



## *Promoting economic opportunities for the poor*

Ensuring that the poor participate in and contribute to growth requires the adoption of appropriate economywide and sectoral policies and of measures to help the poor grasp new income-earning opportunities. This chapter examines policies that will:

- Encourage a pattern of growth that increases the efficient use of the assets owned by the poor
- Expand the access of the poor to land, credit, infrastructure, and productive inputs.

As noted in Chapter 3, there are strong complementarities among growth, poverty reduction, and human capital. Investment in human capital, which is critical for enabling the poor to seize expanded opportunities, is discussed in Chapter 5.

### **The pattern of growth and the incomes of the poor**

Most of the poor in developing countries depend on income from labor—from work on their own land, from wages, or from other self-employment. The countries that have succeeded in reducing poverty over the long term have encouraged broadly based rural development and urban employment, thereby increasing the returns to small-farm production and wage labor. Successful approaches to development, however, have varied according to the initial economic conditions. In Thailand in the 1960s and Kenya in the 1970s the rising productivity of small farms spurred growth in nonfarm incomes. In Malaysia in the 1970s expansion of urban employment played an equally important role.

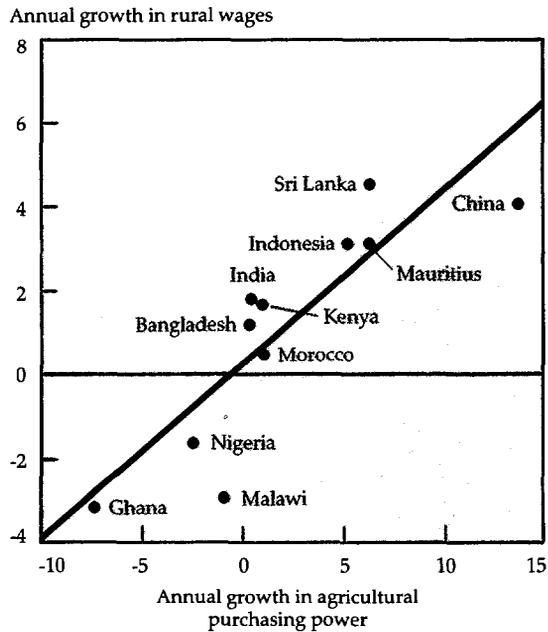
Since labor is an abundant resource, encouraging its use is generally consistent with rapid and efficient growth. Yet most countries have adopted policies that are implicitly biased against labor. In particular, although agriculture is the principal labor-intensive sector, almost all developing countries have taxed agricultural output. Governments have done this for two reasons: to finance public spending (it is administratively easy to tax agricultural output) and to protect manufacturing, especially in the early phases of industrialization. Country experiences suggest two conclusions.

- Successful rural development entails avoiding excessive taxation of agriculture, providing strong support for rural infrastructure, and making technical innovations accessible to small farmers.
- A rising urban demand for labor (in industry and services) plays an increasing role as incomes rise. Governments can foster urban job creation by avoiding severe distortions in product and factor markets and by providing suitable urban infrastructure.

### *Government policy and rural development*

The expansion of agriculture is the driving force behind effective rural development, which in turn lays the foundation for broadly based, poverty-reducing growth. The poor benefit directly if they are farmers, and they benefit indirectly from growth in demand for farm labor and for the products of the rural nonfarm sector. Especially in low-income countries, there is a strong association between growth in agricultural purchasing power and rural wages—a key welfare indicator for the

**Figure 4.1 Agricultural purchasing power and rural wages**  
(percent)



Note: The period covered varies from country to country but is early 1970s to mid-1980s except for Bangladesh and China, 1980-87, and Kenya, 1970-79.

rural poor (see Figure 4.1). Moreover, agricultural growth helps the rest of the economy. Typically (as noted in *World Development Report 1986*) countries with rapid agricultural growth have also had rapid industrial growth.

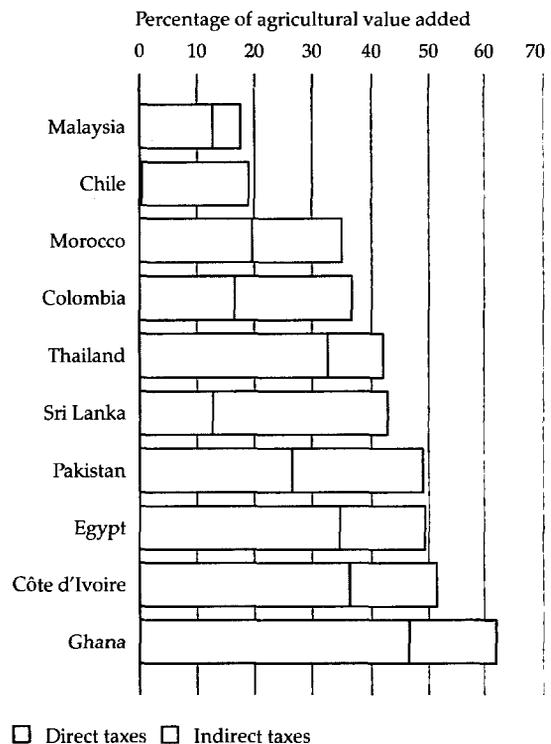
The main policies that affect agricultural performance are taxation and public support for agricultural development. In quantifying taxation it is important to take account of both direct taxes on agricultural products and the indirect taxes that are implicit in industrial protection and overvaluation of the exchange rate. As Figure 4.2 shows, these indirect taxes can add substantially to the overall tax burden.

The range of experience is wide, but countries that have performed well have usually taxed moderately and provided strong support. For example, in the 1970s total taxation of agricultural commodities in Malaysia was a relatively low 19 percent of the value of output (at international prices); government spending for direct support of agriculture was 10 percent of the sector's value added. Malay-

sia enjoyed an agricultural growth rate of 5 percent a year over that decade. Ghana, in contrast, taxed agricultural commodities to the tune of 63 percent and spent only 3 percent of value added on support. Its farm output fell by more than 1 percent a year.

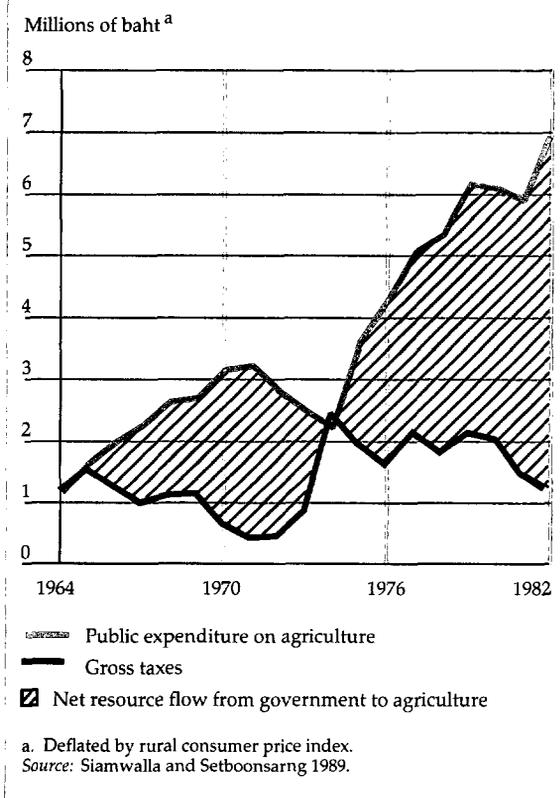
In some cases taxes can be offset by effective public support. Thailand's total taxation on agricultural commodities amounted to 43 percent of output value, with the burden falling mainly on rice and rubber. But substantial public support for infrastructure and services made up for these outflows. Figure 4.3 shows the pattern of gross and net flows to the sector. It excludes spending on

**Figure 4.2 Direct and indirect taxation of agriculture in the 1970s**



Note: Direct taxes are calculated as the difference between producer prices (in relation to the price of nonagricultural goods) and the relative border price at the official exchange rate. Indirect taxes are the additional reduction in relative prices attributable to the effects of industrial protection on the equilibrium exchange rate and on the prices of nonagricultural goods. Both direct and indirect taxes are expressed as a ratio of the prices without any distortion and at the equilibrium exchange rate. The results are weighted averages for those commodities for which taxes are reported in a given country.  
Source: Schiff and Valdés forthcoming.

**Figure 4.3 Net resource flows between the government and the agricultural sector, Thailand, 1964 to 1982**



rural roads and the effects of the country's indirect taxation (which is about 15 percent of value added), but the overall pattern is clear; substantial public spending led to net flows into the sector after the early 1960s. This spending supported expansion of the land frontier and crop diversification—generally toward less heavily taxed commodities such as cassava. Like Malaysia, Thailand was strikingly successful in reducing poverty.

A World Bank study of six African countries, "Managing Agricultural Development in Africa," offers further contrasts between good and bad performers. The countries with the most successful agricultural sectors (especially Cameroon and Kenya) were also the best performers in GDP per capita and manufacturing output. These countries taxed farming less severely than the others, partly by avoiding acutely overvalued exchange rates. They also invested in an institutional and infrastructural environment that supported diversified agricultural growth, much of it in the small-farm

sector. By contrast, Nigeria, Senegal, and Tanzania sought capital-intensive industrialization. They imposed heavy direct and indirect taxes on farming and provided only weak public support for infrastructure and institutions. Like Ghana in the 1970s, they failed dismally to spur growth in agricultural output and in nonfarm output and total labor demand.

Policy within the agricultural sector influences not just the growth of the sector but also the extent to which this growth reduces poverty. When product pricing and support are biased in favor of large farmers, the poor benefit less. For example, policy in Malawi contains biases in the form of pricing that discriminates in favor of large estates and against small farmers in the tobacco sector. Small-farm tobacco production has grown only slowly. In Zimbabwe before independence the entire system of infrastructure and services was intended to help large farmers. When this bias was partially redressed in the 1980s, smallholder maize and cotton production grew rapidly. In many Latin American countries, too, support services are designed mainly in the interests of large farmers.

Other aspects of policy may add to the bias against labor. Credit subsidies, for instance, foster excessive mechanization, and research suggests that they have reduced the demand for farm labor in India. A highly unequal land distribution also limits the extent to which the poor gain from agricultural growth. Brazil shows that transfers of resources to the sector can fail to have much effect on poverty if policy within the sector is biased against the poor and if the poor have little access to land (Box 4.1).

**INFRASTRUCTURE AND TECHNOLOGY.** Public programs to provide services, infrastructure, research, and technology for agriculture have a decisive influence on the level and pattern of agricultural growth and on private investment in the sector. A study of fifty-eight countries during 1969–78 found that a 1 percent increase in irrigation coverage was associated with a rise in aggregate crop output of 1.6 percent and that a 1 percent increase in paved roads was associated with a rise in output of 0.3 percent. Investments in infrastructure also help to improve and maintain natural resources. Cost-effectiveness, however, is important. An analysis of completed Bank-supported projects to create infrastructure in agriculture found that economic rates of return averaged 17 percent—well above the 10 percent used to qualify a project as successful. (In Africa, however, performance is much

#### **Box 4.1 Agricultural policies in Brazil favor large farmers**

Brazil has promoted agriculture and has achieved rapid growth in the sector. But its record on poverty is disappointing. One reason is that biases within the agricultural sector, notably in taxation and subsidized credit, favor large farmers and work to the disadvantage of labor. These biases interact with the highly inequitable initial land distribution to reduce the gains to the poor from growth. Brazil vividly demonstrates that promoting agriculture is not enough. Policies within the sector also matter.

##### **Land and agricultural taxation**

Brazil's income tax greatly favors agriculture in relation to other sectors, but only the rich can reap the benefits. Through special provisions in the income tax code, corporations can exclude up to 80 percent of agricultural profits from their taxable income, and individuals can exclude 90 percent. Fixed investments can be fully depreciated in the first year and can even be depreciated two to six times over. This, together with high inflation, encourages corporations and the rich to overinvest in land. The result has been the accumulation of large landholdings and increases in land prices that exceed growth in land productivity. The poor do not benefit from the tax breaks (they pay no income tax), and they cannot afford to buy land. Many move to frontier areas in search of unclaimed land.

A progressive land tax could offset the bias in the

income tax. Brazil tried this but failed because of widespread evasion and many exceptions. One such exception, intended to encourage land use, reduces the tax by up to 90 percent if owners use the land to graze cattle. This promotes the conversion of forestland to uneconomic livestock ranching, reduces the demand for labor, and has harmful environmental consequences.

##### **Subsidized credit**

Agricultural credit has been exceptionally distorted in Brazil. Until recently, real interest rates on official credit were negative, and real interest rates on loans for agriculture were lower than in the nonagricultural sector. The difference in credit terms between sectors has been capitalized in the price of land. Although subsidies raise profits in agriculture, they have mainly benefited large farmers and have encouraged excessive mechanization, again reducing the demand for unskilled labor. Poor people who lack land titles have not benefited from credit subsidies.

Agricultural policies in Brazil have reduced labor demand and have made it almost impossible for a poor person to buy land and become a farmer. Opportunities for unskilled workers to acquire skills by becoming long-term workers have been substantially reduced by subsidized mechanization.

lower because of weak institutions and poor project implementation.)

Better infrastructure can lead to increased productivity, technical change, and strengthened market linkages. Irrigation and water control have been crucial for higher yields (through the adoption of modern varieties and multiple cropping) and reduced variability of output in the past twenty years in South and East Asia. And although landowners are likely to enjoy the biggest absolute gains, the income gains from infrastructure can be widely dispersed. In Andhra Pradesh, India, for example, the monthly per capita expenditure for small farm units and wage-earning households in 1983 was 35 percent higher in irrigated than in nonirrigated districts. A study of Bangladeshi villages found that infrastructural development is associated with a rise in the incomes of all households, including the poor and landless (Box 4.2). Much of the increase was a result of changes in the way labor is used.

Infrastructural projects benefit many, but they

can sometimes affect certain subgroups adversely unless planners anticipate and prevent such potential effects. For instance, thirty-nine dam projects approved for financing by the World Bank in twenty-seven countries during 1979-85 brought considerable benefits to people in the command areas but also entailed relocation of about 750,000 inhabitants of reservoir areas. Such displacement can cause profound distress, disruption of social and productive structures, increased poverty, and environmental damage. The issue has not always been adequately addressed by governments and aid agencies. During the 1980s, however, the treatment of populations displaced by infrastructure projects improved considerably. Resettlement plans are becoming integral components of the projects, which also include funds for acquiring land and providing infrastructure and services for the resettled areas.

Technological change is vital for agricultural growth. The record of the past thirty years clearly supports the argument for public funding for agri-

#### **Box 4.2 Infrastructural development and rural incomes in Bangladesh**

A study of sixteen villages in Bangladesh shows how the development of infrastructure—roads, electric power, banks, markets, schools, and health centers—affects the incomes of rural households. The study divided the villages into those that had and had not benefited from the provision of public infrastructure. With other factors controlled, the study found that greater infrastructural development was associated with a one-third increase in average household incomes. Crop income increased by 24 percent, wage income by 92 percent, and income from livestock and fisheries by 78 percent. These three changes largely benefited the poor. Income from nonfarm businesses increased by 17 percent; this largely benefited the nonpoor.

Roads, electricity, and other economic services encouraged the production of new farm products (including perishable commodities) and higher output in transport, construction, services, and small-scale industries. All this had a substantial effect on the pattern of labor demand. Although households worked roughly as many days a year in developed as in undeveloped villages, in the developed ones they spent less time on family labor, which had low implicit returns, and much more on wage labor, especially in the relatively high-paying nonfarm sector. Poor households with few physical assets, including landless households, gained substantially.

cultural research and for dissemination of new technologies in small-scale production. Many in the 1970s thought that the Green Revolution would do little or nothing to help the poor, but recent appraisals suggest that most of these fears were unfounded. In Asia and Latin America (the main areas in which the new varieties were adopted) small farmers and laborers alike have benefited—although most studies have found that small farmers adopt new varieties with a lag of three years or so because they are less willing or able to take risks. Better access to new varieties as well as to water, chemical inputs, and credit has encouraged small farmers to switch more quickly. Extension services designed for small farmers have also helped. Where policies and support were inadequate, as in much of Sub-Saharan Africa, few small farmers have adopted the improved technologies, and both overall growth and the incomes of the poor have suffered.

There is also evidence of a link between technology and wages. Detailed country studies often find that new technologies give an initial boost to the demand for agricultural labor because total labor use is greater over the course of the year. Rural wages increased in many states in India and Pakistan between the mid-1960s and the mid-1970s and in Java, Indonesia, between the mid-1970s and the early 1980s. The demand for farm labor may have slowed in India from the late 1970s owing to labor-saving innovations, sometimes encouraged by subsidies to mechanization. But slow growth in farm employment has been offset by the buoyancy of the nonfarm sector. There has been some concern that modern technologies and mechanization may have reduced employment opportunities and incomes for women, but the evidence does not, in general, support this view (Box 4.3).

**FARM-NONFARM LINKAGES.** Growth in the rural nonfarm economy is important in creating rural employment and in raising labor incomes. Small, labor-intensive enterprises are the most common. Nonfarm activities typically account for 20 to 30 percent of rural employment in Asia and Latin America and for 10 to 20 percent in Africa. If rural towns are included, the proportions rise substantially. A study in India found that employment in the nonfarm sector grew 35 percent in the 1970s, compared with 14 percent for employment in agriculture; without that growth, rural wages would have risen much more slowly. In Kenya among smallholder families per capita income from nonfarm sources climbed 14 percent a year between 1974–75 and 1981–82; incomes from farm employment rose only 3 percent a year.

Although the nonfarm sector has often expanded faster than the farm sector, agriculture is usually the key to the growth of nonfarm activities. An expanding farm economy demands inputs from and supplies raw materials to transport, processing, and marketing firms. Rising farm incomes lead to greater demand for consumer goods and services. A study found that spending on locally produced nonfoods accounted for 33 percent of the increase in household expenditures in rural areas of Malaysia and India and for 15 percent of increased spending in Sierra Leone and Nigeria. More generally, the study found that every dollar increase in agricultural income led to an income increase of about eighty cents elsewhere in the economy in the Asian cases and fifty cents in the African cases. This difference reflects the lower population densities and poorly integrated mar-

### Box 4.3 The impact of technological change on women

Modern seed varieties, irrigation, and the increased commercialization of crops have commonly been accompanied by the greater use of hired labor, mostly from landless households. The new technologies have also had important implications for the division of household labor. Wage labor has replaced unpaid labor, and in some cases male labor has replaced female labor. This has raised concerns that technological change has harmed women.

The substitution of hired labor for family labor usually improves the household's standard of living. In the Philippines, for example, the new technologies raised farming incomes, allowing households to hire labor and purchase labor-saving farm implements. This reduced the number of hours worked by family members in low-productivity jobs on the farm and allowed them to engage in other, more productive, activities such as trade or raising livestock. In addition, greater demand for hired labor provided jobs to landless workers.

Modern varieties have, in general, raised the demand for hired female labor. They usually require more labor per acre—particularly in tasks typically done by women, such as weeding, harvesting, and postharvest work. A study of three Indian states concluded that the use of hired female labor was greater on farms that had adopted modern varieties than on those that had not.

Other studies for India and Nepal have found that the overall use of hired female labor rose substantially with the introduction of modern varieties.

In some cases, however, mechanization has led to lower female employment. The outcome has often depended on the tasks mechanized. When predominantly female tasks were given over to machinery, women were displaced. This happened in Bangladesh, Indonesia, and the Philippines with the replacement of the finger knife as a harvesting tool and the introduction of direct seeding and portable mechanical threshers. In Bangladesh most of the postharvest work had been done by women using the *dheki* (a foot-operated mortar and pestle). When the dehussing and polishing of grain were mechanized, these operations were turned over to men, who now operate the modern mills. A study in the Indian states of Kerala, Tamil Nadu, and West Bengal found that where chemical fertilizers have replaced cow dung, men rather than women now apply the fertilizer because women lack access to the information provided by extension services.

When women were displaced, the effect on their incomes and on household welfare depended on whether they found more productive jobs elsewhere. Overall nonfarm employment did increase, but data classified by gender are scanty.

kets in Africa. Public investments in rural infrastructure (in electricity, transport, water, banks, telephones, schools, and so on) can greatly strengthen these linkages.

#### *The pattern of urban and industrial growth*

Growth in urban employment and wages is the second broad determinant of the pace of poverty reduction—through its direct influence on the existing urban poor and through the opportunities it creates for migration from rural areas (Box 4.4). Growth of urban employment is especially important in middle-income developing countries, but it matters increasingly everywhere. Governments can affect the urban demand for labor by altering the incentives and regulations that face workers and their employers and by providing, or failing to provide, adequate urban infrastructure.

**INCENTIVES AND REGULATION.** The demand for urban labor depends partly on government policy toward the markets for goods and capital as well as

on policy toward the labor market itself. Often, industrial protection reduces both the level and growth of labor use in the formal sector. As a rule, the greater the degree of protection, the greater the capital intensity of production; this is illustrated with data for India in Table 4.1. A more neutral trade regime would therefore increase the demand for labor. Some of this expansion in demand would probably come from increased exports, but the main reason for reducing protection is to use resources—including labor—more efficiently. Greater neutrality in the trade regime can support a more labor-intensive pattern of industrial expansion in import-competing as well as exporting sectors. A study of ten countries in the 1970s confirms this view. In addition, it found that in Indonesia, Pakistan, and Tunisia labor demand would have increased more from better use of resources within the import-competing sector than from a shift between the two sectors.

The contribution of manufacturing to employment over time differs greatly from country to country (Table 4.2). The growth of manufacturing

#### Box 4.4 Does rural-to-urban migration help or hurt the poor?

Most studies have found that people migrate mainly for economic reasons. Poverty, both absolute and relative, and income variability, which leads to greater vulnerability, cause people to move. In Botswana households "place" different members of the household in different labor markets so that, for example, the effects of a drought on rural incomes will be offset by remittances from members working in urban areas. In rural India households often marry their daughters into distant and dispersed (although still kinship-related) households. In almost all cases rural-urban migrants increase their incomes. Most migrants have jobs waiting for them or find one within a month or two. In the Ludhiana District of Punjab, India, 78 percent of migrants had a job after one month and 94 percent after two months. A study of the poorest of the urban poor, the Calcutta pavement dwellers, found that migrants were better off after moving. In Colombia rural-urban migrants had higher incomes than comparable people in their rural places of origin; the gains were even higher for the better educated.

The poorest are likely to be underrepresented in rural-urban migration. The study of Punjab's Ludhiana District showed that only 15 percent of rural outmigrants belonged to the lower classes, although they accounted for more than 24 percent of the sample. In a study of forty North Indian villages, only 5 percent of the working migrants came from farm-labor households, although such households made up 19 percent of the villages' population. The poorest may stay at home because they are less educated. In Kenya the

probability that an educated person will leave the village is five times greater than for an uneducated person; in Tanzania 90 percent of the men who left their villages had some schooling.

The poor who do not migrate may still benefit indirectly. Rural-urban migration has tightened the rural labor market in many countries. In addition, remittances help those who stay behind. In Kenya remittances helped to lift some of the poorest households out of the lowest income class and contributed to agricultural innovation, partly by reducing income variability. There is little evidence to suggest that migration worsens poverty in the sending areas.

The impact of migration on the urban poor is also of interest, but information is sparse. Migration, it might seem, will hold down urban wage rates for unskilled work in the informal sector. Evidence from Colombia showed that migrants had higher incomes than urban natives of similar education. But there is no evidence that migration causes the incomes of natives to fall.

Some countries have tried to reduce migration on the grounds that it leads to excessive and costly urbanization. With few exceptions, these efforts have failed to stem rural-urban migration significantly or to redirect migrants to secondary towns. An urban bias in policy could lead to more migration than is socially desirable. The appropriate policy is to focus on direct remedies—such as reducing the biases against agriculture in pricing and improving the social and economic infrastructure of rural areas.

**Table 4.1 Effective protection and labor intensity of manufacturing, India, 1986**

Degree of effective protection of industry	Share of fixed capital (percent)	Share of employment (percent)	Fixed capital per worker (thousands of rupees)
High	53	19	93
Medium	4	3	32
Low	43	78	18
All industries	100	100	32

Source: World Bank 1989b.

employment depends on both the growth and the labor intensity of the sector. The middle- and low-income countries of East Asia again stand out. Many of the countries that saw manufacturing employment rise quickly also had thriving farm sectors. Policies that avoid discriminating against agriculture go hand in hand with a more broadly labor-intensive pattern of development. No coun-

try opted for an entirely neutral trade regime, but incentives were far less distorted in Korea, Malaysia, and (after the mid-1970s) Thailand than in Argentina, Pakistan, or Tanzania.

**FACTOR MARKET INTERVENTIONS.** When governments intervene in the markets for capital and labor, they often exacerbate the antilabor bias of protection. Many countries make imports of capital goods cheap (through low tariffs and overvalued exchange rates), offer tax breaks for investment in capital equipment, and subsidize credit—all of which tend to reduce the price of capital. Subsidized energy prices often exacerbate this bias and, furthermore, have adverse environmental consequences. In contrast, social security taxes, labor regulations, and high wages (especially in industries in which competition among producers is weak) all tend to raise the cost of labor in the formal sector. A study of incentive structures in ten

**Table 4.2 The contribution of manufacturing to employment, selected countries, 1970 to 1980**  
(percent)

Country	Manufacturing employment as share of total labor force		Increment, 1970-80 <sup>a</sup>
	1970	1980	
Korea, Rep. of	7	14	36
Malaysia	9	16	33
Indonesia	6	9	23
Brazil	7	10	19
Thailand	5	7	13
Colombia	5	6	10
India	2	3	5
Zambia	3	3	4
Kenya	2	2	4
Tanzania	1	1	2
Pakistan	2	2	1
Argentina	17	13	-21

Note: The figures are based on registered employment in manufacturing.

a. The ratio of the increase in manufacturing employment to the increase in the labor force.

Source: United Nations Industrial Development Organization and World Bank data.

countries found that government intervention raised the relative price of labor in all cases in the early 1970s. The increase was 11 percent in Korea, between 30 and 50 percent in Argentina, Brazil, and Côte d'Ivoire, almost 90 percent in Tunisia, and more than 300 percent in Pakistan.

Labor-market policies—minimum wages, job security regulations, and social security—are usually intended to raise welfare or reduce exploitation. But they actually work to raise the cost of labor in the formal sector and reduce labor demand. Studies from the 1970s and 1980s found that job security regulations reduced the long-term demand for labor by an estimated 18 percent in India and 25 percent in Zimbabwe. There is little poverty, in any case, in the formal sector. Yet by trying to improve the welfare of workers there, governments reduced formal sector employment, increased the supply of labor to the rural and urban informal sectors, and thus depressed labor incomes where most of the poor are found.

**THE ROLE OF THE INFORMAL SECTOR.** In most developing countries the informal sector plays a prominent role in providing employment and incomes. It has been estimated to account for 75 percent of urban employment in many countries in Sub-Saharan Africa and for 85 percent in Pakistan. It also accounts for most of the poverty in urban areas. In Côte d'Ivoire, for example, the incidence of urban poverty in the informal sector is more than three times that in the formal sector.

The informal sector is very diverse in its income structure and activities. It is dominated by one-person firms and small-scale entrepreneurs that employ a few apprentices (often relatives) and hired laborers. Firms are not covered by government labor regulations, and there are no restrictions on entry. But many in the informal sector pay indirect taxes and fees—license fees for small repair shops and street vendors, for example. Wages are generally lower than in the formal sector, especially for apprentices. But there is also a high degree of inequality, and many entrepreneurs do much better than workers in the formal sector. Activities range from efficient manufacturing, transport, and trading enterprises to marginal work such as collecting and recycling trash. Most of the sector's production is for consumption—especially by low-income households—and little is exported.

As in the rural nonfarm sector, growth in the urban informal sector depends on the rest of the economy and, in particular, on the demand for nontraded goods and services. But preferential treatment for large firms has undermined the informal sector. Subsidized capital for one part of the economy implies fewer resources for the rest.

Some countries have tried to offset these biases. India, for example, has provided cheap credit for small enterprises and has restricted competition from larger firms. This kind of approach rarely works. Protection and constraints on the entry of large firms into labor-intensive activities have tended to reduce any gains in employment, especially since credit subsidies have led many small firms to adopt relatively capital-intensive techniques. Distortions in product markets, particularly biases in the structure of protection among industries, have probably been a more important influence on the demand for labor. Indeed, evidence suggests that small firms in the manufacturing sector are not necessarily more labor-intensive than large firms in the same line of business. In Korea labor intensity within industries seldom varies by a factor of more than three, whereas across industries it varies by a factor of more than a hundred.

Most countries have further undermined informal employment through heavy regulation. In Indonesia, where most of the informal sector is thriving, restrictions on pedicabs have steadily increased, and pedicabs are now completely banned from Jakarta. In Zimbabwe street vendors and small-scale enterprises are excluded from many parts of the towns, and small businesses have to struggle to acquire land titles. A study of

Peru found that a prospective entrepreneur who wanted to set up a small garment factory had to spend 289 working days dealing with regulations; in Lima it took more than two years to register a minibus route. In addition to removing biases that favor larger firms, light regulation together with the provision of appropriate urban infrastructure is the best way to facilitate growth in the informal sector.

**URBAN INFRASTRUCTURE AND POVERTY.** Urbanization will make increasing demands on infrastructure. Investments in infrastructure can make inroads on poverty both by improving living conditions and by promoting employment. Indeed the two go together. In many cases roads, water, sanitation, electric power, and other services for low-income areas help small businesses as well as households because many informal businesses are based in the home. Studies on Colombia and Korea show that access to public utilities is essential for small new firms. In Nigeria, as in many other African countries, weak urban infrastructure inhibits the growth of small firms that cannot afford, for example, their own power generators or water facilities.

#### **Increasing the participation of the poor in growth**

Growth that creates opportunities for the poor will have a greater impact on the poor if they have access to land, credit, and public infrastructure and services. Many countries have adopted programs to this end.

#### *Increasing access to land*

Policies to redistribute land have deservedly received much attention. In addition, policies that expand tenancy, provide clear land rights where traditional systems fail, and improve the management of common-property resources can create opportunities for many of the rural poor. Such policies should help reduce poverty and make the land more productive at the same time.

**REFORMING PROPERTY RIGHTS.** In the twentieth century virtually all the major redistributions of property rights in land were precipitated by social revolution, defeat in war, or national liberation from colonial rule. Many of these upheavals led to large-scale collective forms of organization, as was the case in China, Cuba, Ethiopia, the Democratic People's Republic of Korea, the U.S.S.R., and

Vietnam. The old agrarian order was swept away entirely and no compensation was paid. Elsewhere, reform helped existing tenants, smallholders, or new settlers by transferring individual rights; Egypt, India, Iran, Japan, Kenya, and the Republic of Korea are examples. In some cases compensation was paid, but it was usually based on depressed land prices.

In China, Japan, and the Republic of Korea, land reforms were extensive. They affected the poor in two ways. First, rural households benefited from the reallocation of rents and from new opportunities to use the family's resources. Second, together with favorable incentives for agriculture and strong local institutions, they provided the basis for broadly based poverty-reducing growth.

In the absence of a major upheaval, land reforms have rarely gone so far, and as a result their impact on the poor has been modest. In Egypt, India, and Iran the reforms made owners out of former tenants but favored the better-off farmers. Redistributions in Bolivia and Mexico attacked the inefficiency and inequity of the "hacienda" system, but since subsequent policies failed to sustain growth of productivity in smallholder agriculture, the effect on the poor was muted. In Bolivia, moreover, most of the land was given to large agricultural companies for livestock raising and forestry. And although more than half a million rural people gained access to four million hectares of land, many still lack land titles. This makes transactions difficult and limits the use of land as collateral.

In most circumstances, political realities forbid reform to stray far from the status quo. Where expropriation is not possible, the cost of compensating the former owners becomes a major difficulty, especially when policy distortions have driven up the price of land. Land reform can be expensive in other ways, too: there is the cost of mapping and registering the new owners' holdings and of providing infrastructure and services to raise productivity on the new farms.

The chances of successful land reform are greater if aid is available, as in the case of Kenya. A project in northeast Brazil also suggests that more modest land transfers to small farmers are feasible despite all the difficulties and that, when supported with adequate investment, they help to raise farm incomes (Box 4.5).

**IMPROVING TENANCY.** Many governments have tried to make tenancy more secure and thus, in effect, to transfer ownership rights. Some of these reforms have been successful—in the Philippines,

#### **Box 4.5 The merits of selective land reform: Northeast Brazil**

The Piaui Rural Development Project in Brazil—the first World Bank-supported project to focus on land tenure reform—shows that land transfers to small farmers are feasible and that security of tenure encourages poor farmers to adopt new technologies. It demonstrates what can be achieved in a country with a highly unequal distribution of land and agricultural policies strongly biased against the poor (as discussed in Box 4.1).

Land in Piaui was cheap—it was originally \$40 per hectare and fell to \$15 to \$25 per hectare as the project went forward. Over five years the project bought 200,000 hectares, distributed land to 3,480 families, and regularized land tenure for 1,500 families. It also provided physical infrastructure—mainly roads, water supply, and some irrigation. The income of 7,760 landholders increased by between 240 and 293 percent. Overall, the total cultivated area increased by 16 percent and the value of production by 50 percent. Yields increased by 10 to 40 percent for rainfed farms and by 30 to 70 percent for irrigated farms. Clear title had given the farmers an incentive to invest in the land and adopt better technologies.

for example, and in West Bengal and Kerala, India, where tenants' rights became inheritable. But tenancy reform has usually failed. Landlords have thwarted the new legislation by evicting tenants or concealing tenancy as wage labor. In Brazil, where tenancy laws limit owners' share of output and make it hard to evict tenants and sharecroppers, semiskilled workers have difficulty in gaining access to land. Landowners prefer informal and very short-term tenancy agreements. Or they may evict the tenants and use the land for forestry, livestock, or mechanized production or even leave it idle. In India and Pakistan the area cultivated by pure tenants has shrunk dramatically over the past thirty years.

Tenancy law is evidently not the best way to expand tenancy or to protect tenants' rights and incomes. Tenants' bargaining power can probably be strengthened most effectively through policies that raise the demand for labor and thus boost unskilled wages—the return to the best alternative for the potential tenant. Such policies are better suited for improving the chances for the landless to become tenants and enabling their households to increase the returns to their farming skills.

**BALANCING INDIVIDUAL AND COMMON PROPERTY.** Africa's traditional forms of land ownership seem to be evolving toward individual property rights. This is mainly because of population growth and the increasing commercialization of agriculture. But this shift toward individual land rights tends to undermine the ability of traditional systems to ensure that all members of the extended family have access to land. This feature of their land systems has helped some countries in Africa to avoid the extremes of poverty and landlessness that are common in much of Asia and Latin America: traditional systems have provided secure land tenure and encouraged farmers to invest in their land (Box 4.6). In such cases, encouraging individual land registration and titling may be undesirable. Where traditional systems have failed to provide clear land rights, land titles and registration are useful.

Common pasture and forest resources are important for poor rural households. They provide fuelwood, fodder, and employment to those who otherwise have few land rights. When the population is growing rapidly, or when there is open access to these land resources and traditional community management has broken down, the commons are often overused and degraded. This hurts those who depend most on the common resources as a safety net. Policies to privatize these resources have often failed to protect the interests of those with existing rights to the land or to create the basis for a viable and equitable system. Small farmers have sometimes been forced, as a result, to sell their individual holdings. Common-property resources should receive greater attention. They need to be better protected and better managed. Investment in research on how to use these fragile resources would be money well spent.

#### *Increasing access to credit*

Credit can help the poor to accumulate assets and to cushion their consumption in hard times. But extending credit to the poor is costly to the lender. Transaction costs are high, and the risk may be great owing to lack of collateral. Moreover, other borrowers, such as large-scale farmers, may have preferential access for cultural or ethnic reasons. Many governments have therefore tried to expand credit for the poor through large-scale subsidized credit programs and other measures. Several rationales have been given for these policies: the poor cannot afford market interest rates; formal lenders are too cautious; informal lenders are too

#### Box 4.6 Land tenure systems in Sub-Saharan Africa: the case of Rwanda

Some African land tenure systems retain from earlier forms of communal ownership features that give the poor guaranteed access to at least a small piece of land and at the same time motivate farmers to conserve the long-term productivity of their holdings. Rwanda offers a good example. It has one of the highest population densities in Africa (445 inhabitants per square kilometer of arable land in 1986), and employment opportunities outside farming are few (90 percent of the work force is in agriculture). Yet landlessness is almost nonexistent. For example, in Ruhengeri Prefecture, a densely farmed area, about 98 percent of rural households cultivate at least 0.1 hectares, and 75 percent work at least 0.3 hectares. The distribution of land is also relatively equitable. This contrasts sharply with similarly populated areas in Asia, where 30 percent or more of the rural households may be landless.

Survey data from a World Bank research study in three prefectures (Butare, Gitarama, and Ruhengeri) show that 22 percent of rural households did not inherit any land. About half the households in this group obtained some land from state allocations at or shortly

after independence. The rest obtained most of their land in the form of transfers (gifts and loans) from within their extended families. These transfers typically provide secure rights to the land and hence give farmers the incentive to use it efficiently and conserve its productivity. This is essential, given Rwanda's mountainous terrain and the potential for erosion.

The ability of the extended family to exercise some control over land transfers is a key feature of the Rwandan land tenure system. Households that borrow land rarely claim any permanent transfer rights over it, even though they may have the right to farm it on a long-term basis. Even land that is inherited or received as a permanent gift cannot always be freely transferred to others by the recipient. But the lack of full land transfer rights in this case does not appear to have affected farmers' investment behavior in improving and conserving land or the level of productivity that is achieved. What is crucial seems to be the right to bequeath land to family members. Without this right, levels of investment and use of modern inputs are significantly lower.

exploitative. But this approach turned out to be misguided.

**SUBSIDIZING CREDIT FOR THE POOR.** Despite, or because of, many years of trying to channel greater amounts of formal credit to the poor, only 5 percent of farms in Africa and 15 percent in Asia and Latin America have had access to it. In Bangladesh, after more than a decade of subsidies, only 15 percent of smallholders and 7 percent of the landless households had received institutional credit. Cheap credit has become a transfer program for the nonpoor. In Brazil these implicit transfers, at their peak in the early 1980s, were estimated to be as high as \$3 billion to \$4 billion a year (between 1.2 and 1.6 percent of GDP). In addition, artificially low interest rates and credit regulations distort the allocation of resources and lend themselves to patronage and corruption. They have damaged the financial sector and have failed to expand credit to the poor.

Studies of formal subsidized credit programs in Sub-Saharan Africa, the Middle East, and Latin America have found that loans in arrears range from 30 to 95 percent. Subsidized borrowers are less reliable than unsubsidized ones. A detailed study of three Indian villages found that about 60 percent of borrowers were in arrears in the two villages in which institutional credit accounted for

two-thirds of total credit; in the other village institutional credit was a smaller part of the total, and only 17 percent of borrowers were in arrears. And repayment rates were generally lower for large farmers than for small ones. So it is not poverty, as such, that makes borrowers unreliable.

Moreover, experience shows that the poor are willing to pay market interest rates. Bangladesh found that small farmers continued to demand loans even when the interest rate was about 30 percent a year. The poor, in any case, borrow routinely on the informal market, where rates are frequently very high. Moneylenders in rural Sri Lanka commonly charge rates of 25 to 50 percent for a growing season.

Where subsidized credit has reached the poor, other questions arise. By 1988, India's Integrated Rural Development Program (IRDP) covered 27 million rural families. A sample study in Uttar Pradesh found that almost 60 percent of investments had been retained for four to five years. But in 1986, 59 percent of IRDP loans were in arrears. The study in Uttar Pradesh showed, moreover, that only 7 percent of households that had repaid their loans were receiving additional credit. Thus, although the IRDP has succeeded in increasing the asset holdings of large numbers of disadvantaged households, it has not established sustainable financial services for the poor.

### Box 4.7 Learning from informal finance in Sub-Saharan Africa

Informal finance takes many different forms: saving and loan associations, rotating funds, mobile bankers and moneylenders, financial dealings among family and friends, and so on. Despite their flexibility, these arrangements are usually strict and well run.

Rotating associations, known in some African countries as *susus* or *tontines*, are flexible and creative. People pay an agreed sum into a fund, out of which loans are then made to members on a rotating basis. In Ghana *susus* have evolved into growing credit and saving facilities. Daily contributions range between 10 and 500 cedis (\$0.04–\$2.00). Collectors visit markets daily to accept deposits, no matter how small, mainly from market women. In rural areas collectors make their rounds early in the morning before farmers go to the field and again in the evening after they come back. Monthly deposits reach millions of cedis. A study in Tamale, in Ghana's Northern Region, found that monthly deposits by an average collector range from approximately 1.5 million cedis to 2.0 million cedis. A typical Northern rural bank might hold savings of 10 million cedis. The informal system evidently mobilizes a significant volume of savings.

Seeing the advantages of this approach, Ghana's

State Insurance Corporation began a *susu*-like program in February 1987. Money Back, as it is called, provides life insurance and investment services primarily to small- and medium-scale businesses. As with the *susu*, clients deposit an agreed contribution, and staff members visit markets daily to collect. Money Back works in a way that people find familiar, it provides clients with security for their savings, and it attracts funds that the formal banking system, on the whole, would not. The Money Back program is still in its early stages, but it is increasingly popular. It may grow into a regionwide or nationwide program.

In other African countries informal arrangements have grown into relatively large financial organizations. In Cameroon, Côte d'Ivoire, Guinea, Mali, and Senegal savings "clubs"—which include, for example, rotating funds and credit unions—have been established. These arrangements are based on personal loyalties, but they also function effectively as financial intermediaries that give mutual loan guarantees. The Cameroon Cooperative Credit Union League provides services to 231 credit unions with about 62,000 members and savings of about \$33 million.

Thus, cheap credit programs have not helped the poor. Public funds are better spent on infrastructure and services, such as agricultural extension and market information. A viable, undistorted financial sector will help to make the best use of this investment.

DEVELOPING FINANCIAL INSTITUTIONS FOR THE POOR. Subsidized formal finance has failed. But is there scope for expanding informal finance, the most common source of credit for the poor? Informal lenders, operating on low fixed costs, offer low-income clients small loans on the basis of personal or business acquaintance. Because informal lenders know a lot about their clients, they can be flexible about collateral and repayment schedules. There are lessons here for formal lenders (Box 4.7).

Despite its popularity and potential, informal finance has drawbacks. Its separation from larger financial markets limits the lenders' access to funds and reduces competition, and it rarely provides term finance or large loans. Some of these difficulties may be overcome through links between informal and formal finance, but much remains to be learned about these linkages.

The limitations of both formal and informal finance have led governments, donors, and NGOs

to adopt a variety of innovative credit programs targeted to the poor. These vary enormously in coverage (Table 4.3), but successful programs have certain features in common. Most have chosen not

**Table 4.3 Diversity in the coverage of credit programs**

Program	Year	Coverage <sup>a</sup>
MicroFund (Philippines)	1989	730
Production Credit for Rural Women (Nepal)	1989	6,640
Association for Development of Microenterprise (ADEMI) (Dominican Rep.)	1988	19,430
Small-scale Enterprise Program (Calcutta)	1988	36,000
Working Women's Forum (Madras)	1988	50,000 <sup>b</sup>
Small Farmer Development Program (Nepal)	1989	78,520
Saving Development Foundation (Zimbabwe)	1985	250,000 <sup>b</sup>
Grameen Bank (Bangladesh)	1988	413,000
Kupedes (Indonesia)	1988	1,300,000 <sup>c</sup>
Badan Kredit Kecamatan (BKK) (Indonesia)	1982	2,700,000

a. Cumulative membership.

b. Approximate figure.

c. Number of beneficiaries in 1988.

**Table 4.4 Grameen Bank loans, by purpose of loan and sex of borrower, 1985**  
(percentage of current loan amount)

<i>Purpose of loan</i>	<i>Male borrowers</i>	<i>Female borrowers</i>	<i>All borrowers</i>
Crop cultivation	4.0	4.6	4.3
Livestock, poultry raising, and fisheries	18.5	44.6	31.9
Processing and manufacturing	18.6	29.9	24.4
Trading and shopkeeping	49.7	18.7	33.8
Transport and other services	9.2	2.2	5.6

Source: Hossain 1988.

to subsidize interest rates. Instead, they have tried to adapt themselves to the needs of the poor by reducing transaction costs to both lender and borrower. Programs with high borrowing rates and strict terms, especially those that link repayment to future lending, stand a better chance of reaching the poor.

Group lending is one approach for reaching poor people. Typically, under such schemes one member's failure to repay jeopardizes the group's access to future credit. Joint liability among a group of borrowers reduces the risk of default and makes it cheaper to reach dispersed clients. The best-known example of this approach is the Grameen Bank in Bangladesh. It has successfully served extremely poor people—83 percent of them women—and its loan recovery rates exceed 95 percent. Table 4.4 shows how the poor use Grameen Bank credit. The Working Women's Forum in Madras, India, has also achieved recovery rates of between 90 and 95 percent. In both cases loan recovery far exceeds the national averages for commercial banks. Small, self-selected groups—such as those in the Grameen Bank or in Nepal's Small Farmer Development Program and Production Credit for Rural Women Program—usually offer the best base for such schemes.

The Zimbabwe Agricultural Finance Corporation demonstrates that group lending can decrease administrative costs. Because it lends only to established groups, its costs are a minuscule 1 percent of loan capital. If lenders must incur the costs of setting up the groups, however, the overall costs of group lending can exceed the costs of lending to individuals. At the Grameen Bank expenses as a share of outstanding loans are 16 to 25 percent for new branches, dropping to 6 percent after three years.

Group lending may not always be appropriate or necessary. Badan Kredit Kecamatan (BKK), an Indonesian public program, provides individual loans without collateral primarily to low-income women, without relying on groups. It contains its processing costs by making tiny initial loans (\$5 is the limit) on the basis of character references from local officials and by using one-page loan applications that are processed in less than a week. The program's local units are autonomous. To reach the poor, they disburse their loans quickly from accessible village outposts. Since the program's loans are small and loan terms have been strict, the nonpoor tend to look elsewhere for credit. Finally, the program encourages borrowers to repay by making repayment a condition for approving new loans, and it has strong incentives for loan officers to expand the client base and maintain high collection rates. The BKK has managed both to reach the poor and to remain financially viable. It serves more than 35 percent of Java's 8,500 villages, and in 1987 it earned profits of \$1.4 million—a 14 percent return on the loan portfolio.

Some credit programs have targeted microenterprises, often in urban areas, with packages of credit, training, and technical assistance. The programs that have emphasized credit have been the most successful. Schemes such as MicroFund in Manila, Philippines, and ADEMI in Santo Domingo, Dominican Republic, have targeted the poor—especially poor women, many of whom work in very small enterprises. Microenterprise lending can have a considerable impact on incomes. The average income of new borrowers from the Small-Scale Enterprise Credit Program in Calcutta rose by 82 percent, and that of borrowers from the Kupedes program in Indonesia increased from \$74 to \$183 after an average of three years. Most microenterprise credit programs receive subsidies to help cover their initial costs. Experience has shown that the more successful programs, such as Kupedes, can become financially viable if they charge market-based interest rates and keep operating costs low.

Experience also highlights the importance of savings. The Savings Development Foundation in Zimbabwe generated considerable savings by organizing households into neighborhood groups and devising a simple system of financial record-keeping that illiterate people could understand. By 1985, 250,000 members had saved enough to place bulk orders for fertilizer and seeds, improve their housing, and meet other basic needs. Rural women, who account for 97 percent of the pro-

gram's participants, acquired new skills while becoming financially more independent.

Although successes are none too common, they suggest that well-designed programs can give disadvantaged groups access to credit and still remain financially viable. Institutions of this kind should be supported with limited subsidies to help cover their initial administrative costs (but not interest rates) and to encourage innovation; with time, as costs decline, the subsidies should be withdrawn. Programs such as BKK, Kupedes, the Grameen Bank, and ADEMI have demonstrated the potential for raising the productivity and incomes of the poor. Because of their example, the number of similar schemes, although still small, has grown rapidly in recent years.

#### *Improving access to infrastructure and technology*

Public investment in technology and infrastructure is critical in raising incomes and reducing poverty. The extent to which the poor benefit, however, depends on the design and effective implementation of the programs.

ADAPTING TECHNOLOGIES FOR SMALL FARMERS. Technological improvements in agriculture have helped small farmers in some regions more than in others. The Green Revolution benefited many smallholders in Latin America and Asia, but in Sub-Saharan Africa relatively few small farmers use improved high-yielding varieties. In Malawi, after twenty years of agricultural research and extension, only 5 percent of farmers have adopted hybrid maize. This slow acceptance reflects severe biases against peasant agriculture. Many countries have encouraged and subsidized large-scale mechanized commercial farming, which is beyond the reach of most smallholders. In addition, supplies of inputs are unreliable, and storage facilities are lacking. More important, indigenous farm-research institutions are weak. As a result, there has been too little emphasis on developing and disseminating varieties and techniques that are appropriate for small-scale rainfed farms.

In addition to removing biases against small farmers, countries need an indigenous capacity to do adaptive agricultural research. International research centers initiate much of the scientific work necessary for technological change, but countries need to be able to identify relevant technologies and adapt them to the specific requirements of different farm locations. In Cameroon, for example, a public sector agency, the Société de Développe-

ment du Coton du Cameroon, adapted the existing research on cotton to the local environment and substantially improved the productivity of smallholders. Farmers should be more directly involved in the selection of research topics. Adaptive research needs to be broadened to include, for example, soil and livestock management techniques in addition to the traditional stress on crop husbandry. To make all this feasible, countries will also need well-trained extension workers to act as a bridge between small farmers and researchers.

PRODERO in Honduras has improved the productivity of small farmers by involving them in planning and testing new agricultural technologies. The project targeted farmers who owned less than five hectares in the isolated western states of Copan, Lempira, and Ocotepeque. To combat soil erosion, it developed low-cost methods of conservation and fertilization. Average maize yields increased by more than 300 percent.

Farming systems research is an approach that listens to farmers and pursues a broad research agenda. It looks at the entire farming system—cropping patterns, livestock and irrigation management, the division of labor among household members, and so on. The results in Zambia, Zimbabwe, and the Indian state of Bihar (Box 4.8) have been encouraging.

PROVIDING RURAL INFRASTRUCTURE. Poor farmers typically have less access to public infrastructure than more prosperous farmers. Rural roads and electricity, for example, are first extended to the relatively well-off. The supply of water to marginal farmers is especially erratic and inadequate. In India the low quality of canal construction and maintenance means that surface irrigation reaches only part of the intended area. Small farmers cannot afford deepwells, tubewells, or pumpsets.

Successful infrastructure projects have usually delegated to the local level as much responsibility for administration and maintenance as possible. This has required some effort in building local institutions, involving local people, and designing infrastructure with these needs in mind. *World Development Report 1988* showed that delegating public responsibility to local organizations can make infrastructure projects more effective and benefit the poor.

The National Irrigation Administration (NIA) in the Philippines has worked with user groups to improve maintenance and distribution. It employs community organizers to help form groups of water users and then negotiates with each group over

#### **Box 4.8 Developing appropriate technologies for subsistence farmers in Bihar**

The Rural Women's Agricultural Development Project, which is sponsored by the Birsa Agricultural University in Bihar, demonstrates how farming systems research can help to improve the incomes of the poor. The project targets poor tribal farmers in the drought-prone Chota Nagpur Plateau, where illiteracy rates reach 90 percent and 85 percent of the farmers possess less than five acres of land. Women perform at least half of the preharvest and four-fifths of the postharvest work. They depend mainly on rice-based rainfed farming for their livelihood. Inappropriate farming practices and insufficient use of inputs contribute to low productivity.

The local culture makes it difficult for male extension workers to advise female farmers or to be advised by them. Women with tribal backgrounds have therefore been hired as extension workers. They work through *mahila mandals* (women's groups).

Since farmers refused to adopt costly new technologies, researchers worked with them to develop a simple dugwell system that allows vegetables to be grown during the dry season, when land had previously been

left fallow. Farmers have also been taught to diversify to higher-value crops. Farmers, extension workers, and researchers analyzed the problems together. They then developed a package that combined new and indigenous technologies, tested the technologies both on-station and on-farm to adapt them to varying local conditions, and disseminated the package to participating villages.

The gains are illustrated by the experience of one farmer. In 1982 she had planted 2.5 acres of rice and millet in the rainy season, 0.5 acres of cauliflower in the winter, and no crops in the summer. In 1987 she planted her 2.5 acres with rice and potatoes during the rainy season and with wheat, cauliflower, peas, and carrots in winter. In the summer she planted 1.25 acres of cabbage and okra.

Diversification and irrigation raised cropping intensities and incomes. Cropping intensity rose, on average, from 95 percent in 1981-82 to 145 percent in 1986-87. Gross income per household increased more than four times in real terms.

the quantity of water delivered. User groups allocate water and costs among themselves and share construction and maintenance responsibilities. Between 1981 and 1984 this allowed a 38 percent drop in the NIA's per hectare spending on operation and maintenance. The efficiency of water use and distribution improved, and the access of small farmers to irrigation increased. The NIA, which had started as a pilot project in 1976, covered more than 35,000 hectares by 1986. The Gal Oya irrigation project in Sri Lanka was modeled on the Philippine program. There too the introduction of user groups almost doubled the efficiency of water use, and the improved irrigation system now reaches the poorer farmers downstream.

Both schemes were based on pilot projects, and both embody a flexible design. The designers experimented extensively with the composition and responsibilities of user groups and with ways to integrate these groups with the national administration. Their success has led such countries as Malaysia and Thailand to introduce similar systems.

Local organizations are more likely to succeed if they are legally recognized by the central government and if the government provides support in the form of guidelines, training, and information systems. It is also crucial to establish management

systems that define clear lines of responsibility for agency managers and performance criteria that are linked to budget allocations and create incentives for greater local responsibility. In the case of the NIA, farmer groups were required to repay construction costs, which increased their ownership of the program and the accountability of managers. In turn, each regional office was expected to achieve financial viability, and managers' performance was evaluated by their actual recovery of costs from farmers.

Another illustration of the importance of local institutions is the Aga Khan Rural Support Program in northern Pakistan. This NGO-managed project supports commercialization in subsistence villages. It has created village organizations, built productive physical infrastructure, developed financial services, and provided support systems and training for production and marketing. The local organizations carry out many tasks and have avoided the need for coordination with ministries. The program has recorded household participation rates of up to 97 percent in Gilgit District and has achieved average rates of return of 33 percent for irrigation schemes and other projects.

More targeted approaches are especially important in remote regions where poor people are iso-

lated from markets and services. In order to reach the most disadvantaged—tribal groups, the landless or near landless, and, in some societies, women—it is essential to work with organizations such as local groups, NGOs, and private operators, that know their needs. The International Fund for Agricultural Development (IFAD) has carried out many projects that target the poorest. IFAD uses pilot programs and flexible designs and usually relies on forming groups to reach the target population. A rural development project in Cameroon, designed to improve coffee production by farmers who own less than two hectares, is one example. A similar approach has been used by NGOs in Bangladesh, where landless groups operate irrigation equipment and sell water to farmers (Box 4.9).

The lessons of recent experience in rural infrastructure and technology programs are broadly as follows. Local institutions can mobilize resources such as savings and labor. They can help to ensure that project benefits reach the poor, that specific local needs are met, and that the projects remain financially viable. Successful programs have not relied exclusively on government agencies, which can provide effective central support but often lack both the field staff and the flexibility to work at the local level. Instead, they have employed a mixture of institutions—NGOs, private operators, and lo-

cal groups. Large programs that start as pilot projects seem to have a better chance of success. A pilot project may slow the scheme down and use up valuable management time, but the benefits usually outweigh these costs.

### Reaching resource-poor areas

Increasing numbers of poor people live in areas that have little agroclimatic potential and are environmentally fragile. Examples include the Loess Plateau in China, the highlands of Bolivia and Nepal, the desertic African Sahel, and much of the humid tropics. Population pressure in these areas has decreased the productivity of the land and increased its vulnerability to flooding and soil erosion. This raises the question of the links between poverty and environmental degradation.

These regions need a special development strategy, for three reasons. First, their potential for growth is limited. Second, they are increasingly occupied by poor people with the fewest skills and the least access to infrastructure and supplies. Third, environmental degradation in these regions adversely affects both the immediate area and regions downstream or downhill.

The causes of these growing pressures on natural resources are complex and interconnected. In many countries poor farmers are being margina-

#### Box 4.9 Groundwater irrigation in South Asia: reaching the landless

In the Gangetic Plain groundwater is one of the few remaining natural resources that can be exploited to reduce rural poverty. Recent efforts to help the landless poor benefit directly from groundwater irrigation have been based on groups. Proshika and the Grameen Bank have organized new groups and have called on existing ones to buy and operate irrigation equipment and sell water to farmers.

Five points stand out in the groups' performance to date. (1) In certain technical respects (for example, the area irrigated with equipment of a given capacity), the groups are at least as effective as private management. (2) Some groups have successfully promoted the use of high-yielding varieties by their customers. (3) The groups invest some of their higher incomes in other activities, such as fisheries, poultry raising, or cottage industries. (4) They help farmers to spread the risks associated with irrigation and to reduce the costs of organizing farmer cooperatives, settling conflicts, and so on, which can be high for minor irrigation. (5) The

repayment rates achieved by Proshika (75 percent) and the Grameen Bank (more than 75 percent) are much higher than is usual for agricultural loans.

The biggest drawback is the demands this approach makes on management. Most groups require costly managerial and technical assistance, and they often need help in mediation with water users. Problems such as technical deficiencies in pump operation and maintenance, difficulties in obtaining satisfactory pump locations, and struggles over contracts with water users have led the Grameen Bank to assume direct management of some groups.

After more than a decade Proshika has reached only about 300 groups covering 6,000 irrigated acres. It is unlikely that such groups can become a significant force in groundwater management. But the groups have managed to reach the poorest of the poor, who are usually excluded from rural development initiatives. The reasons for their success are just beginning to be understood and merit further study.

#### **Box 4.10 Protecting the environment and reducing poverty: China's experience in the Loess Plateau**

In China's Loess Plateau, programs combining erosion control with improved crop- and animal-raising practices have reduced chronic soil erosion and increased rural incomes. This success follows several earlier failures. It suggests that economic and sustainable agriculture in such areas requires a mixture of technical, social, and policy actions. It also confirms the importance of research in pilot stations prior to broad implementation.

The Loess Plateau extends over about 630,000 square kilometers of northwestern China. Rainfall is barely sufficient for agriculture and is often concentrated in sporadic, heavy falls in the summer. Agricultural expansion and exploitation have progressively removed the plateau's vegetative cover, contributing to erosion and degradation of the soil on most of the plateau. Streams carry silt to the Yellow River, creating problems for downstream irrigation works and causing dangerous increases in the height of the riverbed.

The situation worsened during the 1960s and 1970s. As part of the national policy of self-sufficiency in grain, farmers on the plateau were encouraged to switch from pasture-based livestock and limited grain production to extensive grain cultivation. This exacerbated land degradation and led to declines in agricultural productivity and income. By the mid-1980s more than five million people on the plateau's rainfed uplands were surviving on incomes of less than \$50 a year.

In the late 1970s the government initiated research and development to improve erosion control and agricultural production in the area. Erosion control experiment stations were established in Mizhi County (Shaanxi Province) and Dingxi Prefecture (Gansu Province). The strategy is designed to reverse environmental degradation by replacing the existing extensive cropping system with intensive cropping on terraces

and reclaimed flatland and by converting unterraced hills to fodder and tree-crop production. Specific measures include constructing new terraces to reduce erosion and increase crop yields, introducing improved pasture species, eliminating uncontrolled grazing on unterraced hillsides, planting trees and shrubs on the steepest hillsides, and constructing soil dams to create cultivable flatlands by impounding loess sediment. These measures require that much of the steeply sloped land that is now being cultivated be taken out of crop production. Higher yields on existing and newly created flatland and terraces are therefore essential for raising production and farm incomes.

The initial results have been favorable. The per capita gross value of output has doubled, output has been diversified, and soil erosion has been reduced. Despite a decrease in the area sown to grain, greater yields on improved terraces and intensively cultivated flatland have helped to increase total per capita grain production by more than 30 percent. Expanded pastureland supports more sheep, and the volume of animal products has increased. Cost-benefit analysis indicates that the financial and economic rates of return range from 13 percent for construction of soil dams to 25 percent for the terracing of gently sloped land for crop production.

The government is now encouraging adoption of the erosion control program throughout the Loess Plateau by limiting cultivation on steep, unterraced land and by providing credits for constructing terraces and planting pasture species. Participating households receive full rights to land use and rights to the output of trees and fodder from hillsides they have converted. The agricultural development component of the Gansu project, which is assisted by the World Bank, is supporting implementation of the strategy over about 200,000 hectares in the Guanchuan Basin in Dingxi.

lized and pushed to frontier areas. In addition, population growth and the commercialization of agriculture have forced farmers who once relied on environmentally sustainable forms of cultivation to use their land more intensively. That might be desirable under certain systems of land and livestock management, but the intensification of traditional farming methods, such as slash-and-burn agriculture, has damaged the productivity of these marginal areas. Overgrazing, unmanaged irrigation, and an ever widening search for fuelwood all accelerate the decline.

Policies that discriminate against smallholders in granting access to land and forests make matters

still worse. For example, land policies have directed population movement away from the most productive land by giving a few large estates preferential access (as in Malawi) or by limiting migration (as in Tanzania). Insecure land tenure and encroachment on common and state lands encourage soil-mining practices that diminish the longer-term productivity of the land. Policies that promote industrial extraction from these areas (such as pulp subsidies to Indian rayon mills) can add to the pressures on the resource base.

Providing infrastructure to develop these resource-poor regions may be neither cost-effective nor viable. A better strategy would start

with investment in education and training to spur outmigration to areas of better potential. Spending to meet basic needs such as health care and drinking water will also be required. Outmigration would be most effective in countries where labor demand is growing strongly in other regions.

Experience, however, shows that migration is only a partial solution. Growth in the areas of greater potential is usually not high enough; many resource-poor regions have rising populations despite outmigration. Therefore, additional investments will be necessary. These will involve training poor farmers in better techniques for farming, animal husbandry, and soil and moisture conservation, increasing the opportunities for diversification and off-farm employment, and providing local user groups (such as the village forestry associations in Korea and the rangeland management associations in Botswana) with rights to manage degraded communal lands. In addition, policies to make land tenure more secure in areas in which traditional tenure systems have broken down will discourage farmers from mining the soil for short-term gains.

In many of these areas farmers can adopt low-cost, low-input technologies that would increase and stabilize yields, diversify production, and maintain the resource base. One such technology, contour cultivation, has raised yields substantially—by between 6 and 66 percent on slopes of up to 32 percent. When contour cultivation is supported by a vegetative barrier—vetiver grass, for example—the benefits are even greater. Vetiver grass has been used for many years in the Caribbean, Kenya, and South Asia. It holds soil while allowing for water filtration, and it is cheap to establish, manage, and maintain. But it is not appropriate everywhere; it is ineffective in parts of the Sahel where soil and moisture are insufficient.

In some regions more substantial interventions will be required. Programs that target only a few households or villages cannot prevent soil erosion or protect watersheds. Box 4.10 describes how improved technology for terraced lands and more appropriate land tenure policies have decreased land degradation and poverty in China's Loess Plateau.

Reaching the poor in these regions will be difficult. Without effective measures, the situation is likely to grow worse for the foreseeable future. In-

ternational research institutes have recognized the urgency of the problem and have increased their funding for research in marginal areas. The International Rice Research Institute in the Philippines, for example, now devotes 12 percent of its budget to upland rice cultivation alone. In many countries government subsidies to develop and improve low-return farming activities may be the only way to reduce poverty in these regions.

### **Policies for poverty-reducing growth**

Achieving a pattern of development that successfully reduces poverty requires policies that provide opportunities to the poor and enable them to participate in growth. To accomplish this, policies must be attuned to three broad tasks.

First and foremost, economywide and sectoral policies must encourage rural development and urban employment. Experience indicates that this requires moderate taxation of agriculture and relatively undistorted product and factor markets. It also requires public provision of infrastructure and an environment that makes technical change accessible to small farmers and the urban poor.

Second, specific policies are needed to improve the participation of the poor in growth by increasing their access to land, credit, and public infrastructure and services. Land transfers can reduce poverty, but they succeed only in special circumstances. Other policies to increase and secure access to land can also reduce poverty. Subsidized credit programs have failed to reach the poor, but approaches such as group lending offer a promising alternative. Flexible programs that involve the intended beneficiaries, build institutions, employ NGOs and local groups, and respond to local needs are the best way of molding infrastructure, services, and technology to the needs of the poor.

Third, resource-poor regions, where poverty and environmental degradation are interrelated, require a different approach. Since the potential for growth in these regions is limited and the population is increasing, policies that facilitate outmigration are essential. But in many of these regions additional investments, which are likely to require government subsidies, will still be necessary to meet basic needs, maintain or increase yields, and preserve natural resources.