal landholdings, and inheritance norms favoring fragmentation are leading to rapid declines in farm sizes in many parts of Asia and Africa. In China and Bangladesh, average farm size is about 0.5–0.6 hectares, and in Ethiopia and Malawi about 0.8 hectares. Have farms become "too small"?

The farm-size debate is motivated by a number of concerns. First, some argue that the inverse farm size–efficiency relationship might not hold at very small farm sizes, or that even if such farms are efficient, they might be too small for rural households to escape poverty based on the income of the farm alone. Others argue that small farms disguise unemployment if labor markets do not work properly. The relevance of these arguments depends in part on the availability of alternative income sources and on the safety-net value of small farms.

A related question is whether declining farm sizes widen rural-urban income gaps. With urban wages increasing in many Asian countries, labor productivity in agriculture might have to increase to avoid widening the gap. One way of achieving such productivity gains might be through farm consolidation and mechanization.

Policies activating land rental and sales markets can promote such consolidation. Increases in land inequality and landlessness can then coincide with a pro-poor process of change, as in Vietnam, where rural economic development and greater diversification in the sources of income sharply reduced poverty. Conversely, tenure insecurity can prevent land reallocation through sales or rental markets, preventing such gains. In Japan, government intervention in land rental markets preserves small, inefficient farms. In China, greater tenure security has been advocated to facilitate moves to the nonfarm economy. Without such a policy change, the trend of declining farm sizes in China might continue.

In other places, policy-led land consolidation has been considered. The advantages are not always clear, however, because some households will lose their access to land.[72] But where consolidation occurs through the land rental market, win-win situations can occur. Alternatively, increasing the productivity of small farms—through high-value crops or higher-yielding technologies for food crops—can increase the incomes from small farms.

Sources: Anríquez and Bonomi 2007; Deininger and Jin 2003; Otsuka 2007; Ravallion and van de Walle forthcoming.

The heterogeneity of smallholders, some market oriented and some subsistence oriented, calls for differentiated agricultural policies that do not favor one group over the other, but that serve the unique needs of all households while speeding the passage from subsistence to market-oriented farming. Recent changes in the global food market, in science and technology, and in a wide range of institutions that affect competitiveness are creating new challenges for smallholder entrepreneurs. They are also opening new opportunities. By addressing these challenges and seizing these opportunities, smallholders can escape poverty through the farming pathway, especially when policies reverse traditional biases against the smallholder.