

# V STRATEGIES AND INSTRUMENTS FOR IMPROVING RURAL QUALITY OF LIFE

This chapter investigates promising policy strategies and specific program initiatives to improve QOL in rural Asia.

Policymakers need to keep three general strategic considerations in mind.

- The requirement for a coordinated and balanced policy portfolio: one-dimensional policy approaches are unlikely to improve QOL sustainably. Policymakers should seek to initiate virtuous spirals of QOL development, using policy to ensure that successes in one area feed quickly into others.
- The importance of implementation: only rarely does the policy design process adequately anticipate the harsh and unforgiving realities of the field. Many policy proposals appear well targeted, but ultimately prove to be horrendously wasteful, with program benefits scattered widely among those least in need. Capacity building, as well as partnership with NGOs, existing local networks, and the private sector, are essential for effective implementation.
- The need for policy to be conceptually sound: policy design must be based on a clear understanding of underlying mechanisms, such as institutional strength or weakness, gender, or connections of rural areas to urban and global economies. Unintended consequences are a feature of many well-intentioned policies. Environments also vary greatly over time and from place to place. So while good practice from one country

is a useful guide for policymakers, it should not be assumed that applying the policy to another development setting will necessarily have the same consequences.

There are an enormous number of policies and programs that could promote rural QOL. Strengthening mechanisms of good governance, creating rational policies of urban development from which rural migrants could benefit, expanding and improving agricultural extension programs, and providing scholarships and incentives for girls' schooling are just a few of many. Six specific areas are examined in depth: income generation, infrastructure, energy, social service provision, microfinance, and land reform.

## **INCOME GENERATION**

Income is the single most important correlate of QOL. It is strongly associated with direct improvements to QOL, but also enables positive feedback from QOL components such as education, gender equality, nutrition, and health. Much is known about the factors that enable income and economic growth. Liberal policies regarding trade and capital mobility, good governance, properly valued exchange rates, absence of fiscal deficits, proper supervision of the banking system, public investment in infrastructure, and adoption of appropriate policies to overcome market failures are all growth-enhancing public policies and functions. So, too, are investments in health, education, and family planning.

### **The Income–QOL Relationship**

Table V.1 shows parameter estimates from least-squares regressions based on the analytical framework described earlier. These regressions relate per capita GDP to several QOL

indicators using cross-country data, and incorporate rural–urban disparities by including the rural share of the country’s population. It is clear from these results that income is inseparably linked to QOL. There is a statistically significant relationship between levels of income and indicators of health, education, nutrition, poverty, fertility, and governance, with effects that are bidirectional.

The links between income and other facets of QOL such as education and health depend on both their consumption and investment aspects. Income offers direct and immediate benefits; education and health care offer benefits in the future. Accordingly, the higher the returns to human capital, the more of their increased money people are likely to spend. Dynamic labor markets, credit opportunities, and an entrepreneurial culture will all contribute to the development of human capital, as will gender equality, which increases opportunity for half the population.

Policies that are intended to improve rural incomes must pay particular attention to the primarily agricultural nature of rural economies. Raising agricultural productivity is a key factor in income growth, rural poverty alleviation, and human development in Asia. The development of new technologies is critical, as evidenced by the green revolution, and these efforts should be nurtured by governments and donor agencies. Measures are also necessary to encourage the adoption and efficient use of new technologies. The dissemination of information and the availability of credit are important, as is the development of insurance markets to protect against the higher risk associated with many new technologies.

Rural areas are heavily dependent on urban economies, both to absorb excess labor and for remittances. A rapidly developing industrial sector will raise rural incomes through increased remittances and by decreasing the rural labor force, thereby placing upward pressure on rural wages. Effective macroeconomic policies are central to developing the industrial and manufacturing sectors, and failure of such policies, as for example in the case of the regional financial and economic crisis, can have a high cost for rural inhabitants.

**Table V.1: The Effect of Income on Quality of Life Indicators.  
OLS Regression Coefficients Based on a Cross-country Sample**

Indicator	Constant	Log GDP per Capita (PPP)	Rural Share	NonAsia Dummy	R <sup>2</sup>	N
<b>INCOME</b>						
Population Below \$1/day (%)	88.484*	-12.208**	0.435**	12.507*	0.50	54
Population Below \$2/day (%)	128.537	-14.129**	0.562**	5.161	0.56	54
<b>EDUCATION</b>						
Primary Enrollment 1994 (% gross)	29.295	8.766**	0.009	-10.617**	0.22	121
Secondary Enrollment 1993 (% gross)	-45.880	16.739**	-0.507**	-11.498*	0.63	119
Literacy Rate (% people, 15+)	11.662	9.987**	-0.238**	-6.307*	0.46	167
<b>HEALTH</b>						
Life Expectancy at Birth	13.889**	6.828**	-0.071**	-2.216*	0.72	165
Infant Mortality Rate (per 1,000 live births)	225.275**	-23.692**	0.269**	3.777	0.65	167
Maternal Mortality Rate 1980-1988 (per 100,000 live births)	1432.069**	-161.043**	2.917*	39.732	0.53	100
<b>NUTRITION</b>						
Calories Available per Capita 1987- 1989 (% need)	20.811	11.655**	-0.083	-1.665	0.54	102
Wasting 1980-1989 (% children age 12-23 months)	-0.435	0.187	0.107**	-1.228	0.29	61
Stunting 1980-1989 (% children age 24-59 months)	117.729**	-9.977**	0.070	-14.499**	0.57	62
<b>FERTILITY</b>						
Total Fertility Rate Contraceptive Prevalence Rate	9.216**	-0.853**	0.018**	0.636**	0.53	167
	-77.454**	16.240**	-0.069	-10.104**	0.60	122

(continued next page)

Table V.1 (Cont.)

Indicator	Constant	Log GDP per Capita (PPP)	Rural Share	NonAsia Dummy	R <sup>2</sup>	N
<b>INFRASTRUCTURE</b>						
Percent of Cropland						
Irrigated	65.841*	-1.661	0.312*	-19.372**	0.09	139
Percent of Roads						
Paved	-28.244	11.687**	-0.311**	-7.048	0.33	150
Telephones (per 1,000 people)	-1037.137**	140.705**	-0.149	34.811	0.69	166
<b>POLITICAL</b>						
Economic Freedom						
Index	7.713**	-0.549**	-0.003	0.067	0.57	96
Political Rights	17.555**	-1.371**	-0.027**	-1.507	0.28	166
Civil Liberties	17.702**	-1.362**	-0.026**	-1.562**	0.39	166

\* Significant at 10% level \*\* Significant at 5% level. N is the number of observations.

Source: See Appendix 1. Data are for 1995 unless otherwise stated. GDP = gross domestic product; OLS = ordinary least-squares; PPP = purchasing power parity

While raising rural incomes through broad-based economic policies is perhaps the most effective way to improve QOL for the largest numbers of people, this may not sufficiently improve the lot of the worst-off members of rural societies. Over and above efforts to raise general incomes, it may be necessary to develop policies targeted specifically at the poor. The next section discusses strategies for poverty alleviation, a central goal of any attempt to improve QOL of those who need it most.

## Poverty Alleviation

The single most important force contributing to the alleviation of rural poverty is economic growth. Analyses of data for 68 countries worldwide from the 1960s to the 1990s reveal that income growth per capita is an exceedingly powerful predictor of poverty reduction. Across countries, percentage increases in income per capita translate into equal percentage increases in income per capita of the lowest quintile

of the income distribution (Gallup et al., 1998). Even more striking is the finding that this same result holds true when estimating the average within-country effect of overall income increases on income received by the lowest quintile. Each 1 percent of growth in GDP per capita translates into 1.1 percent growth in income per capita among the poorest quintile. The results persist when the analysis is modified to evaluate the effect of income growth on the rural poor. Regression analysis that controls for the share of a country's population that is rural shows that a 1 percent increase in national per capita GDP leads to a 1.7 percent increase in the incomes of the poorest quintile.

While economic growth is the most effective way to reduce poverty, the benefits do not reach everybody, and having safety nets in place for those still trapped in indigence is important. Governments have attempted various poverty alleviation schemes to provide relief to those most in need. These include such programs as employment guarantee schemes, whereby the poor are employed in infrastructure development projects, or nutrition subsidy programs, whereby the government subsidizes the cost of food and fuel for the poor.

One of the main problems such schemes face is the difficulty of targeting the poor effectively. All poverty alleviation programs suffer from some amount of leakage, that is, some benefits flow to people who are not poor, which can make such programs expensive to run. Poverty alleviation programs must either be self-targeting, or require some form of external targeting whereby the government identifies who will qualify for benefits based on income or similar criteria. The latter approach is likely to have far greater leakage, because information on incomes is costly for the government to acquire, enforcement is difficult, and incentives for corruption and cooption are high. Designing programs in which the incentive structures favor self-selection is more efficient.

Employment guarantee schemes have generally been an effective approach to poverty alleviation. They provide rural infrastructure as well as income to the poor. If wages are slightly lower than other options, then the program is effectively self-

targeting. Food-for-work programs are a variant of employment guarantee schemes, and while they have also proved to be an effective method of self-targeting, the added administrative costs for managing the food supplies generally make them an inefficient option.

Free meals for primary school children are expensive, but highly effective. While governments often subsidize education, particularly primary education, the costs of sending children to school can represent a significant burden to poor families because of such factors as transportation and opportunity costs. The provision of a free meal can offset some of the costs for poor parents, thereby increasing their incentives to educate their children. Adequate nutrition is also essential to educational attainment. Quite simply, hungry children do not fulfil their potential in school. Those evaluating the costs of these programs for governments must take long-term poverty reduction benefits into account (World Bank, 1998c).

Poverty is closely linked to landlessness, caste, ethnicity, and gender, and poor people are often trapped by low rates of literacy, high indebtedness, low social status, and limited political control. Poverty reduction requires empowerment of the poor, as well as measures to increase income.

Empowerment is not a neutral process and is likely to face significant resistance. A catalyst is often needed to break this resistance, such as the knowledge brought by education, or the introduction of an external group such as an NGO. For example, the microcredit loans the Grameen Bank has provided to rural women in Bangladesh have not only enabled them to increase their incomes, but have also given them a greater voice. They are now less willing to be exploited by money-lenders, landlords, or even their own family members, and are further enabled to take control of resources. These are benefits that simple wealth transfers could not achieve. The Self-Employed Women's Association, started in Gujarat, India, provides another example. It acts as a trade union for women working in the informal sector, helping uneducated women who face severe exploitation from entrepreneurs. By organizing themselves into a union, the women have succeeded in putting

an end to this exploitation, not only raising their incomes, but also creating a sense of control over their lives and livelihoods.

The NGO community has long been at the forefront of developing creative approaches to enhance the empowerment process. Through education programs, advocacy, consciousness raising, and community organization they have provided numerous examples of how civil society can work to bring together the poor and dispossessed to fight for their rights and to break free of the cycle of poverty. However, while NGOs are often the major catalyst in the empowerment process, their work tends to be carried out on a small scale and is not always easily replicable. National governments, by contrast, can affect outcomes on a much larger scale. While the nature of government bureaucracy does not naturally lend itself to the process of empowering people, governments should create a supportive environment for such a process. By understanding the need to increase the voice of the poor, national governments can work together with civil society to improve the effectiveness of poverty alleviation in rural Asia.

## **INFRASTRUCTURE**

The importance of infrastructure was discussed in Chapter III, where qualitative data showed that many rural inhabitants view the provision of infrastructure as a central factor in improving their lives.

Infrastructure can be classified into two categories: economic and social. Economic infrastructure includes long-term structures that are used either by households or in economic production, and the services that such structures provide. Examples include public utilities such as electricity and telecommunications systems, public works such as roads, and essential elements of other transport sectors including railways and airports. Social infrastructure is composed of institutions such as schools, universities, and health-care facilities (World Bank, 1994).

This section focuses on rural economic infrastructure; the next looks at energy, which is related to infrastructure. Subsequent sections explore the provision of social infrastructure and services.

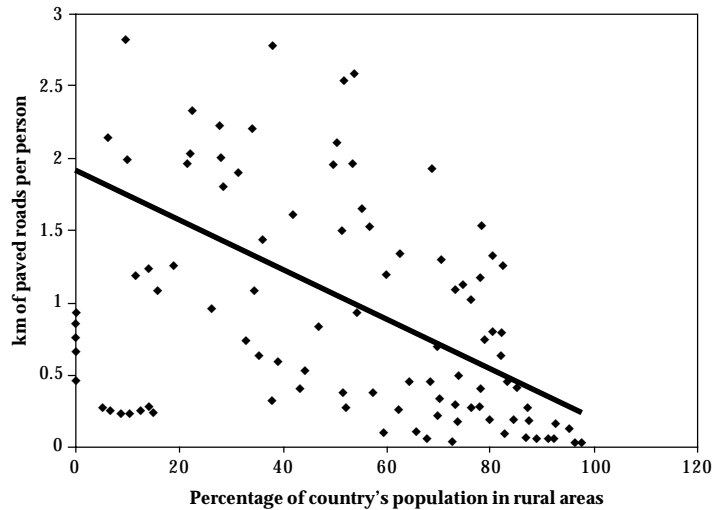
### **Urban versus Rural Infrastructure**

An assessment of current infrastructure stocks and a comparison of urban and rural coverage can provide a good understanding of the effect of infrastructure on QOL in rural areas. As described in Chapter III, different countries define rural areas differently, and comprehensive infrastructure data for rural areas are available only for water supply (World Bank, 1998d). In general, reliance here is placed on national infrastructure stocks, which serve as reasonable proxies for rural infrastructure when coupled with data on the rural share of the population.

The difference in the water supply between urban and rural areas is illustrative of the disparity in infrastructure development. In 1998, the average water supply availability in urban areas for 12 Asian countries reached almost 72 percent, whereas in rural areas it reached only 54 percent. Were more data available, other elements of infrastructure would reflect even greater disparities in access, even when quantities are comparable. For example, a few urban roads service great numbers of people; rural roads provide access to fewer people due to the lower population density.

The urban-rural disparity is further reflected by Figure V.1, which shows the relationship between rural population share and paved roads per 1,000 people for a cross-section of Asian countries and time periods. Countries with a greater rural population have fewer kilometers of paved roads, implying a paucity of coverage for rural populations.

Even after controlling for the expected growth of infrastructure over time, the same pattern of less infrastructure corresponding to higher rural share is consistent across a large sample of Asian countries for several kinds of infrastructure



**Figure V.1: Relationship between infrastructure and rural share of population**

(Table V.2). Table V.2 includes six measures: length of roads, length of paved roads, length of rail lines, number of telephones, number of telephone main lines, and electrical generating capacity. For every measure of infrastructure except railroad lines, a higher percentage of the population in the rural sector indicates a lower stock of infrastructure. The apparent opposite effect from length of railroad lines is statistically insignificant and only shows up when the measure of railroad lines is normalized by population. Almost all of the negative relationships are statistically significant at the 99-percent level, with the exceptions of length of roads (normalized by population) and length of railroad lines (normalized by land area). Despite the few exceptions, the overwhelming pattern is that a higher rural population implies less infrastructure.

The strongest negative correlations between rural population share and infrastructure were for telephones and telephone main lines. The stock of each decreases between 5 and 7 percent for every additional 1 percent of the population living in rural areas. Such a strong negative correlation is logical

**Table V.2: The Effect of Rural Share on Infrastructure in Asia, Controlling for Time and Normalized by Land Area**

Measure	Roads	Paved Roads	Rail Line Length	Telephones	Telephone Main Lines	Electrical Generating Capacity
Dependent Variables	Coefficient (t-statistic)					
Rural Share	-0.025***	-0.052***	-0.008*	-0.071***	-0.066***	-0.054***
Dummy 1965	-0.767***	-0.967***	-0.060	-1.641***	-1.816***	-1.941***
Dummy 1970	-0.580***	-0.806***	0.003	-1.290***	-1.383***	-1.610***
Dummy 1975	-0.481***	-0.429**	0.021	-0.945***	-0.961***	-1.170***
Dummy 1980	-0.279**	-0.277*	-0.010	-0.463***	-0.577***	-0.693***
Dummy 1985	-0.102	-0.181	0.044	-0.173*	-0.249***	-0.248**
Constant	1.887***	2.559***	-2.240***	6.959***	6.486***	1.192***
R <sup>2</sup>	0.34	0.48	0.01	0.64	0.64	0.59
N	128	124	109	154	158	168

**Normalized by Population**

Measure	Roads	Paved Roads	Rail Line Length	Telephones	Telephone Main Lines	Electrical Generating Capacity
Dependent Variables	Coefficient (t-statistic)					
Rural Share	-0.009	-0.031***	0.001	-0.061***	-0.055***	-0.029***
Dummy 1965	-0.315**	-0.625***	0.460***	-0.896***	-1.389***	-1.590***
Dummy 1970	-0.225*	-0.555***	0.415***	-0.636***	-1.076***	-1.321***
Dummy 1975	-0.223*	-0.266	0.326***	-0.421**	-0.770***	-0.978***
Dummy 1980	-0.106	-0.183	0.196***	-0.134	-0.505***	-0.598***
Dummy 1985	0.011	-0.121	0.153***	0.027	-0.292***	-0.234**
Constant	0.935***	1.496***	-2.704***	6.361***	6.106***	0.101
R <sup>2</sup>	0.12	0.32	0.04	0.82	0.88	0.76
N	133	125	118	161	187	198

\* Significant at 10% level \*\* Significant at 5% level \*\*\* Significant at 1% level

because establishing telephones and telephone lines in rural areas is costly due to the long distances to be covered, although mobile telephones are changing this dynamic to a certain extent.

Lengths of rail lines and roads (paved and unpaved) have the weakest negative correlations with the rural share of the population. This is partly explained by the fact that roads and railways are a necessary prerequisite for the construction of telephone and power lines. (Likewise, dirt or gravel roads usually precede paved roads.) Thus, many rural areas that still have no telephone or power access do have road or railway access. Despite the lesser magnitude of the correlations, they are still highly significant.

Asia's stock of infrastructure falls in the middle of that in the developing world in general. Asia has, on average, more infrastructure than sub-Saharan Africa and less than Latin America and the Caribbean (Table V.3). (The low number for Asia's telephones per 1,000 people is probably due to the smaller sample than was used in Table V.4.)

However, using regressions to control for the share of rural population (Table V.2), it becomes evident that a disproportionate amount of Asia's infrastructure is focused in its cities. The rural populations are even worse-off than those in sub-Saharan Africa. The lower level of infrastructure in rural Asia versus rural Africa is statistically significant for railways, telephones, telephone main lines, and energy-generating capacity, with the last showing the greatest difference. An additional 1 percent of rural population in Asia implies greater than 4 percent less energy-generating capacity than the same additional population implies in sub-Saharan Africa.

### **Infrastructure Changes Over Time**

As would be expected, infrastructure in Asia has improved over time. Table V.4 shows average infrastructure per 1,000 people in 1965 and 1990 for a cross-section of Asian countries. The most dramatic increases have been in telephone infrastructure. However, most telephone improvements have

**Table V.3: Average Stocks of Infrastructure per 1,000 Population.  
World Subregions, 1990**

	Asia	OECD	Sub-Saharan Africa	Latin America & the Caribbean	World
Kilometers of Rail Lines	0.06	0.59	0.13	0.27	0.20
Total Kilometers of Roads	0.84	7.78	0.54	0.92	2.13
Kilowatts of Energy-generating Capacity	0.19	1.60	0.11	0.36	0.47
Number of Telephone Main Lines	32.89	390.98	11.36	59.96	92.19
Number of Telephones	19.04	298.81	20.04	97.08	47.83

OECD = Organisation for Economic Co-operation and Development

**Table V.4: Average Infrastructure per 1,000 Population.  
Asian Countries, 1965–1985**

	Asia 1965	Asia 1985	Annual Growth Rate (%) 1965-1985
Kilometers of Rail Lines	0.09	0.07	-1.26
Total Kilometers of Roads	0.47	1.17	4.56
Kilowatts of Energy-generating Capacity	0.07	0.15	3.81
Number of Telephone Main Lines	9.89	25.82	4.80
Number of Telephones	8.17	37.36	7.60

occurred in urban areas, implied by the strong negative correlation between telephone infrastructure and rural population.

Road and railway growth has taken place to a greater extent in rural areas, as shown by the less negative correlations between the rural population share and these infrastructure measures (Table V.5). It is worth noting that the negative growth in railway infrastructure reflects that railways are growing more slowly than the population, not that they are decreasing in an absolute sense.

**Table V.5: Correlations Between Rural Share of Population and Selected Measures of Infrastructure per 1,000 Population**

	Rural Share
Kilometers of Rail Lines	-0.23
Kilometers of Paved Roads	-0.46
Total Kilometers of Roads	-0.25
Kilowatts of Energy-generating Capacity	-0.63
Number of Telephone Main Lines	-0.68
Number of Telephones	-0.66

Growth rates in infrastructure in more recent years are much lower than growth rates from 1965 to 1990. This points to an alarming slowdown in infrastructure growth that will affect the future QOL in rural Asia. The relatively low levels of some kinds of infrastructure development in rural Asia still permit large gains to be made from future development.

### **Policies for Infrastructure Development and Investment**

Despite the potential gains that infrastructure represents for development and improved QOL, infrastructure investments often fail to realize expected benefits. Maintenance is a key problem. According to the World Road Association and the UK Department for International Development (1999), for example, sub-Saharan Africa has lost one third of its US\$150 billion investment in roads due to inadequate maintenance. An analysis of 85 countries shows that spending US\$12 billion on maintenance would have saved US\$40 billion in reconstruction costs.

This chapter focuses on a number of policy trends and options that attempt to address the problems. First, more attention is being given to augmenting community provision, as well as stakeholder involvement. Second, there is an increasing focus on how to involve the private sector in providing and financing infrastructure. Third, the continued

role of central governments may be important in supplying infrastructure.

Communities have become increasingly involved in the establishment of infrastructure, sometimes playing an administrative and financial as well as a labor role. The Republic of Korea's *Saemaul Undong* program has helped villagers build more than 50,000 kilometers of roads in the past 30 years. The village of Purang, Nepal, established its own power plant, which was planned, owned, operated, and maintained by the community, in this case even without external funding. Communities in the Banglung district of Nepal constructed 62 suspension bridges with local materials and labor, supported by only US\$50,000 from the government (World Bank, 1994).

One way in which governments can promote more efficiently the development of infrastructure is by opening opportunities to the private sector. Sometimes this is even a necessity, because the investment needs involved in infrastructure may exceed what many developing-country governments can provide (Malhotra, 1997). Participation of the private sector has risen enormously in the past decade, with foreign investments in financing infrastructure projects for developing nations growing from only US\$100 million in 1998 to US\$20.3 billion in 1996 (Thobani, 1999). It is expected that private-sector investment will account for about 15 percent of infrastructure spending in developing countries by the year 2000 (Anayiotos, 1994). Power is the most important sector to attract private finance, followed by telecommunications and transportation (Dailami and Klein, 1997).

In addition to private finance, infrastructure has been a major focus of development assistance and loans. For example, 31 percent of the World Bank's loans in 1996 and 25 percent of aid from the Organisation for Economic Co-operation and Development went to finance infrastructure projects (ODI, 1998). In some regions these figures have been higher, as in Africa where 40 percent of World Bank loans in the past 30 years have gone to transportation, communications, water, and power (Farah, 1998).

Despite the rapid increase of private investment in infrastructure, the overall rise has been lower than the increase of private capital flows to developing regions in general. According to Dailami and Klein (1997), this is the result of political pressure to keep prices of infrastructure goods such as electricity or water below the cost of producing them, and because the typical time horizon of infrastructure investments is long, 10 to 30 years. During this time investors are exposed to huge risks, including currency fluctuations and the ability of governments to sustain the original conditions of contracts (Dailami and Klein, 1997).

High risks and sparse population mean that many rural sectors will never have a sufficiently dense population to attract such investment. An immediate way the residents of sparsely populated rural areas can gain the benefits of a growing infrastructure is through government assistance. Assistance does not mean, however, that no cost recovery is possible. Often there is far greater willingness to pay for infrastructure services in rural areas than is assumed. Armed with the appropriate projections, governments may be even more willing to undertake the task of providing infrastructure. Here again, partnerships with NGOs and user groups can be mutually beneficial. When beneficiaries have a greater voice in the design and implementation of infrastructure projects, their ultimate satisfaction, willingness to pay, and willingness to maintain it will increase. Such collaboration creates a win-win situation for rural consumers and the government. Consumers are more satisfied, and the government has more sustainable programs at a lower cost.

Because of the relatively low level of infrastructure in much of the Asian rural sector, developing roads, telephones, and electricity will allow great gains to be captured through higher economic activity, better health, and higher levels of education. Governments will see returns on their investments in the QOL of their rural citizens and in the activity of the national economy.

## **ENERGY<sup>15</sup>**

Energy use has an enormous impact on rural populations and their QOL. Patterns of energy use in rural areas have important observable effects on QOL. Indoor pollution is a critical problem, while the difficulty of obtaining fuel has negative consequences in terms of both time loss and the environment. Generally, the lack of modern energy sources also detracts from rural areas' ability to develop economically. This section focuses on rural Asia's reliance on fuel wood and other forms of biomass, which has created an energy-poverty trap for many rural Asians. Policies to help people escape from this poverty trap are then discussed.

### **Patterns of Energy Use in Rural Areas**

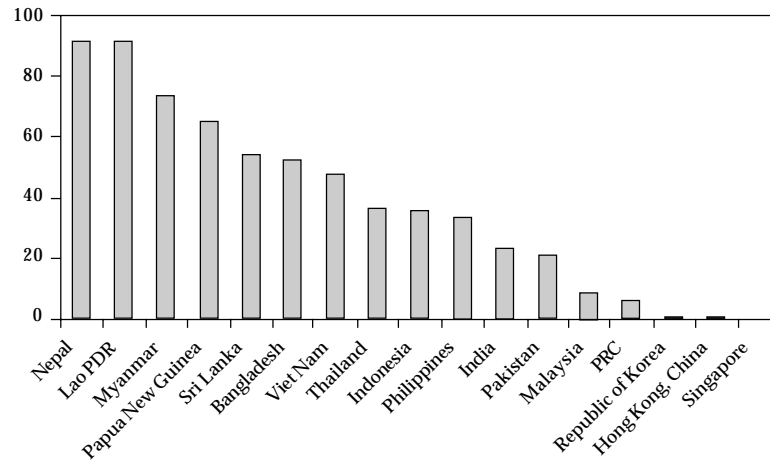
Reliance on biomass is greater among countries with lower incomes, with more unequal income distributions, with relatively large rural populations, and with more forest cover per person. Figure V.2 shows the proportion of traditional fuel use in specific Asian countries, and Figure V.3 shows the ratio of traditional to total fuel use versus the rural share of the population. In Asia, the average share of traditional fuel in total energy consumption is 56 percent in countries with a 1993 GNP per capita less than US\$2,000, but only 2 percent in countries with a GNP per capita above US\$7,000.

Various forms of energy can be conceived on an energy ladder, with each rung corresponding to the dominant fuel used by successive income groups (Hosier and Dowd, 1987; Reddy and Reddy, 1994). Wood, dung, and other biomass represent the lowest rung on the energy ladder, with charcoal

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<sup>15</sup> Parts of this section draw on David Bloom, John Gallup, and David Beede, "Energy and Poverty" unpublished manuscript, 1997.

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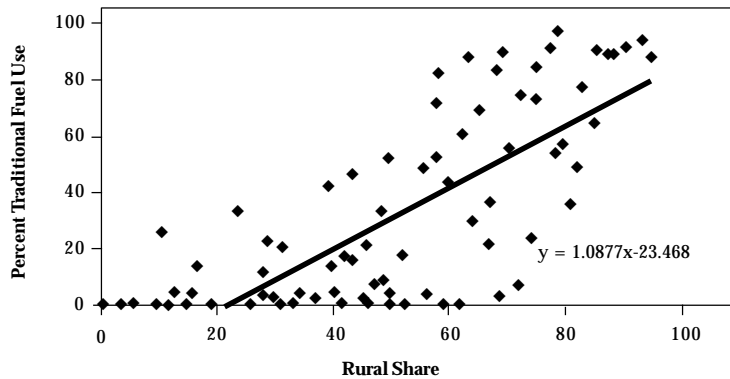
Source: United Nations Energy Statistics Yearbook 1993

**Fig.V.2: Percent Traditional Fuel Use, by Country**

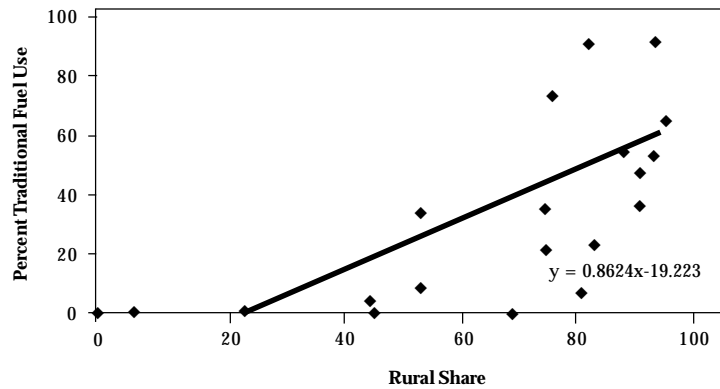
and coal, kerosene, LPG (propane), and electricity representing successively higher rungs. Income appears to be the main characteristic that influences a household's choice of energy carrier (Leach, 1992; Reddy and Reddy, 1994). Relevant attributes of the energy carriers include accessibility, convenience, controllability, cleanliness, efficiency, current cost, and the expected distribution of future costs. Both poor countries and the poor within countries are disproportionately positioned on the lowest rung, where fuels are less efficient and less clean.

Because different fuels require different appliances—stoves, lamps, etc.—each with its own range of costs and rates of depreciation, fuel costs have both fixed and variable components. The importance of this distinction is magnified by the presence of quasi-fixed costs, such as fixed monthly charges for a natural gas or electricity hookup; by the need to make large, 'lumpy' purchases of some fuels, such as LPG; and by the need to make sometimes sizable security deposits to guarantee either the payment of monthly bills or the return of equipment such as LPG canisters. Despite the fact that they are refundable, security deposits impose a cost on households,

(a)



(b)



Sources: Traditional fuel use data from United Nations *Energy Statistics Yearbook 1993*. Rural Share data from World Bank (1998d)

**Figure V.3: Ratio of Traditional to Total Fuel Use vs. Rural Share of (a) Global Sample and (b) Asian Countries**

the magnitude of which depends upon the return on those funds in their next best use (that is, their opportunity cost).

In rural areas in particular, economies of scale hamper the distribution of energy. It is often not economically viable to connect regions of low population density to a national electric grid, particularly when, as in the case of most rural areas, the per capita use of electricity would be low and likely to remain so for some time. Similarly, suppliers must charge

more to deliver LPG canisters to rural areas, both because of the relatively low density of customers and because delivery routes are long.

The proportions of fixed, quasi-fixed, and variable costs affect household decisions about fuel choice, depending upon the rate at which a household discounts future benefits, which may be determined in part by the household's level of wealth and its liquidity. For example, households that apply high discount rates to fuel consumption decisions, because of the high cost either of diverting resources from other uses or of borrowing funds to cover up-front capital costs, will tend to prefer fuel carriers that involve lower up-front and periodic costs. (See Reddy and Reddy, 1994, for evidence that the poor behave as if they have higher discount rates than the rich when making energy-carrier decisions.) Fuel costs may be determined either in a market or implicitly in terms of the opportunity cost of time spent gathering the fuel (for instance, firewood).

Table V.6 shows the different energy-use patterns of rural and urban residences in Pakistan and Viet Nam. The data were collected in the early 1990s as part of the World Bank's Living Standards Measurement Survey (LSMS), which include information on a range of measures of household structure, activities, and well-being. As the surveys analyzed here included detailed questions on the sources and uses of energy, as well as a variety of poverty indicators, they are ideally suited to addressing many of the central issues in this study. The Viet Nam sample includes 4,800 households, while the Pakistan sample includes 4,798 households. Table V.6 shows that people in rural areas are far more likely to use biomass for most energy end-uses than are urban dwellers, and that they are more likely to use kerosene than electricity for lighting, while the reverse is true in the cities. The energy ladder is clearer in urban areas than in rural, primarily because such a large proportion of rural energy use centers on biomass.

According to the same data, rural households in Pakistan devote 9 percent of their total expenditures to fuel, compared to 13 percent in urban households. This difference reflects the fact that rural residents, who tend to be poorer than urban

**Table V.6: Energy Use by Household Activity and Rural/Urban Residence, Pakistan and Viet Nam**

Fuel and Uses	Pakistan		Viet Nam	
	% Rural Households Using	% Urban Households Using	% Rural Households Using	% Urban Households Using
<b>Cooking</b>				
Electricity	1	2	0	3
Gas (LPG)	5	46	0	0
Kerosene	9	26	0	10
Charcoal and Coal	1	1	3	29
Biomass, incl. Wood	94	48	55 41	51 (wood) 71 (other biomass)
<b>Space Heating</b>				
Electricity	2	2		
Gas (Natural and LPG)	1	7		
Kerosene	1	1		
Biomass Fuels	30	11		
<b>Water Heating</b>				
Electricity	0	1		
Gas (Natural and LPG)	2	31		
Kerosene	2	8		
Biomass Fuels	34	17		
<b>Lighting</b>				
Electricity	59	93	39	88
Kerosene	85	40	59	12

Notes: Biomass for Pakistan data is wood, dung, wheat straw, coconut shell, cotton sticks, rice straw, rice hull, corn husk, bagasse, tobacco husk, and other biomass.

Sources: 1991 Pakistan LSMS. Biomass for Viet Nam data is wood, leaves, rubbish, sawdust, straw or thatch. 1992–1993 Viet Nam LSMS. Figures can sum to more than 100% because an individual household may use more than one type of energy source for a given application.

dwellers, use energy primarily for cooking, whereas urban residents use it for cooking and to some extent for water heating, space heating, and lighting. The cost estimate for rural households is, however, understated because people in rural areas devote a larger portion of their most important asset, their time, to the production of energy services. For example, these same rural households devote nearly 200 more hours per year to the collection of biomass than do urban households.

In a study of cooking fuel costs in Pakistan, Bloom, Gallup, and Beede (1997) found that, although electricity is

more expensive than LPG, kerosene or wood in terms of cost per unit of energy, it is potentially the least costly when the efficiency of the relevant stoves is accounted for. In effect, these authors argue, rural people who tend to use wood actually pay more for usable energy than urbanites. As energy is a significant household expenditure, energy expenditure detracts significantly from households' ability to satisfy their basic needs for food, shelter, clothing, health, and education. Thus, shifts to the use of less-expensive energy sources hold considerable potential to improve QOL in all of its key dimensions.

### **Is There an Energy–Demography–Poverty Trap?**

The use of biomass as a source of energy is detrimental to the health of household members and diminishes their ability to work productively, with women, girls, very young children, and those in cold climates suffering most, as they spend most time indoors. Most studies show a positive correlation between indoor pollution generated by the use of traditional fuels and the incidence of respiratory illness or congestive heart failure (see Smith, 1987, for a thorough review; see also Mumford et al., 1987; Chen et al., 1990; van Horen et al., 1993; Sims, 1994 for recent studies) although a few (Ellegard and Egneus, 1993) have failed to find a connection.

It is hypothesized that use of traditional fuels is directly linked to demographic and health outcomes. Burning biomass in a poorly ventilated area may significantly harm many individuals' health, reducing life expectancy in a group of people. Unhealthy people, in turn, typically have less capacity to work sufficiently to earn income. Because they earn less than they would if they were healthy, they continue to have very restricted access to health services and education, and die disproportionately young. So, too, do their children, who are especially vulnerable to indoor pollution. Dependence on children for labor (including gathering of wood and dung, formation of dung paddies, etc.) and for old-age security leads people to continue to bear children at high rates. Aversion to

the risk of infant and child death means that fertility behavior more than compensates for expected mortality, resulting in higher rates of population growth. When women have more children, both the women and the children tend to have worse health, more of the children die, and the status of women continues to stagnate.

To study these possible links, the association between the use of traditional fuels and a set of demographic and health indicators was examined using cross-country data. The sample consisted of all 108 countries in the world for which the requisite data were available (Table V.7). In order to control for nonenergy differences that potentially could confound the estimates, income is included in the analysis. This is done in a very flexible way, allowing the effect of income on demographics to be highly nonlinear, so as to impose a minimal degree of structure on the data and, therefore, on the results.

A strong association was found between a broad array of demographic indicators and the ratio of traditional fuel use to total fuel use. In particular, the effects of traditional fuel use on infant and child mortality rates are positive, statistically significant, and sizable. Moreover, the magnitude of the effects is comparable for infants and children. Strikingly, although traditional fuel use has a positive effect on the crude death rate, it is not statistically significant and is smaller in magnitude than the effects on infant and child mortality. This result is consistent with the view that deleterious consequences of indoor air pollution are disproportionately experienced by children, who are physiologically most vulnerable to its effects. It is also striking that the statistically significant negative effect of traditional fuel use on life expectancy is larger for females than for males, providing evidence of QOL-reducing gender inequality in households that rely on use of biomass in traditional ways.

The results in Table V.7 also reveal that fertility—both the total fertility rate and the crude birth rate—is positively and significantly associated with traditional fuel use. In addition, the magnitudes of these fertility effects are quite sizable. A 40 percent increase in traditional fuel use (which corresponds, for example, to the difference in traditional fuel

**Table V.7: Relationship between Demography and Traditional Fuel Use.  
OLS Regression Coefficients Based on a Cross-country Sample**

	Constant	Percent Traditional Fuel Use	Log GNP per Capita	Inverse Log GNP per Capita	R <sup>2</sup>
Crude Death Rate	-227.919**	0.007	13.247**	1044.726**	0.54
Infant Mortality Rate	-795.305**	0.247**	37.945**	4203.384**	0.83
Under-5 Mortality Rate	-1377.804**	0.494**	67.613**	7066.313**	0.82
Life Expectancy	213.215**	-0.088**	-5.453*	-816.024**	0.86
Male Life Expectancy	195.649**	-0.076**	-4.708	746.366**	0.84
Female Life Expectancy	231.647**	-0.102**	-6.234*	-889.108**	0.86
Life Expectancy Gap (F-M)	35.998	-0.026**	-1.526	-142.741	0.35
Crude Birth Rate	66.412	0.176**	-5.336	-6.581	0.77
Total Fertility Rate	-0.011	0.025**	-0.213	37.326	0.78
Population Growth Rate	3.031	0.021**	-0.184	-3.546	0.43

Note: \*\* indicates significance at the 5% level, \* indicates significance at the 10 % level. The number of countries is 108 in all regressions. Data from 1993 and surrounding years. Traditional Fuel includes fuelwood, bagasse, charcoal, animal wastes, vegetable wastes, and other wastes. Traditional Fuel Use is expressed as a percentage of total fuel use.

OLS = ordinary least-squares

Sources: Traditional Fuel Use data from Energy Statistics Yearbook 1993. New York: United Nations. Demographic data from World Bank (1998d)

use between Viet Nam and Malaysia) translates, on average, into one extra birth per woman over her lifetime and into an increase of seven births per 1,000 population. The fact that the crude birth rate effect is higher than the crude death rate effect explains why traditional fuel use has a positive and significant effect on the population growth rate. For example, the same 40 percent increase in traditional fuel use translates into an increase of nearly a full percentage point in the population growth rate.

The evidence presented here suggests that the rural poor are locked in a poverty trap: their patterns of energy use are associated with high infant and child mortality and with high birth rates maintained in part by high demand for children's labor. These demographic and production circumstances, in a context of low education levels, reinforce existing patterns of energy use. Continued dependence on wood for fuel helps to depress income and maintain rural poverty by (a) requiring that time and money resources are devoted to collecting firewood; (b) harming the health of those who use it; and (c) abetting high birth rates. These conclusions are strongly buttressed by recent research on the economic consequences of demographic change (ADB, 1997a; Bloom and Sachs, 1998; Bloom and Williamson, 1998; Bloom, Canning, and Malaney, 2000). In the many areas where deforestation is taking place for agricultural purposes, the burdens of gathering firewood and all its derivative effects are increasing, as ever-greater amounts of time are needed to reach areas where firewood can be gathered.

### **Improving Rural QOL by Addressing Energy Problems**

The links between energy and poverty have implications for the development of strategies to improve the quality of rural life and alleviate poverty. Standard poverty-alleviation strategies, such as macroeconomic growth, human capital investment, and redistribution, do not address the energy-poverty nexus in developing countries. Rural areas, in particular, are relatively unaffected by such strategies. If patterns of energy use in rural areas depress nutrition, health, and productivity, then residents

of rural areas are likely to benefit only very slowly from overall economic growth. Schooling will continue to promote earning capacity and QOL, but less effectively when biomass is the dominant energy carrier because of poor lighting, lack of access to knowledge via radio and television, and poor school attendance due to respiratory illnesses and time spent gathering wood.

Taking measures to promote the availability of modern energy sources and decentralizing control of these resources can help to promote social and economic equity within countries and thereby improve QOL in rural areas. Likewise, making markets work better by making credit more easily available (to help overcome barriers imposed by high up-front costs) is an important step. These measures will promote the use of more efficient energy sources, a necessary condition for helping the rural poor emerge from the energy-poverty trap. If such measures succeed, the emergence of rural areas from this trap will pay for itself.

### **Tackling the Biomass–Poverty Trap**

Policies and programs that focus directly on creating opportunities for the poor in rural areas to increase their use of energy carriers other than biomass will allow them to enjoy both short-term and self-reinforcing long-term improvements in their standard of living (Reddy, 1991). Changing the financing structures associated with energy costs is also important, such as by

- pricing public utilities in a way that allows households to spread over time the fixed costs of connecting to electricity and natural gas grids;
- offering microcredit to buy appliances;
- allowing people in rural areas to rent appliances needed to utilize energy carriers; and
- providing smaller LPG canisters that require smaller deposits.

The access of poor households to modern fuels can also be improved by the geographic expansion of energy infrastructure to underserved rural areas. However, because of past failures to realize expected benefits, grid extension is a controversial and very expensive measure. On a more modest scale, governments may choose to arrange cross-subsidies to lower the cost of electricity in areas that are already electrified.

There is also scope for making dependence on biomass less costly. First, improved stove designs make a significant difference in the efficient burning of biomass. A new generation of stoves has gained widespread acceptance in some developing countries. The Chinese National Improved Stove Program is particularly noteworthy: in the 10 years beginning in 1982, more than half of all households in rural PRC received biomass stoves (mainly for burning wood and crop residues). Extensive pilot testing of new designs, promotion of stove manufacturing in rural areas, and economic incentives for stove use were all important factors in the PRC's success. This success, however, comes with a major cautionary note: even households with new stoves still tend to use coal extensively, in part because coal stoves require less tending (Smith et al., 1993).

Second, biomass resources that are not privately controlled are likely to be used more effectively and efficiently if they are managed by local, rather than national, governments (Anderson, 1996). Local users are more likely to understand the burdens imposed on themselves and on the environment by the use of biomass resources, and to have the incentive to manage such resources efficiently and sustainably. Laws that allow such control to remain in or be transferred to local hands may make biomass resources less expensive in the long run.

### **Developing New Sources of Energy in Rural Areas**

New developments in energy technology hold out the possibility of significant improvements in the availability of energy supplies in rural areas. The current set of available

energy carriers often consists primarily of low-efficiency, unhealthy, relatively expensive biomass sources. Electricity, as noted above, is the cheapest source for cooking, but this is only true when the electricity grid is already in place. Rural-based sources of electric power could make an enormous difference in the availability of inexpensive energy for rural areas.

The possibility of burning biomass to create electricity at competitive prices has long been discounted for two reasons: the need to draw biomass from large land areas, and the technical difficulties of efficient biomass conversion. Recent work (Reddy et al., 1997; Williams, 1998), however, points out that technological breakthroughs now permit the conversion of biomass to electricity that can be produced and sold at competitive rates. The type of microturbine envisioned for use in rural areas is extremely easy to maintain, is suitable for small-scale installations, and is expected to be very durable. The type of biomass gasifier that is needed to work in tandem with such a microturbine is already commercially available in India. In Nicaragua, sugar refineries burn bagasse (a surplus sugar cane product) to make heat and electricity for their own use, and in at least one instance, profit by selling excess energy through the grid.

In rural areas throughout the developing world, numerous projects have demonstrated the feasibility of using manure and crop residues to generate biogas for use in cooking and power (Reddy et al., 1997). Similar efforts have been made to collect methane gas emitted by the organic residues in solid waste, although these attempts have often foundered because of technical difficulties. Keys to operating successful biogas plants include ensuring local technical capacity in operating and maintaining systems, and motivating end-users to collect biomass for use by the plant.

Other types of power generation may be feasible in rural areas. Advances in wind generation, small-scale hydropower, geothermal generation, photovoltaics, and solar thermal-electric technology make rural areas increasingly appropriate sites for generating significant quantities of electricity. These renewable energy sources are relatively nonpolluting and have

the additional advantage that the fuel is free. As the technologies improve, these methods become more and more competitive.

Such developments could easily meet the current demand for electricity in rural areas. Indeed, it is likely that rural areas could sell energy to urban areas. Although extending power lines to provide electricity to relatively isolated rural areas is often not economically viable, the reverse is not necessarily true. If rural areas are generating electricity at competitive prices, it may well be feasible to extend the grid to rural areas for the purpose of selling electricity to urban areas. In this case, research (Williams, 1996) indicates that, in some circumstances, biomass used to produce electricity might generate more income per hectare than would cash food crops. Finally, as noted earlier, the availability of adequate electricity in rural areas may spur industrial investment and the creation of jobs.

## **PROVISION OF SOCIAL SERVICES**

The availability of social infrastructure, in particular education and health, is crucial to the fulfillment of basic human capabilities. This section explores the advances made in rural Asia, but notes that rural areas lag behind urban ones. It suggests a number of policies for ensuring that rural Asians benefit from gradually increasing levels of social services.

### **Social Progress**

In the 1960s and 1970s, most Asian governments set up widespread systems to deliver health and education services. While some countries involved the private sector, provision and financing were for the most part public, with a strong emphasis on universal coverage. User fees were therefore kept low, with services financed through general tax revenues. The

extensive networks of schools and health-care facilities that were created had a dramatic impact on social outcomes. Life expectancy increased from 48 years in 1960 to 66 in 1995, and infant mortality halved during the same period, from 131 per 1,000 live births, to 56. Literacy and school enrollment rates have also been rising. In East and Southeast Asia, primary school attendance is now practically universal. In South Asia, primary school enrollment rates rose from 68 percent in 1965 to 94 percent in 1992, and adult illiteracy had declined to 50 percent by 1995.

While the improvements in recent decades have been substantial, critical problems remain. For example, regional disparities are wide. While many countries in East and Southeast Asia have been able to provide access to high-quality social services to most of their populations, South Asia still lags behind. Adult literacy rates are below 30 percent in Nepal, and primary school enrollment rates are less than 75 percent in Pakistan. In Afghanistan, still suffering from the upheavals of civil war, primary school enrollment rates are barely 30 percent and the infant mortality rate is a staggering 157 per 1,000 live births. Gender disparities are also significant in South Asia. Adult female literacy in countries such as Nepal and Afghanistan lies below 15 percent, and female primary school enrollment rates are significantly below male enrollment rates in Pakistan and Afghanistan. Furthermore, a deeply entrenched urban bias in Asia has meant that rural areas are significantly disadvantaged in terms of access to both health and education services. For reasons of political economy, it is generally in governments' interests to concentrate resources on densely populated urban areas to the detriment of the rural population. Even without this urban bias, access to schools and medical facilities is more difficult and costly in rural areas, with their poorer roads and transportation infrastructure.

Asia, on average, has seen large increases in real per capita outlays on social service spending over the past decade. Between 1980 and 1995, public expenditure on education rose from 2.1 percent to 2.6 percent of GDP in East Asia, and in South Asia from 2 to 3 percent. Health expenditure is lower,

at 1.7 percent of GDP for East Asia and 1.2 percent for South Asia, but has also been growing in absolute terms (World Bank, 1998b). On average, both health and education spending throughout Asia increased between 1986 and 1996 at an annual rate of almost 6 percent in real per capita terms (Gupta et al., 1998).

The public systems for social service provision in many Asian countries have not only been inefficient in terms of resource use, they have also tended to provide low-quality service, especially in rural areas. The inefficiency of these systems and the budgetary burdens that they place on governments, especially in the face of rapidly increasing demand for services brought about by population growth, have led to a call for new and innovative ways to meet the need for health and education services, including a growing willingness to involve the private sector.

### **The Role of Government**

Traditionally, governments have played a predominant role in providing social services for reasons of both equity and efficiency. In rural areas, especially those where the population is dispersed and infrastructure is limited, the costs of providing widespread access can be significant. Rural populations are also, on average, poorer, and the private sector has generally not found it profitable to set up health or education facilities under these conditions. To provide universal access and to prevent the poor from being excluded from social services, governments have had to subsidize provision.

Efficiency considerations also call for an active government role. Both health and education have characteristics of merit goods, that is, they generate value to society above and beyond their utility to the private individual. For example, education increases the productivity and earning capacity of individuals. However, a well-educated workforce is believed to have an even greater positive impact on economic growth (Mankiw et al., 1992; Task Force on Higher Education and

Society, 2000). Similarly, immunization against infectious diseases provides benefits to the individual, but also provides a benefit to society because it reduces the spread of disease to others. In such cases, rational individuals will purchase less of the service than is socially optimal. It is efficient for the government to subsidize such goods, thereby lowering their price and encouraging greater use. In the case of pure public goods where no one can be excluded from consumption, such as vector control to prevent such diseases as malaria or schistosomiasis, it is efficient for the government to take on the full cost.

There are good theoretical reasons for the government to be involved in financing social infrastructure. However, there is an important conceptual distinction between the financing and the provision of social services. In the past, governments have tended to finance and deliver services, with financing coming for the most part from general tax revenues. The private sector has generally offered private delivery of higher-quality services at higher cost, but the prevalent belief is that the private sector in general is more accountable to consumers, is more cost-effective, and uses better management techniques and more innovative approaches than the public sector. Private provision of services has the potential to reduce the government's fiscal burden and encourage better resource utilization, but because of the issues of equity and efficiency it cannot be relied upon to deliver a comprehensive system on its own. Therefore a mix of private and public provision and financing might form the best basis of accessible, good-quality health care.

One approach to accessing private financing has been to charge user fees for government-provided services in the case of both health care and education. The major drawback of user fees is that demand for health and education services tends to be highly elastic, and even low user fees discourage use by the poor, limiting their access to services. Evidence from Indonesia shows that raising user fees for health care results in adverse health outcomes for the poor (Strauss and Thomas, 1998). Means-tested subsidies would be the most efficient way to ensure universal access. However, means testing is costly,

inefficient, and can create welfare dependency. Even when user fees are charged, they generally offset only a small part of the cost of social service provision.

### **Social Insurance**

A number of Asian countries are exploring social insurance systems. Health-care insurance is a way to pool risk across time and across individuals to alleviate the burden of catastrophic illness. In the case of social insurance, there is a compulsory contribution to a social insurance plan. The compulsory nature of health insurance avoids two major problems that private insurance schemes face: adverse selection and cream-skimming. When not obligatory, sicker people have more of an incentive to buy insurance than do healthy people, which drives up costs for insurers (adverse selection), who then have an incentive to try to insure only the healthy (cream-skimming). Together these lead to ever higher premiums and lower coverage. Mandatory social insurance typically pools the risk across individuals, although there are other forms. For example, Singapore has instituted medical savings accounts that require individuals to invest money in a personal account that is available for use when health care is needed. Such accounts spread individuals' risks over time, but do not provide much protection against catastrophic illness, as individuals are only covered to the extent of funds in their accounts.

Social insurance programs pay for privately provided health services through funds that are generally collected as an earmarked payroll tax. This allows individuals to access higher-quality private care, while freeing up government health-care resources that might otherwise be used to provide public tertiary care services. These resources can then be shifted toward more cost-effective expenditures such as public health services and preventative care. Many of the wealthier Asian economies, such as the Republic of Korea and Taipei, China, already have universal social insurance coverage. The need to ease the budgetary burden of health-care coverage, and the

desire to take advantage of the benefits of private provision, are leading other countries such as the PRC, Indonesia, Malaysia, Mongolia, Thailand, and Viet Nam to evaluate the benefits of introducing social insurance systems.

Countries with successful social insurance systems instituted them when their economies were relatively advanced, with high degrees of urbanization and industrialization. The issues involved in implementing such a system in poorer, more rural economies could be quite different. The collection of social insurance funds is considerably easier in the formal sector. Enforcement of premium collection in the rural, informal sector will be extremely difficult and is unlikely to be cost effective. Similarly, access to high-quality, privately provided tertiary services will be considerably greater for urban populations. Provision of services to rural populations is therefore likely to continue to fall to governments. The danger of social insurance systems is that they could create a two-tier system of health care, with poor rural populations being limited to low-quality public services while urban populations have access to higher-quality private services (Gentler, 1998).

While there are certainly problems associated with the social insurance approach in poorer, more rural economies, the provision of social services for a rapidly growing population is placing a tremendous burden on the governments of poor Asian countries. Developing innovative approaches for providing and financing these services is necessary to ensure universal access to high-quality health care and education to rural populations. The private sector can be an important resource in this endeavor, even if its primary role is to lift the burden of provision and financing in urban areas to free up government resources for the rural sector.

## **MICROFINANCE**

Access to credit has always been an important factor in determining the QOL in rural areas, from the perspectives of

both investment and consumption. Investment loans can improve income generation in both the agricultural sector and nonagricultural areas such as small-scale manufacturing. Consumption loans enable the poor to reduce the variability of consumption and to withstand shocks in income, which can be frequent in an agricultural setting. The importance of having safe and accessible savings institutions is also now becoming more apparent to development practitioners. Household savings are another key factor in determining the ability of families to smooth consumption, and effective institutions for financial intermediation enable the mobilization of rural household savings for the process of rural development.

Up to 80 percent of households in developing countries do not have access to institutional finance (Robinson, 1997). The problem is even more highly concentrated in rural areas, where large segments of the population lack sufficient collateral to obtain loans. Much of the finance in rural areas tends to be informal, conducted through local money-lenders and landlords. While borrowers can take out loans for both consumption and investment, these markets are generally exploitative, with monopoly power enabling lenders to charge extremely high rates of interest, especially for lower-income borrowers.

Although some scholars have argued that these lenders provide an important service at a reasonable cost (Von Pischke et al., 1983; Von Pischke, 1991), others have noted that each money-lender or landlord will have particularly good access to information on creditworthiness, and often will also have interlinked contracts among a small group of borrowers. Among these borrowers, a money-lender will face low transaction costs and risk of default. Other lenders, who lack this information and have higher transaction costs and less protection from default, have a lower incentive to lend within this market. This creates a situation of monopolistic competition that enables money-lenders or landlords to charge very high rates of interest (Hoff and Stiglitz, 1998; Robinson, 1998).

Governments in many Asian countries, acknowledging the importance of credit for investment purposes, set up government-funded programs to provide subsidized credit for

agricultural investments (for example, India's Integrated Rural Development Program). These programs were based on the assumption that rural inhabitants were too poor to save. Their aim was to provide cheap credit targeted at particular agricultural inputs and investments rather than to develop financial intermediation or to mobilize rural savings. The high rate of debt forgiveness that characterized these programs, and the fact that many of the loans were captured by wealthy, politically connected landlords, has resulted in programs becoming economically unsustainable. Not only were the loans inefficient, but also the availability of this credit is believed to have been destructive of the creation of viable commercial microfinance (Yaron and Benjamin, 1997; Meyer and Nagarajan, 2000). Furthermore, most programs did not provide credit for nonagricultural activities, effectively excluding many of the most vulnerable members of rural society and limiting the development of micro-enterprises. This has been particularly costly as population growth has increased the pressure on agricultural land and heightened the importance of diversification.

The past two decades have seen the development of new models of microfinance by the private sector, NGOs, and the State. By targeting low-income households, and by providing credit that is often collateral-free at significantly lower interest rates than the informal credit market, these institutions enable the development of micro-enterprises in rural areas and provision of income-generating opportunities to poorer segments of the rural population. The ability to alleviate poverty through sustainable finance has captured the attention of much of the international donor community, and microfinance is becoming an increasingly important factor in rural development. This section examines two models of microfinance, the Grameen Bank and the Bank Rakyat Indonesia, and evaluates their lessons for policymakers. Further information on the development of microfinance in rural Asia, from the financial market perspective, is described by Meyer and Nagarajan (2000). For a more global and multidisciplinary treatment of microfinance see Robinson (2000).

## **Grameen Bank**

The Grameen Bank in Bangladesh is known internationally as a pioneer of microfinance. This NGO started in 1976 as an experiment. It became an official financial institution in 1983 and has now grown to service more than half the villages in Bangladesh. The Grameen Bank provides loans to the rural poor in order to initiate small-scale income-generating projects. It specifically targets the 'functionally landless' (those owning less than one fifth of a hectare of land), and uses a unique approach to avoid the problems associated with lack of collateral and adverse selection that generally characterize rural finance. Prospective borrowers of the collateral-free loans must first join into groups of five. While loans are made to individuals, the entire group guarantees the loan, and must repay it if the individual defaults or every member of the group will lose access to future credit. This joint liability system effectively replaces physical collateral with social collateral as a means of selecting against high-risk borrowers and of providing an incentive structure for loan repayment.

Grameen makes loans averaging less than US\$100 for activities such as poultry farming, weaving, fan making, or sericulture. It also provides a wide variety of social services to its members, ranging from consciousness raising to training in functional literacy, health, and nutrition. It requires that its members attend weekly meetings and subscribe to '16 decisions' concerning personal improvement and social reform, such as a commitment to boil drinking water, to raise a vegetable garden, to not take a dowry from their son's bride or to provide a dowry for their daughter, and to not have a large family. It also provides regular training sessions in income-generating activities to improve the success of projects undertaken by its members.

An unusual aspect of Grameen's approach is that it lends almost exclusively to women, primarily because the loss of social collateral appears to be far more costly for women within Bangladeshi society than for men, and therefore loan repayment rates are higher for women. The efficiency outcomes

of such an approach are equivocal, as women are often constrained by social norms and domestic demands to undertake home-based income-generating activities which are less lucrative than options available to men. Pitt and Khandker (1998), however, find a greater impact on household expenditure of loans made to women than to men. They attribute this difference to the lack of wage-labor markets for women and the resultant production inefficiency of women's time, which access to credit can avert.

While the efficiency impact of the gender bias may be ambiguous, the positive social implications are clear. By changing the relative earning power of women within the household, access to credit can fundamentally alter the gender imbalance inherent in Asian culture. Furthermore, there is evidence that women's earnings tend to be used primarily to improve family welfare and children's education and nutrition. Participation in Grameen programs is found to have a significant effect on various aspects of women's empowerment such as economic security, political and legal awareness, and relative freedom from domination by other family members (Hashemi et al., 1996; Bernasek and Stanfield, 1997). This increased control over their lives can contribute perhaps more than anything else to the quality of women's lives. Of course, money is fungible, and the loan received by a woman may be often controlled either partially or entirely by either the husband or other members of her family (Goetz and Sen Gupta, 1996). However, Hashemi et al. (1996) show that even in cases where women do not control the loans they are more likely to be empowered by Grameen membership. If they do contribute to family income through their own income-generating activities, this probability is even higher.

At subsistence levels, small-scale income-generating activities can have an important impact on a household's abilities to achieve basic nutritional standards and to withstand illness or other shocks. Grameen is also believed to have had a strong impact in other areas such as raising school enrollment and increasing contraceptive use. These effects are difficult to verify, as there are selection biases that determine membership

of the Bank. On the one hand, the Bank targets poorer sections of the population, possibly leading to a negative selection bias. On the other hand, there is an incentive for the groups to pick members who are more responsible and stable, possibly resulting in a positive selection bias. Such issues make it difficult to evaluate the social welfare successes of the Bank. Pitt and Khandker (1998), in a study of three microcredit programs in Bangladesh including the Grameen Bank, do incorporate the effects of selection bias, and still find a significant marginal impact of credit on household expenditure. They also find that credit positively affects school enrollment rates of both boys and girls. The effect on girls' schooling is less widespread (they find significant results for the Grameen Bank, but not for other microcredit programs), and they attribute this to the close substitutability of girls' labor for women's labor: as credit provides the opportunity for self-employment for the mother, the daughters may be expected to take on domestic chores.

Morduch (1998) raises some doubts about these results. Pitt and Khandker (1998) based their work on the assumption that Grameen successfully targets the functionally landless, but the high level of mistargeting that researchers have found in Grameen's loan portfolio undermines this approach. Recent estimates find that less than half of the participants in these programs meet the targeting criterion of functional landlessness. Using a different statistical methodology, Morduch finds a negative marginal impact on household consumption. He disputes the schooling results, finding no clear positive impact from credit on school enrollment.

Morduch (1998) does, however, find positive effects for the participants of credit programs who meet the eligibility criteria. Rai et al. (1998) show that despite ineffective targeting, microcredit programs are able to reach the most vulnerable members of society—those least able to smooth consumption in the face of income shocks. Morduch also finds evidence that credit has been able to reduce the vulnerability of the poor by smoothing consumption over time. This has been accomplished by providing income-generating opportunities rather than consumption loans. Despite questions about the

extent of its impact on overall household consumption or children's schooling, the ability of Grameen to improve the lives of the poorest members of society is a substantial contribution to rural QOL.

The Grameen Bank has developed its credit capital based on money from donor organizations and from highly subsidized loans. Although it requires its members to save a small amount every month, it has not attempted to mobilize savings seriously. Its sustainability has also been seriously threatened in the face of the recent floods which have afflicted Bangladesh (see Chapter IV), as a large percentage of the Bank's members are not in a position to meet their payment schedules. While such regionally undiversified risk factors do present a threat to the Bank's operational sustainability, its ability to reach the very poor and its innovative group lending program have made it a model that has been widely replicated in Asia and around the world.

### **Bank Rakyat Indonesia**

A very different model of microfinance is presented by the state-owned Bank Rakyat Indonesia (BRI). While BRI is a large bank that provides corporate and international services, it has a separate local banking division that is responsible for providing microcredit to rural and urban areas. Local units offer savings instruments devised for local needs, and the system has been successful in mobilizing domestic and rural savings at a remarkable level, with deposits of approximately US\$3 billion by the end of 1996 (Robinson, 1998).

BRI provides rural loans for any productive activity and, while it does require collateral, field workers have some control over the nature of that collateral. The spread between interest rates on savings and loans is set sufficiently high to cover all costs, and it is not only completely sustainable, but turns over a significant profit. Remarkably, the BRI has been able to maintain this profitability even in the face of the regional financial and economic crisis. Unlike the Grameen Bank, it

functions entirely as a financial intermediary, and does not provide social services.

The BRI also supervises a system of village banks called the *Badan Kredit Desa* (BKD) system. These banks provide smaller loans and do not require collateral. Taking advantage of the government's highly developed administrative structures, village heads and village-level management commissions are used to allocate funds, avoiding the information constraints generally faced by formal institutions involved in rural lending. While these banks are often more convenient for villagers and provide small loans, they do not target the poor and often charge even higher interest rates than the BRI. Moreover, they depend on the particular political structures in place in Indonesia, and are therefore not easily replicable (Morduch, 1998).

Unlike the BKDs, the BRI local-unit system does provide a replicable model, as does the Grameen Bank. It is interesting to explore these alternative models when evaluating the role of the donor or policymaker in advancing microfinance. The trade-offs between these two systems, which are based on somewhat different philosophies, raise issues about the best way to improve QOL in rural areas.

### **Evaluating the Two Models**

The fundamental difference between the BRI and the Grameen Bank is self-sufficiency. BRI's local-unit system yields profits that have been used to subsidize less-profitable parts of the Bank. While the Grameen Bank has generally been able to maintain operational sustainability, it is fundamentally dependent on grants and soft loans to finance its loan portfolio. One reason is the lack of focus on mobilizing savings. Although the Grameen Bank encourages its members to save because it is viewed as a social good, it simply deposits these savings in interest-bearing accounts rather than investing them in its loan portfolio.

Another important factor explaining the inability of the Grameen Bank to survive without subsidies is that the interest rates it charges on loans are not sufficient to cover the market costs of inputs. Yaron (1992) developed the subsidy dependence index, which shows how much a bank would have to increase interest rates in order to operate without subsidies. Calculating the subsidy dependence index for Grameen Bank from 1985 to 1996, Morduch (1998) estimates that it would have had to raise nominal interest rates by 20 percent to 33 percent, bringing it in line with the effective interest rates charged by BRI. The welfare effects of such a change are ambiguous. While some have claimed that it is access to credit per se that is important to the poor, not access to cheap credit, the sensitivity of demand to interest rates is fundamentally an empirical question, the answer to which is likely to be highly context-dependent. Grameen attempts to target the poorest households. If the interest elasticity of these households is high, raising interest rates will severely limit their ability to take advantage of these credit opportunities. Thus, raising interest rates in order to achieve sustainability could come at the cost of Grameen's ability to target the very poor.

As discussed earlier, the Grameen Bank integrates its lending with a collection of social programs. While significant social benefits may arise from these programs, they come at a cost. The administrative and salary costs of the Grameen Bank as a percentage of its loan portfolio are significantly higher than that of BRI (Rhyne and Rotblatt, 1994), which is another factor in its continued dependence on subsidies.

Robinson (1998) argues for the separation of social and financial services, and urges governments and donors to avoid programs that link them on the grounds that such integration drives costs upward and renders microfinance initiatives commercially unsustainable. Robinson argues that programs directed at poverty alleviation are preferable to microfinance as mechanisms for aiding the poorest of the poor.

There is an issue as to whether it would be more cost effective to provide social services separately. The system that the Grameen Bank uses is time-intensive for both bank workers

and members. This in itself can be costly. However, the link between the services may deepen the Bank's work. For example, South Asian culture severely restricts the mobility of women. They are generally not allowed to associate freely with anyone outside the direct family, especially men. Their family members are unlikely to allow them to attend meetings that transmit the sorts of social messages that the Grameen Bank and other such microcredit NGO meetings offer, or to take advantage of the training sessions that these organizations provide. Requiring them to attend regular group meetings in order to obtain credit may make their attendance at these meetings more palatable to other family members, and these meetings can then be used for the provision of other services.

A more fundamental criticism is that the existence of such subsidized programs undermines the creation of commercially viable microfinance programs such as BRI. If the aim is to provide long-term and widespread credit, this is an important concern, because long-term dependence on subsidies may not be sustainable, and the model is harder to replicate on a very large scale. If widespread access to credit is more important than the provision of targeted cheap credit, then it is wise to eschew support of subsidized microcredit programs in favor of developing the regulatory and legal environments necessary for the creation of sustainable credit institutions, and funding their institutional development. However, these institutions do not best serve the needs of the poorest households. It is possible that the social benefits of subsidizing the institutions that target the poorest outweigh the benefits of serving a broader population. The answers to these questions are fundamentally empirical, and will probably differ in different settings. Although empirical work is still at an early stage, the widespread interest in microfinance as a tool for reducing rural poverty demands further research on its impact.

## LAND REFORM

The rural poor tend either to be landless or have very small landholdings, leading many analysts to argue that the roots of rural poverty lie in the structure of landholding (Singh, 1990). In rural settings, land ownership is also inextricably linked with political control, and administrative and political structures are often dominated by the landed elite. It is believed that land reform can be a critical policy tool for alleviating poverty and enhancing self-determination of the rural poor.

The term 'land reform' is used to refer to a collection of policies that attempt to alter the structure of landholding and tenancy. The two most viable land reform policies in a contemporary context are land redistribution and tenancy reform. Brief mention will first be made of two other aspects of land reform that have played a role in Asian development: the abolition of intermediaries and the consolidation of landholdings.

The abolition of intermediaries, particularly in South Asia, has been one of the more successful aspects of land reform. Around 1793, the British introduced a *zamindari* or permanent settlement system over much of South Asia. Under this system, feudal lords were given rights to collect rent from tenants in return for fixed revenue payments to the British. After independence, the political animosity toward these agents of the colonial power ensured the successful elimination of the *zamindari* system from much of the region by the 1950s, although Pakistan has been an exception. These reforms were successful, but they also were costly. Large sums of money were paid to *zamindars* as compensation, and many of them today are large agro-industrialists. Many managed to acquire ownership of land from which they previously only collected rent, and numerous tenants were evicted from these lands. Ray (1996) pointed out that many of the tenants who benefited from this reform and became landholders are now among the most powerful opponents of land-ceiling policies.

Policies to consolidate landholdings were undertaken primarily on grounds of efficiency, since a major problem in Asian agriculture has been the fragmentation of landholdings. While the problem increases with the size of the landholding, even small landholdings are highly fragmented. This is extremely inefficient as it causes a loss of time and energy in moving from one plot to another, a waste of land in boundaries, and increased difficulty in setting up irrigation systems. Consolidation is hampered by a desire not to slow wider reform efforts and by the complexity of evaluating land quality to ensure fair exchanges, making these reforms difficult to carry out. Nevertheless, consolidation has been achieved in some regions and, while the efficiency benefits are not under contention, some analysts claim that they have in fact been regressive, as rich farmers have been able to manipulate the system to gain access to higher-quality lands (Drèze et al., 1997). While the abolition of intermediaries and the consolidation of landholdings have played an important role in the past, they no longer play a significant role in the land reform debate.

### **Land Redistribution**

Redistribution of land from large landholders to landless labor or small landholders generally involves setting a ceiling on land ownership and confiscating and redistributing all land over that ceiling. In some cases it involves the purchase of excess lands that are then to be redistributed. It is interesting that land ceiling and redistribution policies, rather than presenting the usual equity/efficiency trade-off, have been advocated on the grounds of both equity and efficiency. Several studies have found farm size and yield per hectare to be inversely correlated (Sen, 1964; Saini, 1971; Heltberg, 1998). One reason is that, unlike most production processes, there do not appear to be significant returns to scale in agriculture. This has been attributed to the higher costs of supervision faced by larger farms compared to small, family-run farms. It has also been conjectured, based on nutrition-based efficiency wage theories,

that employment and output will increase if land is more equitably distributed. The contention is that wage levels below those that ensure adequate nutrition for laborers to work efficiently will encourage employers to hire laborers who have other sources of income. Providing some land to all workers will therefore increase employment. However, attempts to test the hypothesis of different wages for the landed and landless have not found strong support (Rosenzweig, 1980; Bardhan and Rudra, 1981).

Land redistribution policies raise certain ethical questions, but the equity advantages of these policies are clear. Not only does providing people with land enable them to break out of the cycle of poverty, it can also enable greater self-determination within political structures that are often dominated by the landed elite. At a structural level, changing the nature of the production relationship may provide the most fundamental tool for effecting widespread improvements in the lives of the rural poor.

There are, however, serious drawbacks to the policy of land redistribution. Implementation of such an extreme policy has, in most cases, faced insurmountable barriers. For example, in 1949 the (then newly created) Indian constitution granted states the right to enact and implement land redistribution laws, but the state legislatures were primarily controlled by the landed elite. Although many states enacted land ceiling laws, they were often designed with deliberate legal loopholes and were seldom enforced. Ceilings were often set too high, and loopholes enabled most landlords to distribute land among family members or to bribe village record-keepers to register land in the name of fictitious persons. Ray (1996) estimates that land ceiling laws have been enforced on less than 2 percent of the total operated land in India since independence.

In some cases, political circumstances have been favorable and land redistribution has been successfully implemented. For instance, the takeover by Chiang Kai Shek in Taipei, China in 1949 laid the groundwork for massive land reform. The Kuomintang realized that the support of the peasantry was an important factor in achieving military strength, so they had a

politically motivated interest in a more equitable distribution of land. They were outsiders and had no vested interests in the landed elite. A confluence of political factors thereby enabled the successful implementation of land reform policies.

### **Tenancy Reform**

Tenancy reform can take the form of either regulation of tenancy contracts, or 'land to the tiller' policies, with land given from owner to tenant. The system of sharecropping that exists in much of Asia has often been deemed exploitative and inefficient. The equity argument has been that the shares of output going to landlords are generally set at unfairly high levels. The efficiency argument points out that it is not in the interest of the farmer to use inputs and effort at the optimum level if the latter receives only a part of the return. This combination of arguments made tenancy reform a central goal of many Asian governments after World War II.

In recent years, however, the efficiency argument has come under increasing debate. While sharecropping might not be efficient in a world of perfect markets, it has been argued that it is a solution to a second-best situation. In the absence of efficient markets for credit and information, it may serve a useful function, and banning it outright without replacing it with other institutions capable of serving this function may deprive the landless of a valuable option. Sharecropping contracts are a way to share risk between the tenant and landlord, which can be critical in the absence of insurance markets. Contracts are often found to cover more than just crop shares. If inputs are contractually specified, inefficient allocation is less of a concern, and if landlords provide some or all of the inputs it alleviates the potential inefficiencies caused by lack of resources and access to credit faced by tenants. Links with credit markets, where landlords also act as a source of credit, can provide a monitoring mechanism, thereby reducing the moral hazard problems of insufficient labor inputs. Several studies have evaluated the efficiency of sharecropping in South and

Southeast Asia. A review of these studies by Rashid and Quibria (1995) found evidence on the inefficiency of sharecropping to be inconclusive.

Like land redistribution policies, many laws have been enacted for tenancy reform, and the problem once again arises in implementation. For example, there are numerous cases of mass eviction of tenants as a result of imminent legislation to guarantee security of tenure. Many of those tenants were hired as permanent labor instead, thereby worsening their positions. When contracts are legally regulated to give tenants a higher share, shares are often agreed to informally instead of formally, providing even less security for the tenant. However, there have also been notable successes in implementation of tenancy reform, generally where there has been broad political will. For example, in the case of Operation Barga, a sharecropper registration program in West Bengal in the late 1970s, the political determination of the communist government, backed by effective mobilization at the local level and strong popular support, led to widespread implementation of laws, many of which had been on the books since the 1950s. Based on Operation Barga, Singh (1990) identified four factors essential to successful implementation of tenancy reform: group action; public proceedings in order to verify claims of landlords and tenants; state power exercised on behalf of the tenant; and speed of implementation to prevent evictions and the changing of contracts before enforcement.

### **The Effectiveness of Land Reform**

While there has been much debate about the effectiveness of land reform in improving equity and efficiency, few comprehensive studies have evaluated the outcomes of successfully implemented reforms. A recent quantitative study on India by Besley and Burgess (1998) attempts to evaluate the effects of land reform on both the reduction of poverty and economic growth. Using panel data on 16 states between 1958 and 1992 they evaluated the impact of land reform as a

whole, as well as each individual reform. Their results show that land reform does reduce the rural poverty gap, and thereby reduces the gap between urban and rural poverty. Consolidation of land, a reform motivated by efficiency considerations, had no significant effect. Land redistribution was also found to have a negligible effect, which the authors attribute to limited success in implementing these reforms. Both tenancy reform and the abolition of intermediaries had a negative and significant association with poverty. Their results do, however, indicate something of an equity–efficiency trade-off, as tenancy reform was negatively related to agricultural growth, although consolidation of land was positively related.

Many Asian countries experimented with land reform policies in the postcolonial period, enacting laws to improve land distribution and tenant rights. As seen above, however, the extent to which these laws were successfully implemented varied widely from country to country, with East Asian economies such as the Republic of Korea and Taipei, China achieving significant redistribution, while many South Asian countries did not find the political will to carry out the reforms to the extent originally envisioned. The experience of each country is fundamentally defined by its unique political history, and it is difficult to provide firm guidelines for successful implementation of significant land reform. The countries that have achieved substantial reforms appear to have benefited from anomalous windows of opportunity—brief periods of time when political events have led to a confluence of interests between the politically powerful and the rural peasant class.

The potential power of land reform in improving QOL for the rural poor cannot be discounted. Changing the structure of production relations in agriculture not only improves basic consumption levels, it can also empower people politically and socially. However, from the perspective of the policymaker it is important to keep in mind that the political will required to achieve significant redistribution will be difficult to find, especially in stable capitalist democracies. Furthermore, the confiscation of property violates the most fundamental principle of capitalism, and it has been suggested that the threat

of such a prospect can in itself create critical inefficiencies because it discourages investment and accumulation. Although it is possible to purchase land for redistribution among the landless, this is a very expensive option, and it is unlikely that the money would be forthcoming to carry out such a policy at a broad level.

The difficulties inherent in the implementation of serious land reform policies suggest the use of what might be perceived as less extreme options for achieving the necessary changes. While it is crucial to change regulatory structures to secure equal inheritance and ownership rights for women, achieving broader redistribution or structural change through regulation appears to be more difficult. It may be possible to achieve some amount of redistribution through the use of progressive taxation. Other policies, such as ensuring access to credit at reasonable interest rates, can enable the landless to purchase land and break out of the cycle of poverty. While the effects of such policies may not be as widespread, these seemingly second-best options may actually have a higher likelihood of success in view of the often insurmountable political barriers to implementing successful land reform.

## CONCLUSION

The preceding two chapters have developed more fully the QOL model presented in Chapter III. Chapter IV explored the influence of institutions on QOL, while this chapter has considered policy options for improving QOL through modifying the institutional framework. The direct and indirect links between various aspects of QOL have also been highlighted, exposing the virtuous spirals that lie at the heart of successful policies to improve QOL.

Policymakers, however, do not have the luxury of working in a constant environment. The world is fast changing. The challenges rural Asia must face in the first half of the 21st century are explored in the following chapters.