I Introduction

Rural Asia has undergone an unprecedented technological and economic transformation in recent decades that has dramatically improved the region’s food security, reduced poverty, and raised incomes, even while the population continued to grow rapidly. This transformation was initiated by the green revolution in agriculture, the first major expression of the application of modern science to Asia’s agricultural problems. Yet serious problems remain. Despite substantial rural-urban migration, Asia’s rural population (about 2 billion) continues to grow and the vast majority of them still depend directly or indirectly on agriculture, forestry, or fishing for their livelihoods. This is placing enormous pressure on remaining natural resources; many resources have already been degraded to the point of declining productivity. At the same time, mainly because of the lack of development of supportive institutions, economic growth has not been adequately translated into broadly improved welfare: health and education services and infrastructure development have been inadequate in rural areas.

While the percentage of rural Asians who are poor has declined substantially, a remarkable achievement, more than 670 million rural people (one third of the rural population) still live in abject poverty. Most rural Asians must tolerate much lower levels of health, education, and general well-being than their urban counterparts. Many more rural people will migrate to urban areas in the next decades, adding to the congestion and environmental problems of the cities. But with continuing population growth, the number of rural Asians is not likely to decline any time soon; in fact there are likely to be 2.3 billion by the year 2020.

Unless something is done to relieve the pressure in rural
areas, conditions will worsen further as more natural resources become scarce and are degraded and as discontent grows about widening differentials between rural and urban income and quality of life. In some cases, there is even growing danger of social conflict and violence over the use of remaining resources, forces that could tear at the social fabric of many Asian societies. These problems will be particularly severe in South Asia.

The rural transformation is clearly not yet complete. A key challenge for national policymakers is to continue to promote rapid growth in rural areas while at the same time making growth more pro-poor and more environmentally sustainable. These three goals—rural growth, poverty reduction, and sustainable management of natural resources—are depicted as the three points of a triangle in Figure 1, the so-called “critical triangle”. The three goals are interlinked, but whether the relationships between them are complementary or competitive depends critically on the mix of policies and investment strategies that a country follows. Improvements in the quality of life for rural people, the ultimate objective of rural development, requires a high degree of complementarity among the three goals of the critical triangle.

Many Asian countries have made good progress on economic and agricultural growth in recent decades, but this has often been achieved at the expense of the environment and without generating sufficient benefits for the poor. But such tradeoffs do not have to be an inevitable outcome of agricultural growth. When supported by the right kinds of policies, investments, and institutions, technologically driven agricultural growth can be used to reduce poverty, reverse environmental degradation, and improve the quality of life for all—“win-win-win strategies” that fulfill all three goals simultaneously. More Asian countries can do a much better job in achieving such strategies for the future.

The current financial and economic crisis in parts of Asia has reduced the availability of government funds for agriculture and rural areas and for social safety nets, spurred reverse
migration to rural areas, paralyzed financial markets, and challenged accepted Asian thinking about governance structures. It has become doubly important for Asian economies to design their strategies for rural development carefully. The task is complicated by emerging new challenges that will change the context in which Asia’s rural economy operates. These include

- increasing forces of globalization, as trade barriers continue to fall and as new information and communications technologies link more and more people into a single “real time” world;
- a demographic transition resulting from several factors including declining fertility rates;
- a rapidly unfolding biotechnology revolution in agriculture;
- increasing scarcity of natural resources, especially land and water; and
• the need to reinvent governance structures and public institutions in response to increasing demands for greater devolution and democratization of public decisions.

Some of these challenges will offer important new opportunities for growth, but if not properly managed they could also have high costs for the environment and the poor. This is amply demonstrated by the current economic crisis in Asia: for example, inadequate governance structures, particularly over financial institutions, led to unnecessarily adverse impacts from one supposedly positive aspect of globalization, the freer flow of private capital and technology from abroad. Biotechnology will also offer important new and much-needed sources of growth in agriculture, but if these are not properly managed, they may prove of little benefit to the rural poor and potentially damaging to the environment. Other challenges such as deteriorating and depleting natural resources and declining public expenditure on rural areas will make growth more difficult and will need to be managed carefully to avoid such outcomes.

The primary objective of this report is to provide guidance to rural development specialists and policymakers on key options for forging development strategies that will improve the quality of life of the rural population in the years ahead in order to successfully complete the ongoing rural transformation in Asia. The report is a synthesis of five background studies prepared under the auspices of an Asian Development Bank study of Rural Asia undertaken during 1998/99. The rich diversity of experiences observed within rural Asia in recent decades provides fertile ground for drawing lessons about which policies work and which do not work for achieving the multiple objectives of growth, environmental sustainability, and poverty reduction. Asian countries clearly have much to learn from one another.

The report is structured as follows: Chapter 2 reviews the lessons from the rural transformation achieved so far. Chapter 3 discusses some of the most important emerging new challenges for rural Asia and suggests how these might best
be met. Chapter 4 analyzes future scenarios for Asia under alternative assumptions about levels of government commitment to rural investment and policy reforms; this chapter also lays out a vision for achieving, by the year 2020, a rural Asia in which there is little or no poverty or malnutrition and in which natural resources are managed on an environmentally sustainable basis, and then provides guidance on what it would take to achieve this vision. Chapter 5 contains the report’s conclusions and recommendations.
II LESSONS FROM THE RURAL TRANSFORMATION

Developing Asia as a whole has made remarkable progress since the food crisis years of the 1960s. Initiated by the green revolution, there have been substantial gains in food security, poverty reduction, and per capita incomes. To illustrate, the following dramatic changes occurred between 1970 and 1995:

- Although human fertility declined almost universally, Asia’s population increased by 60% with the addition of over one billion people.
- But cereal production almost doubled. One of the most remarkable aspects of the rural transformation was that nearly all the additional cereal production was obtained from a doubling of yields. The cereal area harvested barely changed, increasing only 4%. In other words, had cereal yields stagnated at the levels prevailing in 1970, it would now take twice the crop area to produce the same amount of cereal output in developing Asia.
- Hence, instead of widespread famine, food availability (measured as calories available per person per day) increased by 24%.
- And, driven increasingly by urban-industrial growth from the 1980s onwards and by growth in the rural nonfarm economy, incomes (measured as per capita GDP) increased by 190%.
- These changes also had a profound impact on poverty. In 1975, nearly three out of every five Asians lived in poverty, but by 1995 this ratio had fallen to less than
one in three. The absolute number of poor declined by 28%, from 1,149 million in 1975 to 824 million in 1995. These reductions in poverty would have been even more impressive if population growth had been slower.

As shown in Tables 1 and 2, these impressive gains mask considerable diversity of experience among countries. While some countries, particularly in Southeast Asia, have roared ahead from poverty to middle income within a mere three decades, others in South Asia have lagged behind. Even within countries that have done well in aggregate, the gains have not been shared equally; many rural households, disadvantaged groups and resource-poor areas have been left far behind. For Asia as a whole, an intolerable number of rural people still live in poverty. Women bear the maximum brunt of poverty and female-headed households are among the poorest. There has also been serious environmental degradation in many areas. Some of this has been in the green-revolution areas and is associated with the misuse of modern farming inputs. But much of the environmental degradation, particularly soil degradation and deforestation, has been concentrated in more backward areas that did not benefit from the green revolution. In these cases the problem was inadequate agricultural intensification, so that yield growth failed to keep up with population growth.

In thinking about approaches for achieving strategies that will improve the overall quality of life in rural Asia, it is useful to begin with a conceptual framework showing how the three goals of the critical triangle are impacted by government policies and strategies (Figure 2). Outcomes for growth, poverty reduction, and environmental sustainability are determined by the private and collective decisions of millions of rural people. They make decisions every day about agricultural and rural nonfarm production that affect incomes, employment, wages, food prices, and the distribution of land in rural areas. These decisions in turn are affected by weather and prior decisions about private investments in farm and rural
nonfarm businesses. Government impacts on the system in three major ways. First, it invests in rural people (health and education), in rural infrastructure (roads, electricity, communications, irrigation, etc.), and in agricultural research and extension, which in turn impact on private investment

Lessons from the Rural Transformation

Table 1. Indicators of Change in Asia, 1970 to 1995

| Indicator                              | India    | Other S. Asia* | P R Cb | Southeast Asiac | Developing Asia |
|----------------------------------------|----------|----------------|--------|-----------------|----------------|-|-|-|-|
| Population (millions)                  |          |                |        |                 |                | | | | |
| 1970                                   | 554.9    | 156.2          | 834.6  | 204.4           | 1750.2         | | | | |
| 1995                                   | 929.0    | 293.9          | 1226.3 | 343.7           | 2792.9         | | | | |
| % Change                               | 67.4     | 88.2           | 46.9   | 68.2            | 59.6           | | | | |
| Cereal Production (million metric tons)|          |                |        |                 |                | | | | |
| 1970                                   | 92.8     | 25.4           | 161.1  | 33.8            | 313.2          | | | | |
| 1995                                   | 174.6    | 48.1           | 353.3  | 73.6            | 649.6          | | | | |
| % Change                               | 88.1     | 89.3           | 119.3  | 117.8           | 107.4          | | | | |
| Per Capita Income (US $/Year)          |          |                |        |                 |                | | | | |
| 1970                                   | 241.0    | 187.0          | 91.0   | 351.0           | 177.0          | | | | |
| 1995                                   | 439.0    | 299.0          | 473.0  | 1027.0          | 512.0          | | | | |
| % Change                               | 82.2     | 60.0           | 192.6  | 189.3           |                | | | | |
| Calorie Consumption (Kilocalories/person/day) |          |                |        |                 |                | | | | |
| 1970                                   | 2083     | 2184           | 2019   | 1945            | 2045           | | | | |
| 1995                                   | 2388     | 2274           | 2697   | 2596            | 2537           | | | | |
| % Change                               | 14.6     | 4.1            | 33.5   | 33.5            | 24.1           | | | | |
| Cereal Area Harvested (million hectares)|          |                |        |                 |                | | | | |
| 1970                                   | 100.4    | 21.3           | 91.1   | 25.0            | 237.7          | | | | |
| 1995                                   | 100.2    | 26.0           | 88.2   | 32.9            | 247.3          | | | | |
| % Change                               | -0.2     | 22.0           | -3.2   | 31.6            | 4.0            | | | | |
| Cereal Yield (t/ha)                    |          |                |        |                 |                | | | | |
| 1970                                   | 0.925    | 1.197          | 1.769  | 1.352           | 1.317          | | | | |
| 1995                                   | 1.743    | 1.846          | 4.007  | 2.237           | 2.627          | | | | |
| % Change                               | 88.4     | 54.2           | 126.5  | 65.6            | 99.5           | | | | |

Notes:
* Bangladesh, Bhutan, Nepal, Pakistan, and Sri Lanka
b People's Republic of China
c Cambodia, Indonesia, Lao People's Democratic Republic (PDR), Malaysia, Myanmar, Philippines, Thailand, and Viet Nam

Cereal Production, Area Harvested, Cereal Yield: FAOSTAT at http://faostat.fao.org
Calorie Consumption: FAOSTAT at http://faostat.fao.org
and production in the farm and nonfarm sectors. Second, government sets policies about prices, land ownership, nonfarm activity, and credit availability and costs, which again impact on private investment and production in the farm and nonfarm sectors and also on labor, land, and agricultural markets and income determination. Third, government determines the type and effectiveness of public institutions that implement its policies and investment strategies. These institutions act as a filter that may facilitate or impede the effective implementation of government strategies.

The role of institutions is crucial in this regard. Even well-conceived strategies and policies will not achieve their desired goals if the institutions that are to implement the strategies are inefficient. The impact of well-functioning institutions becomes even more crucial when these institutions interact with markets and help translate government policies for the benefit of the markets and the private sector. The interaction of institutions and markets helps determine the outcome of crucial public investment. For example, access to resources

<table>
<thead>
<tr>
<th></th>
<th>South Asia</th>
<th>PRC</th>
<th>Southeast Asia</th>
<th>Developing Asia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poverty (millions)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1975</td>
<td>472.2</td>
<td>568.9</td>
<td>108.1</td>
<td>1149.2</td>
</tr>
<tr>
<td>1990s</td>
<td>514.7</td>
<td>269.3</td>
<td>40.2</td>
<td>824.2</td>
</tr>
<tr>
<td>Poverty (percent)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1975</td>
<td>59.1</td>
<td>59.5</td>
<td>52.9</td>
<td>58.7</td>
</tr>
<tr>
<td>1990s</td>
<td>43.1</td>
<td>22.2</td>
<td>11.5</td>
<td>29.9</td>
</tr>
</tbody>
</table>

* India, Bangladesh, Bhutan, Nepal, Pakistan, and Sri Lanka
* People’s Republic of China
* Cambodia, Indonesia, Lao Peoples Democratic Republic (PDR), Malaysia, Myanmar, Philippines, Thailand, and Viet Nam

Sources and Notes: The benchmark is the international poverty line, US$1 per day (Purchasing Power Parity, 1985 dollars). Data for the PRC, 1978, are for rural areas only. Data for South Asia, 1975, are based on estimates derived from similar trends across different national poverty line estimates. Data for Southeast Asia and the PRC, 1990s, are for 1995, while those for South Asia are for 1993.


Figure 2. Impacts of Government Policies on Growth, Poverty, and the Environment
and technology, the benefits of health and education services, and ultimately the distribution of production gains will be influenced by how well institutions function and how they interact with markets.

The final link in the system is population growth. Population growth helps determine the consequences of agricultural and rural nonfarm production, and thus the possibilities for achieving growth that is pro-poor and environmentally sustainable. Rural population growth exerts a downward pressure on wages, farm sizes, and per capita incomes and hence can contribute to worsening poverty and environmental degradation. Technological change in agriculture that raises labor productivity can offset part or all of these negative impacts, but only if labor productivity grows faster than the agricultural labor force. The green revolution was successful in achieving this in many areas, but in some areas population grew faster so the welfare of the poor stagnated or worsened despite gains in agricultural productivity.

Government investments in health, education, and rural infrastructure have an important bearing on fertility and death rates and rural-urban migration and hence on the growth of the rural population. These kinds of investments are often needed in addition to technological change in agriculture in order to resolve rural poverty problems. With declining population growth rates, a demographic transition has occurred in much of Asia, particularly East Asia. With declining fertility rates, the number of young children declines and the ratio of workers to dependents increases. This results in a beneficial impact on growth and per capita incomes even if labor productivity does not increase, and the faster the demographic transition the greater the beneficial impact.

Although not shown in Figure 2, the levels of achievement of growth, poverty reduction, and environmental sustainability feed back over time to influence future population growth rates, private investment, and production in the farm and nonfarm sectors, and even on government strategies themselves.
Several major clusters of lessons emerge from the Rural Asia Study that can form the basis for formulating strategies that will shape the future course of development, both economic and human, in rural Asia. These lessons can be summarized as follows:

- Agricultural growth is a prerequisite for economic development in general and rural development in particular.
- To reduce poverty and improve quality of life in rural areas, agricultural growth must be both pro-poor and environmentally sustainable.
- Promoting the growth of the rural nonfarm economy will greatly enhance the pace of rural development.
- Efficient rural financial markets play a key role in promoting rural development.
- It is necessary to ensure effective institutions for rural development.
- To improve the overall quality of life in rural areas it is necessary to go beyond growth, poverty, and environmental considerations and directly address specific concerns of particular relevance to rural Asia.

Each of these is discussed in turn.

**IMPORTANCE OF AGRICULTURAL GROWTH**

Historically, all the successfully transforming economies in Asia (except single-city economies like Singapore and Hong Kong, China) enjoyed successful agricultural revolutions prior to their industrialization. Most Asian countries began as predominantly agrarian economies in which the agricultural sector accounted for the lion’s share of national income, employment, and export earnings. After independence, most Asian countries depended heavily on export crops and inherited a stagnant, low-productivity food-crop sector. Coping
with the twin challenges of low and unstable prices for their exports and a growing inability to feed their populations was the key challenge for the newly formed governments. With uncertain foreign exchange earnings and limited ability to pay for food imports, increasing domestic food production to assure food security was a priority. Until the food problem was solved, the development of the nonagricultural sector was necessarily constrained.

A technologically driven transformation of the agricultural sector was a necessary condition for national economic growth. An agricultural revolution was needed not only to overcome the food constraint, but also to provide an engine of growth on the scale required to initiate the transformation of the national economy. The nonagricultural economy was typically too small to play this role, even if it could have depended on cheap food imports.

Rapid agricultural growth contributed to the economic transformation in a number of important ways. It supplied basic foods, raw materials for agro-industry, and exports and freed up foreign exchange for the importation of strategic industrial and capital goods. It released labor and capital (in the form of rural savings and taxes) to the nonfarm sector. It generated enormous purchasing power among the rural population for nonfood consumer goods and services and therefore supported rapid growth in services and trade in rural areas, and provided a nascent market for an emerging manufacturing sector. It reduced poverty by increasing labor productivity and employment in rural areas, by generating more remunerative opportunities for rural-urban migration, and by lowering food prices for all.

While an agricultural revolution was necessary during the early stages of the transformation, not all the countries that had successful agricultural revolutions went on to industrialize and grow rapidly. Several other key factors are also needed to enable countries to successfully convert agricultural growth into national economic growth. Among these requirements are the following:
Lessons from the Rural Transformation

• Agricultural growth must be equitable, so that it puts increased purchasing power into the hands of the rural masses and not just a privileged few. Although the green-revolution technology was, in and of itself, basically scale-neutral, access to rural resources—particularly land—has been a key determinant of the equitability of agricultural growth.

• A well-developed infrastructure is required to foster the links between the farm and nonagricultural sectors.

• As agriculture develops and food security diminishes as a major constraint, countries need to move quickly toward market liberalization and pro-trade and pro-investment policies. Protecting domestic industries and overvaluing exchange rates penalize agricultural growth and impede the development of competitive industries that should be at the forefront of export-led growth. They also shield a country from the new technologies that are embedded in many imports and that have the potential to raise economic efficiency and competitiveness significantly.

• Strong rural financial institutions are required to mobilize resources and allocate them efficiently to promote a wide array of economic activities. As agriculture develops, rural nonfarm activities become more dynamic. Both farm and nonfarm enterprises and households demand a broad range of financial services, including savings facilities, not just credit.

• Investment in human capital and especially in rural education is necessary to ensure continued productivity increases in agriculture and to allow rural workers to be more readily absorbed in nonagriculture if necessary.

The earliest emerging economies in Asia were successful in meeting these requirements. Several (Japan; Taipei, China; and the Republic of Korea) had major land reform that led to equitable agricultural growth; they also invested heavily in rural infrastructure and rural education and pursued pro-
growth macroeconomic and trade policies. The People’s Republic of China (PRC) had a successful agricultural revolution from a technical perspective, but was only able to take full advantage of this once it moved to the “household responsibility system,” which released labor to the nonagricultural sector and effectively put huge amounts of additional purchasing power into the hands of the rural masses. India and the Philippines have both had successful agricultural revolutions, but have been slow to convert these into rapid economic growth. In India, agricultural growth has been relatively equitable and rural infrastructure is well developed, but the country has only recently begun to liberalize its domestic markets and to move to pro-growth macro and trade policies. The results are encouraging, with national income now growing at more than twice the rate of recent decades. In the Philippines, on the other hand, agricultural growth has been highly inequitable, due mainly to the skewed distribution of landholdings, and rural infrastructure remains weak. Despite pro-growth macro and trade policies, overall performance in growth and poverty reduction has been disappointing because of the unequal distribution of wealth.

As the economic transformation of an economy advances, agriculture’s share in national income falls quite rapidly and its importance for national economic growth diminishes. The nonagricultural sector becomes the primary engine of growth and is no longer so dependent on resource flows from agriculture or on agriculture’s demand linkages. The economic problem is then to absorb workers released from agriculture at a sufficiently rapid rate to stop agricultural productivity (and hence incomes) from lagging too far behind the levels achieved in the nonagricultural sector. Typically, agriculture’s share of total employment falls much more slowly than its share of national income, with the inevitable result that labor productivity, and hence per capita incomes, in agriculture lag behind the nonagricultural sector.

However, even though agriculture’s role in national economic growth changes as the transformation proceeds, it should not be viewed as a “sunset industry”. Its importance
only declines relative to other sectors; total agricultural output continues to grow steadily. Indeed, for many Asian countries, it must continue to grow if they are to continue to meet their food needs. Total production of livestock and horticultural products has to grow even faster than the production of cereals to meet changing consumer demands as incomes rise. Total agricultural employment also increases until late in the economic transformation and in most Asian countries there are more workers employed in agriculture today than at any previous time in their history.

Agricultural growth also underpins much of the growth and employment in the rural nonfarm sector, because of the importance of its demand for farm inputs, marketing services, and agro-industry and because farm income accounts for the largest share of total rural purchasing power for nonfood goods and services. If agricultural growth were to slow down, it could jeopardize national food security and increase child malnutrition in many countries, cause significant new unemployment and poverty (particularly in agriculture and the rural nonfarm economy), and slow nonagricultural growth.

Agricultural growth must be accelerated in much of Asia. For many countries this will require reversal of recent slowdowns in their agricultural growth rates. Although much of the agricultural sector is private, a key lesson is that the required growth cannot be left to the magic of the marketplace alone. While the private sector has been playing an increasingly important role, the public sector must continue to play a key role in providing what have traditionally been “public goods” and this requires deliberate public interventions and appropriate and effective institutions to implement them. The most important that are necessary for agricultural growth can be grouped as follows:

- **Innovation.** Both public and private investments in agricultural research and extension are necessary to provide a continuous stream of yield-enhancing technologies that can be profitably adopted by
farmers. The green revolution has run its course; new scientific breakthroughs, such as may be offered by biotechnology, are now required to raise yield potentials. This is especially important because land and water are increasingly scarce in Asia and future agricultural growth will increasingly have to come from yield-enhancing technologies on already cropped land.

- **Infrastructure.** Investments are required in a) physical infrastructure, especially irrigation, roads and electricity (the importance of farm-to-market roads in determining marketing margins, agricultural profitability, and farm diversification cannot be overemphasized); and b) human infrastructure, especially education, nutrition, and health of rural people to increase their well-being and productivity.

- **Inputs.** Policies and investments must assure that farmers have access to a) key farm inputs (irrigation water, fertilizers, seeds, etc.), b) efficient rural financial markets that can provide them with a broad range of financial services at minimal transaction costs, and c) land through efficient sale and lease markets. Government’s role in these cases is primarily to create an enabling environment for the private sector to function efficiently.

- **Institutions.** It is essential to ensure the securing of property rights to land and, where needed, give property rights to women. This will encourage farmers to make long-term investments in land intensification and conservation. It is also necessary to increase farmers’ access to long-term credit to finance those investments. Public institutions that provide key public goods and services must be strengthened so that they perform efficiently and are accountable to the people they are intended to serve.

- **Incentives.** Nondiscriminatory price policies for agriculture, a progressive shift towards market
liberalization policies, including the removal of restrictions on imports and exports, and appropriate risk management options are all needed.

**MAKING AGRICULTURAL GROWTH PRO-POOR AND ENVIRONMENTALLY SUSTAINABLE**

Concerns about the adverse impacts of modern agricultural growth on the poor and on the environment have been widespread since the green revolution first began in the 1960s. The key lesson that emerges from past experience is that to be pro-poor, agricultural growth must be broad-based, involving small and medium-sized farms as well as large, women farmers as well as men, and backward rainfed areas as well as irrigated and high-potential rainfed areas. To ensure such broad-based agricultural development, policymakers need to

- ensure more equitable access to land for both men and women farmers. This may require land reform where appropriate, the introduction of efficient markets for sale and lease of land if possible, and the provision of secure ownership and tenancy rights as needed;
- ensure that agricultural research focuses on the problems of small farmers as well as large, and that to the extent possible, new technologies are scale-neutral and can be profitably adopted by farms of all sizes;
- invest in clean water, nutrition programs, and human capital, such as rural education, to improve the productivity of rural people, especially poor people and women, and to increase their opportunities for gainful employment;
- promote a wide array of viable and sustainable rural financial institutions that effectively and efficiently
meet the demand for financial services and that are accessible to the broadest possible range of rural residents;

• ensure that agricultural extension and education, as well as inputs and credit, reach women farmers and address gender-based constraints in land ownership and access to credit, training, markets, and decision-making;

• ensure the participation of all rural stakeholders, not just the rich and powerful, in setting priorities for public investments that they are expected to benefit from or to help finance;

• give higher priority to backward areas with high population densities; and

• avoid subsidizing inputs, as such policies contribute to overuse and waste, and lead to their concentration among the rich.

The shift to more intensive farming systems has helped relieve the pressure on the land base and slowed the conversion of forest, hillsides, and other environmentally fragile lands to cropping. But it has also brought new environmental problems through inappropriate management practices in the use of irrigation water, fertilizers, and pesticides. These problems have often been worsened by inappropriate policies that subsidized inputs, encouraging farmers to use these inputs in excess of economically and environmentally appropriate levels. A lot of recent environmental degradation in rural areas has little to do with modern farming systems, however. In particular, a great deal of deforestation and land degradation has occurred in backward areas that did not benefit from the green revolution and was driven by insufficient agricultural intensification relative to population growth.

Policy interventions that seek to overcome environmental problems in agriculture need to be based on a proper understanding of why farmers degrade their environment. Why, for example, do farmers often seem to overgraze rangeland, deplete soil nutrients and organic matter, and
overuse irrigation water, pesticides, and nitrogen, when these actions cause health problems and reduce future incomes for themselves, their children, and the communities in which they live? The answer lies with the incentives they face. Farmers are not irrational. On the contrary, they maximize income and minimize risk in a dynamic context and often under harsh conditions and serious constraints. They degrade resources when there are good economic and social reasons for doing so, i.e., when the benefits they obtain exceed the perceived costs that they, as individuals, must bear.

If the management of natural resources is to be improved, these economic and social incentives must be changed in appropriate ways. Several factors impinge on the incentives for managing natural resources. Policymakers can influence these incentives in the following ways:

- Improve the management and regulation of natural resources through institutional reforms and greater devolution of management decisions to resource users or user groups, wherever possible.
- Ensure that farmers have secure property rights over their resources. In the case of common property resources, community management arrangements should be strengthened.
- Establish resource monitoring systems and ensure that those responsible for causing environmental degradation are made accountable through appropriate taxes and charges.
- Correct price distortions that encourage excessive use of inputs including water and electricity. It is also necessary to educate farmers about the environmental effects of their actions, including “externality” problems where the consequences of environmental degradation are borne by people other than those who cause the problem.
- Ensure that agricultural research gives more attention to broader aspects of natural resource management, including the problems of resource-poor areas.
Particular attention must be paid to increasing yields in resource-poor regions, to sustainable pest control, to soil and plant nutrient problems, and to genetic erosion within major food crops.

In order to achieve strategies that attain the multiple goals of sustainable growth, poverty reduction, and improved quality of life, it is not sufficient to target single goals of the critical triangle irrespective of their consequences for other goals. The aim should be to achieve a high degree of complementarity among all three goals. For example, greater investment in the health and education of rural people, especially women and girls, and in population control, improved performance by public institutions, more secure property rights over resources, and more open and liberalized markets should contribute to growth as well as help poor people and improve the quality of life for all (See Box 1). They should also reduce environmental degradation. Strengthening the management of common property resources would not only help reduce poverty and environmental degradation but would also increase the productivity of these resources and hence contribute to growth.

But there could also be tradeoffs between goals. For example, recommendations for public investment in agricultural research and extension have different and potentially competing objectives when focused on different goals. To achieve more growth, agricultural research is best focused on the development and spread of yield-enhancing technologies in irrigated and high-potential rainfed areas where the returns to research have historically been the highest. To reduce poverty and environmental degradation, on the other hand, more research should be focused on rainfed areas, including many with low potential. But research for these areas is typically more complex and costly, and the net returns are less certain and more difficult to demonstrate. Given that funding for research is scarce, research institutions naturally prefer to work on the problems of irrigated and high-potential rainfed areas where they can expect to have a larger impact.
Part of the answer to this tradeoff is to allow the private sector to do more of the research for irrigated and high-potential areas where returns to investment are high, and to redirect funding for public research to the problems of poorer people and regions.

Similar tradeoffs can arise in targeting more resources for infrastructure investment in backward areas. Although this can be very beneficial to the poor and can reduce some of the worst environmental degradation, it may well involve some tradeoff with growth. An equitable distribution of land has traditionally been good for both growth and poverty reduction. This is because small farms have proved more efficient than large farms in much of Asia. But in some countries farm sizes are now becoming so small that some consolidation may soon be necessary to enhance efficiency and growth. This could lead to another example where more growth is achieved at the expense of the poor (See Box 2).

Pricing policies can have mixed outcomes for the three goals of the critical triangle. Liberalized markets can be good for growth and poverty reduction, but may have unfavorable impacts on backward areas with poor infrastructure because of their higher transport costs. Proper pricing of key inputs like water and fertilizer is good for growth and the environment in most areas, but again, backward regions facing high transport costs can suffer. Reduced access to key inputs like fertilizers may worsen poverty and soil fertility problems in backward regions. There has been a tendency in many countries in Asia to keep output prices depressed, particularly to maintain low food prices for urban consumers. While price stabilization policies do serve a purpose in reducing risk, keeping output prices low acts as a disincentive and results in loss of efficiency at the farm level. Setting the right priorities and envisaging the various outcomes of any policy become crucial.

The purpose of highlighting potential tradeoffs is not to argue against any of the three goals, but to help show why strategies that target multiple goals are not always easy to achieve. Nevertheless, the available evidence clearly suggests that most Asian countries could do much better in reducing
Box 1 – The Role of Education and Health Care in Improving Quality of Life in Rural Asia

Education and health care are two basic factors that contribute to quality of life. Education provides a way for individuals to participate fully in the development of society; it allows a more adaptable and productive work force that can adjust to technological change. Similarly, good health allows individuals to participate fully in economic activities and permits an active and reliable work force. Hence, education and health services are important components of government assistance in promoting development and welfare of rural populations in Asia. Indeed, the lack of such assistance in some countries is said to have compromised the full benefits of the green revolution. Overall, the evidence shows that despite marked improvements over time in the nature and availability of both health and education services and facilities in Asia, the benefits are enjoyed disproportionately in urban areas; rural populations are being left behind.

In education, there have been major changes in Asia over the past few decades. Primary school enrollments have risen dramatically; there has also been considerable growth in secondary and tertiary education. East Asian countries have the best record of educational attainment; this has contributed greatly to the exceptionally high income growth in these countries. The lowest literacy rates occur in South Asia.

Improved health facilities, especially hospitals, and technology, particularly in mass immunization campaigns, have reduced mortality rates in Asia substantially. However, there are marked differences between regions and countries and within countries. The PRC, Sri Lanka, and Viet Nam have made dramatic steps in improving health services by investing in countrywide

(continued next page)

the necessity for such tradeoffs. Where tradeoffs cannot be avoided, however, the answer may have to be some sacrifice in one or more goals, or an increase in the total resources allocated to rural areas (e.g., use additional resources for
Lessons from the Rural Transformation

primary health care systems. As with education, South Asia lags, having the major share of the world’s malnourished children.

Within countries, there is a general bias toward the provision of government-funded education and health facilities in urban areas, where they can be provided more easily and with more political advantage. The private sector has become increasingly involved in providing services, but again has focused on urban areas.

In rural Asia, education is clearly seen as the key to improving life, for example by enabling access to urban work and attaining social mobility. However, most rural populations have inadequate access to education due to such constraints as distance, costs, gender and social bias, lack of parental motivation, and cultural and language bias in curricula. Lack of teaching quality and poor facilities in rural schools are common additional problems. Local communities and educational institutions are using innovative approaches to raise funds, but with private investment in education growing, public-sector funds thus saved could be reallocated to rural areas.

As with education, health services in rural areas receive relatively less government assistance than in urban areas. There is a need to identify and bring about the use of more cost-effective technologies appropriate for the large rural areas found in most Asian countries. Nongovernment organizations and village health workers are being used in some countries, but the government needs to guide these approaches and to reallocate public health funding to rural areas where the private sector response is inadequate.


Box 1 (continued)

investment in backward areas rather than cutting investment in high-potential areas).
Box 2 – The Land Reform Debate

Land reform or the lack of it is frequently cited as a factor influencing both agricultural growth and the distribution of its benefits in Asian countries. The striking negative correlation between landholding and poverty has led many analysts to believe that the roots of poverty lie in the structure of landholding. Viable land reform policies are based on land redistribution and/or tenancy reform. Land reform has been advocated on both efficiency and equity grounds.

Land redistribution involves transfer of the control of land from large landholders to landless labor or smallholders. While this process might seem likely to result in loss of farm efficiency, several studies have shown a negative relationship between farm size and yields per hectare, implying that within limits, small is beautiful. For agricultural growth to be equitable, a prerequisite is equitable distribution of land.

Tenancy reform can be effected either by regulation of tenancy contracts or by confiscation of land from the owner to give to the tenant. The present sharecropping system is deemed both inefficient and inequitable: lack of property rights discourages farmers from investing in technologies that conserve and increase long-term productivity growth, while the landlord’s share of the

(continued next page)

TAPPING THE POTENTIAL OF THE RURAL NONFARM ECONOMY

The rural nonfarm economy is an extremely important part of rural Asia. It accounts for a large proportion of total rural employment (the range is from 20 to 40 percent) and total rural income (from 25 to 50 percent) in Asia. It is also an important source of income for women, small farmers and landless workers, as well as for the urban poor in rural towns. Formal manufacturing activities only account for a small part
Lessons from the Rural Transformation

of rural nonfarm employment in most Asian countries, typically less than 20 percent. Most rural nonfarm employment arises in service, trade, and household manufacturing activities. These are dominated by small, part-time, mostly family businesses that are highly labor-intensive. These activities depend to a large extent on local and regional demand and tend to grow rapidly in the context of rapid agricultural growth.

Past experience shows that to enhance the growth of the rural nonfarm sector, it is necessary to

- Give high priority to broad-based agricultural growth because this is the most important impetus for most rural nonfarm activity. Equitable and broad-based
agricultural growth is not only desirable for both growth and poverty reduction within agriculture, but the impact is multiplied to provide additional benefits within the rural nonfarm economy (See Box 3).

- Develop rural infrastructure. Villages need to be connected to local towns so that agricultural inputs and outputs can flow freely and so that people can go shopping. Rural towns also need good infrastructure, especially roads, electricity, schools, sewers, water, and communications, in order to attract new firms and to grow. In particular, rural areas must not be allowed to be left behind in the use of modern communications technology to forge links with larger markets. Since the transaction costs of poor infrastructure are borne unequally by the poor, improvements help level the playing field for the most disadvantaged.

- Promote a legal and regulatory environment (e.g., to secure property rights and enforce contracts) that will help to promote trade, commerce, and manufacturing.

- Provide training in relevant technical, entrepreneurial, and management skills. The rural nonfarm economy provides much of its own training through apprenticeship schemes and on-the-job learning, but in an increasingly technical and communications-oriented world, specialized training schemes (e.g., computing, accounting) are needed, including training for women, who dominate many service and trading activities.

- Pursue industrialization policies that foster the development of all kinds of rural nonfarm firms and not just manufacturing. Despite the relatively small importance of manufacturing in rural employment, policymakers have been enamored of this sector; rural industrialization policies have showered manufacturing firms with all kinds of preferential tax, subsidy, licensing, and regulatory benefits, as well as with targeted and subsidized credit and technical assistance programs. Moreover, these policies have typically
favored larger capital-intensive manufacturing firms (the lure of the shiny rice mill or shoe factory), and neglected small labor-intensive firms and informal household manufacturing activities. It is necessary to level the playing field, to revamp rural industrial-ization policies to a) be more inclusive, perhaps by redefining them as “rural enterprise” policies; and b) to remove all unnecessary subsidies and protective policies that prevent rural firms from becoming competitive in the marketplace.

To help ensure that growth of the rural nonfarm economy is pro-poor, it is necessary to offer training and financial services to all kinds of nonfarm businesses, including small, informal, part-time, home-based and women-headed establishments. Many of these establishments do not have access to credit, especially in their start-up phase, and rural financial markets should be strengthened to ensure that all creditworthy firms do have access to financial services. Targeted and subsidized credit programs have not been effective in achieving this goal (see below). Some rural nonfarm activities contribute to environmental pollution and degradation (e.g., tanneries, silk and cloth dyeing, and charcoal production). To minimize these negative effects, it is necessary to establish and enforce appropriate environmental safeguards. In addition, introducing safer and more efficient technologies in such industries almost always results in lowering pollution as well.

CREATING EFFICIENT RURAL FINANCIAL MARKETS

In order to boost agricultural growth, reduce poverty, and promote equity, governments in most Asian developing countries have intervened to provide assistance to small-scale farmers. A major component of such assistance has been
Box 3 – Linkages Between Agricultural Growth and The Rural Nonfarm Economy

In the process of rural transformation, the expansion of the rural nonfarm economy is one of the most important steps by which agricultural growth generates economic growth. In its early stage of transformation, the nonfarm economy produces mainly regional nontradable goods and is therefore dependent on agricultural production and farm incomes for its demand. The farm sector can contribute to the growth of the nonfarm sector through linkages with production, consumption, and factor markets.

As agriculture grows, it will use more inputs supplied by the nonfarm firms. At the same time, it stimulates forward production linkages in the nonfarm sector by providing raw materials for processing and distribution. Demand for inputs varies across agricultural zones and with technological change. Irrigated agriculture demands considerably more inputs than rainfed agriculture, while mechanized and animal traction systems require more tools, equipment, and repair services than do hand-hoe cropping systems. Technological change strengthens the linkage as it increases the demand for modern inputs, e.g., improved seeds, fertilizer, and pesticides.

As farm incomes grow, consumption increases; more important, it diversifies into nonfood goods and services, many of which are produced by rural nonfarm firms. The strength of the consumption linkages depends not only on the level of per capita farm income, but also on how that income is distributed. Broad-based agricultural growth involving small and medium-sized farms has the strongest consumption linkages to the rural nonfarm economy.

(continued next page)
Lessons from the Rural Transformation

Box 3 (continued)

Agriculture also affects the rural nonfarm economy through the labor and capital markets. Agricultural wages determine the opportunity cost of labor in the nonfarm sector, while seasonality of labor demand in agriculture affects availability. Nevertheless, wages can increase if the nonfarm economy is expanding due to increased demand and increasing labor productivity. This is a “pull” situation where the nonfarm sector is attracting labor out of the farm sector to better-paying jobs. Therefore, wages in the nonfarm sector will be higher than wages in the agricultural sector.

A converse situation can occur if there is a growing surplus of rural workers that the agricultural sector is unable to absorb at the prevailing wage. Workers are “pushed out” of agriculture into low-productivity work in the rural nonfarm economy. Since the push is from agriculture, farm and nonfarm wages are likely to be the same.

Data from selected Asian countries (Bangladesh, India, Indonesia, Pakistan, Thailand) show a positive relationship between agricultural income and the nonfarm share of total rural employment. Studies of rural areas in Asia estimate regional income multipliers ranging from 1.5 to 2.0: for each dollar increase in agriculture’s value added, there is an additional $0.5 to $1.0 increase in the value added of the nonfarm sector; 67 to 80 percent of this increment is due to household consumption linkages.


markets because of distortions in input and output prices, poor infrastructure, and other factors.

In the 1960s and 1970s such programs may have seemed a justifiable political response to the failure of existing markets to provide efficient sources of credit to meet the demand for funds. Time has shown government credit programs to be hugely expensive, however: their interest rates were not
adequate to cover the true cost of providing the credit. Hence the programs made the institutions providing them highly fragile and financially unsustainable and created a continuing demand for subsidized funds in order for them to continue operations. With their overriding emphasis on credit, the programs failed to mobilize the rural savings that resulted from dynamic and diversified growth in rural areas. Finally, they focused almost exclusively on agriculture and neglected the growing rural nonfarm sector.

Even by their own highly uneconomic standards, government-subsidized credit programs have failed, reaching only a small proportion of their targeted groups—and in general not the poor or women—let alone of the potential market for rural financial services. In most countries the bulk of the subsidized credit has gone to those who need it least: large landholders; most smallholders still continue to suffer from lack of access to institutional financial services. In addition, subsidized credit has proved highly inequitable, because the built-in subsidies are directly proportional to the amount of the loans: large loan, large subsidy; small loan, small subsidy; no loan, no subsidy. Subsidized credit has invited rent-seeking and political manipulation and thus has adversely affected governance of the financial institutions.

It is high time for Asia to shift the emphasis to market-oriented financial services for the rural sector and do away with the subsidized-credit paradigm. Several Asian developing countries, notably in Southeast Asia, have indeed undertaken a paradigm shift to more of a market approach to rural finance, but many have not and are paying the price in the form of costly, poorly performing institutions. There is an urgent need to promote the development of efficient rural financial markets with the institutional capacity to mobilize savings effectively and efficiently, leverage funds in the commercial markets, provide credit based on prudent banking principles in cost-effective ways, reduce their own transaction costs as well as those of their clients, improve management information and accounting systems, and manage risks to expand their services (See Box 4).
The transition to more efficient rural financial markets requires

- an improved policy environment that permits financial institutions to adopt pricing policies based on commercial considerations and eliminates political interventions in their operations;
- creation of an adequate financial infrastructure, including an effective legal and regulatory framework and reliable information systems to reduce information asymmetry in financial markets;
- the rehabilitation or closing down of government-owned agricultural and rural development banks that do not enjoy adequate autonomy and that lack professional managers to improve their services and make them financially viable and sustainable;
- investments in infrastructure and communications to drive down the transaction costs of providing financial services in rural areas; and
- the use by governments of new mandates, incentive structures, and staff training in existing financial institutions to develop their institutional capacity to respond efficiently to market demand: to create a more client-oriented service mentality, promote competition, offer a broader range of financial services including savings accounts, and to serve nonfarm rural people as well as farmers, women as well as men.

There is a need for efficient, cost-effective financial services for the poor, especially for poor women. Because of the unique difficulties of servicing the rural poor, including women, governments will have to continue to assist microfinance institutions in improving their commercial orientation and outreach effectively and efficiently through market-friendly policies. At the same time, other financial institutions should be encouraged to expand their services to the poor where it can be done on a commercial basis.
Box 4 – The paradigm shift in rural finance

A move away from government-subsidized credit programs began in some Asian countries in the early 1980s as a result of the negative evaluations of these programs and the financial drain they imposed, along with the success of some microfinance projects. Microfinance organizations in some countries introduced innovations that reduced lending costs and risks without the collateral normally required by banks; large numbers of poor borrowers had access for the first time to formal financial services.

The paradigm that emerged—the financial market approach—limited the market to financial mediation rather than being a tool to stimulate production, compensate for distortions in other markets, and alleviate poverty. In this paradigm, the fund sources are mainly voluntary savings deposits rather than government and donors; the institutions strive for sustainability, rather than depending on subsidies themselves. The problem of political intrusion is thus removed and real interest rates are charged on loans to borrowers, who are selected based on creditworthiness rather than on their “preferredness”. Borrowers are seen as clients choosing products rather than as beneficiaries of subsidized loans. Evaluation of success in the new paradigm (continued next page)

ENSURING EFFICIENT INSTITUTIONS FOR RURAL DEVELOPMENT

An important lesson has been that good policies and investments can go sour not because they are poorly conceived, but because the institutions that implement them don’t work well. There is a need to reengineer some public institutions, both to improve their performance and to better clarify their roles in a changing world. With the rapid emergence of the private sector in direct rural investment and an increasingly
Lessons from the Rural Transformation

is based not on credit impact on beneficiaries, but on the performance of the financial institution in terms of sustainability, breadth and depth of outreach, and quality of services.

Surprisingly, many countries have made little progress in adopting the new paradigm. However, three “flagship” institutions—the Bank for Agriculture and Agricultural Cooperatives (BAAC) in Thailand, the unit desa system of Bank Rakyat Indonesia (BRI-UD), and the Grameen Bank (GB) in Bangladesh—illustrate the possibilities. These institutions each serve millions of rural clients. BAAC is the most successful, having reached about 90 percent of Thailand’s farmers, directly or indirectly, in 1996. All three provide loans: to individuals in the case of BRI-UD, to groups in GB, and to both individuals and groups in BAAC. BRI-UD and BAAC accept savings deposits, while GB has compulsory savings. Of the three, only BRI-UD is subsidy-free and could have reduced its yield on loan portfolio in 1995 from 31.6 percent to 16.3 percent and still have remained independent: the other two institutions need to increase their nominal interest rates to become free of subsidies.


Box 4 (continued)

constrained public-sector capacity, there is a need to reorient and reform public institutions so that their approach is less top-down and market-inhibiting. As agricultural and rural development become more location-specific and decentralized, public institutions must be able to cope with, and respond to, a higher level of farmer and community participation. This will require much greater attention to the processes of governance, devolution, and local capacity building. These issues are discussed in chapter III.

While sufficient investment for rural development is necessary, the institutional context within which this
investment is made will determine to a large extent how effective the investment is and whether it achieves the desired goal. Similarly, the impact and efficiency of policies will also be determined to a large extent by the institutional framework within which the policies are implemented. Institutions can interact positively with policy and it is only through an appropriate link with the institutional framework that proper implementation of policies will be achieved.

Institutions develop as a response to the societies in which they operate and thus will vary with changes in social and cultural norms. These differences notwithstanding, there are common roles that all institutions must play in promoting the goals of rural development, such as providing goods and services of several kinds and enforcing laws, rules, and property rights; these roles do not vary widely from one society to the next. Moreover, because institutions have developed over long periods of time and are heavily influenced by social customs and norms, there is a tendency for institutions to suffer from inertia and to be generally slow to change their structure, practices, and behavior. This is true even when the external environment within which the institutions operate demands such changes. Another manifestation of this problem is that institutions tend to become suboptimal from both an individual and social or community perspective and can impede the process of development through the misuse, misallocation, or waste of scarce resources. Under such circumstances it becomes necessary to ensure change through appropriate intervention and action.

The way in which institutions regard and handle equity issues, especially gender issues, can greatly influence both the design and implementation of policies. For example, if the roles that women are expected to perform in the work force are limited by social and cultural beliefs, such a perspective will greatly influence policies to generate employment. Thus it becomes very important to change institutional views regarding gender roles if rural employment for women is to be broadened. It is necessary to develop an institutional framework for gender and to seek ways to achieve gender equity and empowerment.
Without these, the institutionalized structures that produce inequality and poor outcomes for women are unlikely to change. Autonomy and self-determination are goods that should be available to all, regardless of gender. In addition, access to education and jobs is not simply a means to better life outcomes, but is part of the very definition of a high quality of life.

There is a close relationship between the political framework and system and the functioning of institutions. Political systems and structures help shape the incentives for policymakers that will ultimately help influence the design of policy and its impact on development and the quality of life. There is also a close link between political institutions and economic governance. The quality and delivery of goods and services will be determined by the ways in which these services are provided. The trend toward decentralization—the reassignment of at least some authority and functions from the central government to lower levels such as provincial and local governments—has been a deliberate move to help improve economic governance. By being more democratic and more suited to the needs of local communities and individual stakeholders, decentralized structures are expected to be more efficient and transparent.

Decentralization involves the transfer of political, administrative, and financial functions and this requires major institutional change in the way the economy operates. Decentralization must be accompanied by capacity building at the local level if it is to succeed and achieve its desired objectives. It is not an alternative to central government functions, which must also be suitably altered, but a complement to achieve greater efficiency and equity. It requires much greater efficiency and coordination and necessitates more involvement of communities, civil society, nongovernment organizations (NGOs) and the private sector (See Box 5).

One of the main features of social organizations and civil societies is their institutionalized patterns of behavior developed in the pursuit of common or community goals. To build upon these patterns in a positive manner is to develop what has
Box 5 – The Trend Towards Decentralization

Decentralization and/or devolution of government services in developing countries has become increasingly common in the past few decades. This trend mirrors the generally successful decentralization that has taken place in a number of industrialized countries, such as New Zealand, Poland, and Hungary. In Asia, it is usually closely associated with the move away from highly centralized systems of government, with reform movements marked by demands for more competitive politics and greater popular participation in government. In countries as disparate in size and political systems as the Philippines and Nepal, there have been recent forceful moves to decentralize government. In others, such as Mongolia, which are setting up democratic government structures for the first time, decentralized government has become the model to follow.

Demands for decentralization are not new in many Asian countries. In recent years new factors have emerged that have accelerated the process, however. One is the impact of globalization. Better communications have made people at all levels of society more aware of what is happening in their own countries, as well as what is occurring globally. In this rapidly shrinking world, comparisons and informed judgments are much easier to make and more opportunities are available to be involved in governance. A second factor is the impact of the enormous economic and social changes that have occurred in the last 20 years. Liberalization, privatization, and other market reforms all require a different mode of governance. In addition, these changes have also underlined the limited capacity of central governments to handle adequately all the demands placed on them. Allied to both of these factors is the growing demand for participation. Although this varies among countries, many local communities are no longer satisfied to accept the dictates of a central government. There is a strong, growing voice for participation in governance. The perceptions of donors, which reflect the thinking of major

(continued next page)
sources of development financing in many countries, have also changed. Traditionally dealing only with central governments in their lending operations, believing that central governments alone had both the responsibility and capability to manage development, donors have recently shifted to supporting better governance and with it, greater local participation and autonomy.

Consequently, decentralization of government is now sought in nearly all Asian developing countries. It encompasses the transfer of both administrative and financial authority, since without adequate fiscal resources it will not work. It also involves the participation of local civil society, whether citizens’ groups or nongovernment organizations (NGOs).

Yet decentralization is not a panacea that will solve all problems. It requires full political will. Unfortunately, while this will is often expressed in rhetoric, it is not always backed up with full commitment. Political will alone is also not sufficient. Clear legal and administrative mandates are also highly desirable. The time needed for their establishment, however, may just create excuses for inaction by central authorities. Thus, more fundamentally, decentralization requires intensive interaction among stakeholders. But the process has no universal blueprint, given the varied and usually complex political, administrative, and social systems found in the developing countries.

Decentralization also has dangers. If not well managed, central governments could lose control over the macroeconomy as the result of uncoordinated local decisions. Regional disparities could be exacerbated, leading to economic and social tensions. Local governments could also fall under the sway of particular local interests, thereby undermining state power and accountability. Thus, decentralization is a double-edged sword. It is clearly the way to go, but it is not a simple or quick remedy.

come to be known as “social capital”. Social capital can help improve the efficiency of society by facilitating cooperation, trust, tolerance, and networks to channel governance. Sensitivity to the political, social, cultural, and institutional context (all of which are linked) and improving upon the existing norms of behavior in ways that enhance social capital are essential for policymakers. Such awareness can lead to an appreciable increase in the social and economic return on investment and help in improving the functioning of markets.

**IMPROVING THE OVERALL QUALITY OF LIFE IN RURAL AREAS**

Growth in per capita incomes is perhaps the single most powerful means of improving the quality of life. This impact is even greater when income growth is equitable and involves the poor and when incomes improve without degrading the environment. But improving the quality of life goes beyond these three goals. As illustrated in Figure 3, the quality of life is also impacted by past investments in health, education, and rural infrastructure; by policies that promote greater gender equity and the empowerment of rural people; and by the availability of effective safety-net programs. These factors contribute directly to improvements in the quality of life because they are things that people value in their own right. But these factors also contribute indirectly to the quality of life by making people more productive and more environmentally aware and hence increasing their contributions to growth, poverty reduction, and better management of natural resources. This is a virtuous cycle in which happier, better-fed, and better-educated people are able to do more to further improve the quality of their lives. The converse is a vicious cycle in which deterioration in the quality of life reduces people’s abilities to improve their lives, leading to further deterioration in the quality of their lives, etc.
Figure 3. Determinants of the Rural Quality of Life
Government investments and policies to enhance the quality of life directly are particularly important for the poor and for women, because the trickle-down benefits from growth may take too long to realize. In order to achieve higher quality of life in rural Asia, as well as striving for the three goals of the critical triangle, policymakers need to undertake the following:

• Raise levels of public investment in people (education, health, nutrition, etc.) and in infrastructure (roads, electricity, communications, etc.), which may have to go beyond their immediate economic justification (i.e., based on their expected impact on growth). Policies and investments for slowing population growth, crime, the use of drugs, and the spread of HIV/AIDS are particularly important.

• Target the poor through specific programs, such as land redistribution and tenancy reform, improved access to education and training, greater investment in infrastructure for resource-poor areas where many of the poor are concentrated, and improved and cleaner energy sources.

• Target gender inequities. Such policies must go beyond the simple provision of more schooling, health services, financial services, and employment for women and girls, important though these are, and tackle the institutional and cultural biases that result in discrimination against women in the first place. This will require changes in land and labor laws to remove legal constraints on women’s participation in decision making, improve their inheritance and ownership rights to land, increase their access to credit, and provide equal employment opportunities. It will also require more enlightened education programs for the young and greater empowerment of women in political processes (See Box 6).

• Create efficient safety nets to help the chronically poor who are unable for various reasons (e.g., disability, age, lack of basic skills or assets) to help themselves out of poverty and to provide a measure of income insurance
Lessons from the Rural Transformation

Box 6 – The Positive Impact of Gender Equity on Quality of Life

The view of gender issues as a component of quality of life in rural Asia does not simply mean looking at relative outcomes for men and women or whether there is discriminatory access. Rather, it means viewing gender as a social institution that organizes the opportunities that are open to people and defines their social roles. The situation of rural Asian women points to the paramount importance of gender in an examination of quality of life because it raises the question: Whose quality of life?

Extreme gender inequality, which takes myriad forms including denying women access to health care, education, and jobs; physical and psychological abuse of women; and female infanticide, selective abortion, and nutritional deprivation also characterize many parts of rural Asia, especially South Asia. For many, being female and living in rural areas is doubly discriminatory. Indeed, in many Asian nations the gender gap in schooling, literacy, health, social participation, and wages is driven by the rural sector. For example, in Nepal, while urban boys aged 15 to 19 outnumber their female counterparts in school enrollment (45 percent versus 32 percent), the gap is much more pronounced in rural areas (25 percent versus 6 percent). In India, urban women can expect to live about three years longer than men, but there is no gender difference in rural life expectancies. In many countries the combination of high female involvement in agriculture in rural areas and the large gender gap in agricultural wages puts rural women at a disadvantage. These examples demonstrate that gender gaps in core quality of life indicators are larger in rural Asia than in urban Asia.

One of the most formidable challenges facing rural Asia involves overcoming strong and persistent gender inequalities, especially in South Asia. Improving women’s quality of life will have a multiplier effect for society as a whole. Increasing women’s

(continued next page)

for rural people in areas subject to catastrophic climate risks like drought. Financial markets should not be used to supply so-called loans to those affected by disaster when there is no real intention to collect;
education not only raises their own quality of life, but also the quality of life of other family members and even of society at large. Policies that promote gender equity, such as establishing female quotas for elected office, may have a symbolic importance if in forcing men to find and groom women for office, it makes them question previously held ideas of gender. The presence of women in governing bodies may also force citizens to rethink their notions about women’s capabilities or encourage other women to become socially active.

Increasing gender equity may also make the process of development more sustainable. For example, women’s schooling has a bigger social multiplier on family health than men’s schooling, because of women’s roles as mothers, wives, and daughters-in-law. Similarly, mothers’ level of educational achievement (which has a higher impact on children’s school performance than their fathers’ level) may eventually translate into higher wages for children when they enter the workforce. Another reason education for women appears to have positive effects on health and other outcomes is that it empowers women to make nontraditional decisions, like controlling their fertility.

Targeting programs and policies to women can also result in lower fertility, an important step in improving overall rural quality of life. Higher rural fertility is partly explained by women’s poor access to education and job opportunities. Increasing educational opportunities for girls by providing better access to schools, enforcing compulsory school attendance, or providing scholarships can therefore have long-term demographic benefits. Creating labor market opportunities and providing microcredit for women, as they raise the value of women’s time, will also make children more costly and therefore bring down fertility rates.

III Meeting the Challenges of the Future

While some Asian countries struggle to catch up, the rest will need to continue to increase incomes and the quality of life in rural areas. This will have to be done even as rural populations continue to grow. Failure to do so will lead to accelerated migration to the cities, a process that will have its own social and environmental costs, and a growing risk of social conflict and violence over the use of natural resources. Rapid economic growth must continue in order to provide the means to solve these problems. But at the same time that growth must be equitable and environmentally sustainable. As already seen in Chapter II, past experience suggests some key elements for these strategies. These need to be more widely adopted.

The recent financial and economic crisis in Asia has provided some important lessons and undeniably altered the way in which governments and policymakers need to tackle the problems facing their economies. Rural Asia, in particular, will be challenged by the legacy of the economic crisis for some time to come. The East and Southeast Asian countries that have been most affected by the crisis will need time to recover from the loss in real income and the necessarily drastic cuts in government investment in rural areas. Many investments have long lead times (e.g., agricultural research) and the consequences of the cuts will take many years to work themselves out; they will also impede agriculture’s ability to respond to improved incentives for growth as a result of the currency devaluations. In addition, there has been reverse migration back to rural areas in some of the hardest-hit countries; reassimilating these people will take some time to complete. It
will also take time to reconstruct domestic financial markets and hence to restore the flow of credit to businesses and consumers. Governments and donors need to give high priority to restoring these investment fundamentals in the crisis economies.

Another legacy of the crisis that must be confronted is that the severe immediate negative welfare effects may be intensified and prolonged. The negative social effects of the crisis have been compounded by a lack of social safety nets for the newly unemployed and the newly poor. Traditional social systems that have supported the poor in the past, including close family ties, community support, and the ability to return to subsistence agriculture, have been weakened by the development of a dynamic urban economy. New safety-net systems have not been put in the place of traditional systems. Social unrest in Indonesia indicates how fragile and growth-dependent the social equilibrium has become in many of the rapidly developing Asian economies. None of the crisis economies except the Republic of Korea has an unemployment benefit scheme or other social-welfare programs.

The economic distress has also generated a crisis of confidence that may reverberate more widely in Asia. Since institutional failures were at the heart of the crisis, the key lesson is not that market-led growth is bad, but that more appropriate governance structures for key institutions are needed for managing it. Effective safety-net programs need to be in place to protect vulnerable people in times of crisis: public investment in key public goods must be sustained.

Evidence indicates that women are disproportionately affected by all social dimensions of the crisis and are in the greatest need of safety nets. The traditional gender difficulties faced by women have been exacerbated by the crisis. In addition, women tend to be the first laid off when companies feel the pressure of labor costs (on the other hand, they tend to find work in the informal sector more easily, they tend to work in the less affected export-oriented sectors, and they are sometimes substituted for more expensive male labor); girls are pulled out of school before boys; and women face
increasing difficulties in providing social services for their families.

Along with recovering from the economic crisis, and learning from it, Asian countries must also adapt to a changing world, one that will be increasingly impacted by

- globalization;
- demographic transition;
- an unfolding biotechnology revolution in agriculture;
- increasing water scarcity and land degradation; and
- the need to reinvent governance structures and public institutions.

This chapter will lay out options for meeting the new challenges of the future in ways that exploit their growth opportunities, but which are also pro-poor and environmentally sustainable.

**MANAGING GLOBALIZATION**

Globalization offers opportunities for further economic growth in Asia. Market-oriented policies that have favored economic liberalization, open markets, and integration with the global economy have been very successful for both rural and general economic development in Asia. The process of globalization, including increased interlinkages across countries and expanded trade, financial, and information flows, provides new technologies and markets and new sources of finance. But globalization and economic liberalization carry with them risks that have been driven home by the Asian economic crisis. These risks include

- the inability of many domestic industries to compete in the short term;
- the potential destabilizing effects of uncontrolled short-term capital flows;
• increased exposure to price risk; and
• worsening inequality as many poor people and backward regions get left behind.

To avoid the pitfalls of globalization and economic liberalization, each of these risks needs to be addressed and policies and strategies adopted that negate or minimize them.

**Competition**

World markets are ruthlessly competitive and offer little succor to the weak and inefficient. Some sectors in many Asian economies are not well positioned to compete in world markets and in some cases (e.g., Central Asia) whole countries are not yet ready. The pace of economic liberalization must therefore take into account the institutional capacities and political realities in each economy. Some of the less developed economies of Central Asia and South Asia may need a managed transition period in which agriculture and domestic industries can gear up to compete and during which a technological dynamism can be established that will help ensure that they can continue to compete over time. The emerging evidence from economic reform in Central Asia and Eastern Europe suggests that more rapid and comprehensive reform can be conducive to a quicker economic turnaround and faster growth (although, maybe, at a higher short-term social cost).

The PRC, on the other hand, has had great success with a gradual approach, yet success was arguably best in the agricultural sector, where reform was fastest, and much less so in the state-enterprise sector, where reform was slowest. Viet Nam undertook highly successful and relatively rapid economic liberalization and stabilization reforms in 1989, but has encountered difficulties in the slow-reforming state-enterprise sector. Gradual reform typically allows for a more comprehensive reform process, but a lack of urgency for thorough reform can bring about inappropriate and incomplete
reforms or lead to stop-and-go periods, as the PRC has experienced during its protracted reform process. Nevertheless, political and social stability during the transition process may be as important to success as economic stability and may dictate a more gradual approach to reform than is optimal from the point of view of efficiency.

The newly industrialized economies of East Asia offer some important lessons about industrialization policies for managing the transition. Many of them used directed interventions to promote specific industries, such as targeted credit, export promotion, tax benefits, and import protection. It was expected that these policies would also create spillover benefits to other industries, help enhance the overall competitiveness of the economy, and raise the future technological level of the economy. But the results of these policies have been quite mixed, especially in the long run. Many industrial policies were implemented without a sound analysis of the market failures they were intended to correct; they ignored market signals in attempting to achieve efficiencies; they underestimated the informational requirements necessary for effective intervention; they overlooked the limited capacities and capabilities of government; and they overestimated the human and other resources available to build efficient industries. Moreover, attempts to transfer the “lessons” of this kind of industrial policy to the rest of developing Asia have been largely unsuccessful.

Protection of some industries by definition penalizes other industries. A clear example of this is the rural nonfarm sector. Recent macroeconomic policy reforms that have benefited the agricultural sector should have led to positive growth multiplier benefits for the rural nonfarm economy. The policy reforms have also favored tradable goods production in general, and this should have been directly beneficial to much rural industry. But policies to assist the rural nonfarm economy have still generally favored manufacturing rather than service activities and large- rather than small-scale units of production. In many cases, small firms have effectively been placed at a competitive disadvantage against their larger-scaled
rivals (for example, they do not receive the same subsidies and tax benefits), and this has encouraged more capital-intensive patterns of development than is optimal.

A better approach to dealing with the uncertainties of globalization can be described as market-friendly policies. They can be considered as an intermediate approach, more proactive than laissez-faire policies and more cautious than active industrial policy. Market-friendly policies focus on the liberalization of trade, accompanied by decreased government regulation and intervention, and thus less rent-seeking—all conducive to the functioning of a market economy. Under market-friendly policies, exporters face fairly uniform incentives for exporting commodities across industries; both imports and capital flow should be gradually liberalized as institutional capacity improves; and the fiscal deficit and share of government expenditures in GDP are maintained at comparatively low levels. Rather than favoring specific industries, governments should focus primarily on prudential regulation and provision of public goods, particularly through heavy investment in infrastructure and human capital. The market-friendly approach encompasses macroeconomic stability, human capital formation, openness to international trade, and an environment conducive to private investment and competition.

Destabilizing Capital Flows

Flows of private capital from abroad are fickle and can be destabilizing if not properly managed. Most concretely, the economic crisis raised serious questions about the convertibility of short-term foreign capital inflows. Foreign direct investment and other long-term, relatively stable investments make significant contributions to economic growth, but the benefits of short-term international capital are small and uncertain because, unlike foreign direct investment, short-term capital does not bring along technology and management innovations. Moreover, when savings rates are already high and marginal
investment is misallocated, short-term capital greatly increases the vulnerability of the economy. Management of international capital flows should therefore focus on the creation of an environment conducive to long-term investments and discouraging to short-term capital inflows. Tax incentives and other distortions that favor short-term inflows over long-term investments should be eliminated. Moreover, the importance of sequencing of reforms was shown by the high costs of moving to free convertibility of short-term capital before effective financial intermediation and prudential regulation were in place. Both prudential regulation of currency positions of banks and strengthened supervision of these regulations and other risk-management procedures are required. In those Asian developing economies that are plagued by weak institutional capacity and financial systems, selective controls on short-term capital may well be appropriate. Temporary, market-oriented controls on short-term capital inflows combined with domestic reforms and greater disclosure may help reduce the frequency and magnitude of shocks.

**Price Risks**

There is also the possibility of increased price and economic risks as domestic markets become less insulated from global forces, although the evidence of this is highly mixed. While there should be an immediate increase in price risk for domestic producers when a country’s price stabilization policies are dismantled, this may eventually be more than offset by greater stability in world markets as more countries liberalize and pool their market risks.

Some evidence for this is to be found in a recent FAO study of changes in interyear price variability of cereals from 1972 to 1996. The study concluded that there had not been any increase in interyear variability in world cereal markets. Recent price changes do not appear to manifest anything unusual and are not outside the range of normal annual variations. Furthermore, analysis of the intrayear cereal price
variability showed that, if anything, the tendency is towards a decline in variability.

But even if domestic producers are confronted by increases in price risk, there are better ways of managing such risks than returning to trade protectionism and costly price-stabilization polices. Futures and options markets now exist for key agricultural commodities in many industrialized countries and are also beginning to emerge in developing Asia. These markets can offer an efficient and cost-effective way of managing price risks.

In order to reach the mass of small Asian farmers, however, new forms of financial instruments need to be created within Asian countries. Appropriate intermediaries (e.g., banks or farm cooperatives) could offer forward price contracts to farmers and then use national and international futures and options markets to hedge the associated price risks.

Worsening Inequality

Globalization leads to growth that often favors the middle classes over the poor and urban over rural areas. This is not to say that the disadvantaged do not gain; globalization can bring new employment and tighter labor markets and it can open up new opportunities for commercial agriculture even in more remote areas. But there is risk that the gains may be highly skewed and that the distribution of income may worsen. Moreover, economic downturns associated with the higher risks of greater exposure to world commodity and capital markets inevitably impact more severely on the poor.

Avoiding worsening inequalities will require adequate investments in rural infrastructure (especially roads, transport, and communications), in human capital (education, specialized training, and health), and in social safety-net programs (see also the first part of this chapter).
MANAGING DEMOGRAPHIC TRANSITION

Demographic factors have played a major role in Asia’s growth in recent decades, and will continue to do so well into the next century. More importantly, demographic changes will continue to influence the quality of life in the coming years. For example, because of population aging and cultural shifts, traditional forms of caring for the elderly in rural Asia may be inadequate in the future. Policies that rely on family welfare systems are therefore unlikely to address future needs adequately, and policymakers must develop ways to create and fund rural pension systems before they are actually needed.

Rural Asia accounts for more than a third of the world’s total population and almost two thirds of Asia’s population. Even though rapid rates of urbanization are bringing down the rural-to-urban population ratio in Asia, rural populations will continue to grow in absolute terms. While Asia’s population is still increasing, the rate of growth is declining as fertility rates steadily fall. As fertility rates fall, the number of young children declines and the ratio of dependents to working-age people gradually decreases. Declining fertility also creates a bulge in the age pyramid, since the cohort just before the decline in fertility rates becomes the largest cohort, with each succeeding cohort having fewer numbers. When this large cohort reaches working age, dependency ratios will fall even further. As a result, per capita incomes will increase even without productivity increases, as long as the ratio of workers to dependents increases.

The economies of East Asia and, more recently, Southeast Asia have already reaped or are reaping the benefits of this “demographic gift”. The changing demography has contributed to the rapid rates of economic growth in East Asia, which had the earliest and most rapid demographic transition in Asia. Southeast Asia is now beginning to experience the economic growth impacts of its changing demography. South
Asia, where fertility declines have been the slowest, will gradually begin to experience the effects of the transition as well, although its impact will be weaker because of the more gradual demographic transition.

While Asia as a whole has experienced and will continue to experience this boost from the changing age structure, rural areas within Asia have been less successful at accomplishing the necessary demographic transition. Accelerating the transition in rural areas provides a way for countries to create a rural demographic gift, thereby enhancing both growth and quality of life in rural Asia.

In any country, a whole host of factors linked to the community’s social and economic environment influence the fertility rate. The importance of providing family planning services as part of a package of reproductive health services catering to clients’ needs has become increasingly apparent. More than just efficient family planning programs are necessary to lower fertility rates, however. Raising women’s education status and increasing their job opportunities have been most effective in bringing down fertility rates. Poor access to education and the lack of efficient labor markets for women in rural areas thus help explain higher rural fertility. Increasing educational opportunities for girls in rural areas can have long-term demographic benefits; creating job opportunities for women in rural areas will help raise the value of women’s time and thereby increase the costs of bearing more children. Since an important motivation for having children is to provide economic security for parents in their old age, providing a viable and efficient alternative in the form of pension plans and safety nets would reduce the dependence on children.

Initially, the impact of the demographic transition on both growth and the quality of life will be beneficial. The benefits, however, will be temporary. As the population ages, the bulge cohort will reach retirement age and old-age dependency will rise. This will start to have a negative impact on growth unless families and governments begin to prepare for it now. In Asia the family has been the main source of support for the elderly; this is particularly true in rural societies.
With smaller families and competing economic needs looming in the near future, investing in a better education for children is called for now so that they will be able to bear the financial burden of the future more easily. Demographic changes also mean that the elderly in rural Asia will require additional services, particularly medical services and the financial wherewithal to gain access to these services. Rural social welfare programs will be needed and rural societies will have to gear up to caring for the elderly.

Overall, demographic factors currently at work in rural Asia will have a powerful influence on several dimensions of future quality of life. Changes in fertility and migration patterns will be coupled with cultural changes associated with modernization, urbanization, and globalization. Demographic changes are predictable and thus provide decision makers with the opportunity to take them into account while designing policies that can responsibly address the far-reaching changes that the demographic transition is sure to bring. The challenge is to address these concerns now so that future problems are minimized.

MANAGING THE BIOTECHNOLOGY REVOLUTION IN AGRICULTURE

The unfolding biotechnology revolution in agriculture has the potential to dramatically transform agricultural production and processing in the future. Early benefits will be seen in modest yield increases, reduced dependence on agricultural chemicals for pest and weed control, increased drought resistance in crops, and better-quality and more nutritious food. This could be followed by much more significant breakthroughs in crop and livestock yields, new types of crops, control of major diseases in livestock, nitrogen fixation in cereals, and new types of processed foods. As with the microcomputer revolution of the 1980s, developments may accelerate much faster than the experts think.
If successfully tapped, the biotechnology revolution could make an extremely important contribution to future agricultural growth and food security in Asia. In fact, it may offer the only viable way of restoring adequate levels of growth in crop yields in the decades ahead. The green revolution has already run its course in much of Asia; yield growth for major food grains has become sluggish. It is seldom profitable for farmers to aim for more than 50 percent of yield potential as expressed in experimental-station yields; this level has already been reached in many irrigated areas. Conventional plant breeding is running out of options for providing the needed breakthroughs in yield potentials, but biotechnology is beginning to open up new sets of possibilities. Like many revolutionary developments, however, biotechnology also brings new risks and problems.

Most current agricultural biotechnology research is being undertaken by a handful of multinational companies and caters to the problems of rich farmers and developed-country consumers. Few outputs from this research will be appropriate for most Asian countries. For example, crop varieties with built-in herbicide resistance would require much greater reliance on herbicides than is common in Asia, where most weeding is still done by hand. Moreover, crop varieties that incorporate Bt genes for insect pest resistance need to be surrounded by buffer zones of non-Bt varieties if insects are not to become resistant. This may be hard to enforce in many Asian countries.

But the biggest limitation is that hardly any biotechnology research is being undertaken on many of Asia’s basic food crops or on the problems of small farmers. Even in Asian countries with the strength to develop biotechnology programs, such as India, research emphasis is often placed on export crops. The private sector is unlikely to change its focus because it perceives limited potential to reap profits from working on many of these problems. If Asian countries are to tap more fully into the biotechnology revolution, they will need to expand their own national and regional capacity to undertake some of this research.
Greater local capacity will also be essential for forming effective partnerships with relevant multinational companies and biotechnology research centers in developed countries. Several international initiatives are already attempting to improve Asia’s access to biotechnology research. For example, the Rockefeller Foundation launched its Rice Biotechnology Network in 1985 with the aim of improving national capacity. After a slow start, some of the International Agricultural Research Centers (e.g., The International Rice Research Institute and The International Crops Research Institute for the Semi-Arid Tropics) are also beginning to become more active players in biotechnology research. They may soon be able to serve an important intermediary role between multinational companies, developed-country research centers, and the needs and capacities of national agricultural research systems in Asia. These developments are at an early stage, however, and Asian countries need to make a much more concerted effort to tap into the biotechnology revolution. This will require allocation of additional public funds for agricultural research, as well as staffing up for biotechnology research.

The public sector will need to play a particularly important role in ensuring that small and disadvantaged farmers and resource-poor areas are not left further behind by the biotechnology revolution. Private companies have little incentive to work on the problems of these groups, since the latter are the least likely to be able to afford new and improved seeds or to use additional inputs like herbicides. Publicly funded (though not necessarily publicly conducted) research will be crucial for these groups.

Another worry for Asia is that biotechnology is being used in developed countries to genetically engineer substitutes for some of the region’s traditional export crops. This could eventually prove costly in terms of lost export earnings. For example, rapeseed plants with more than 35 percent laurate in their oil have now been produced in the US and are expected to provide a cheaper alternative to coconut and palm kernel oil. Such losses in competitive advantage will take place not only between developed and developing countries, but also
between smaller developing countries without biotechnology capacity and those developing countries that have it.

Biotechnology also brings new risks associated with the release of genetically modified material into the environment (e.g., gene jumping, new pests) and from the consumption of genetically modified foods (e.g., allergic reactions, toxins). These risks are not well understood and they provoke a great deal of anxiety among some segments of the public. National institutions must have the capacity to evaluate these risks and to implement and rigorously enforce appropriate regulatory systems.

Biotechnology is also associated with a thorny set of intellectual property rights issues. Property rights over genetic resources are needed to reward private companies for their efforts in developing improved varieties. But if these rights are inappropriately defined, they could lead some countries to lose ownership rights over their own indigenous genetic resources. These concerns have been reinforced in recent years by patents issued in the US for frivolous claims to turmeric, neem and basmati rice that essentially gave private companies ownership rights over underlying indigenous genetic material from Asia. Such patents are often overturned when challenged in US courts, but require costly litigation by Asian countries.

Another problem is that as more countries try to assert claims over their indigenous genetic resources (as agreed at the International Convention on Biodiversity), the free flow of agricultural genetic material between countries may be impeded. The high-yield varieties of cereal crops associated with the green revolution incorporated genes from a number of countries; these were freely exchanged through public research institutions to the benefit of all countries that could grow the crops. There is a growing danger that it will become increasingly difficult to share genetic material in this way and this could slow or impede future genetic improvements.

The development of an international system of intellectual property rights in agriculture is still in a state of flux, with the US taking an aggressive lead. Asian countries need to take a position that balances the interests of private-sector companies (both foreign and domestic) whose products
they would like to use with protection of their own rights of public access to indigenous genetic materials at home and abroad. This probably means they will need to implement patent laws to protect rights to novel and significantly improved genetic material. As far as possible, however, they should try to uphold the FAO’s 1984 International Undertaking on Plant Genetic Resources that states that these are a “common heritage of mankind”. There is enough commonality of interest so that Asian countries should work together and develop a common negotiating position on these issues.

MANAGING LAND AND WATER SCARCITY AND DEGRADATION

Finite quantities of land and water in Asia suitable for agriculture limit the scope for bringing new natural resources on line for food production. In addition, some contraction in land and water resources for agriculture, due to rising pressure to divert resources already in agriculture to nonagricultural uses, may partially offset any expansion. Moreover, environmental degradation of areas already in production can dampen growth in food supplies by eroding the productive capacity of the natural resource base; any new areas brought under production may be even more susceptible to degradation than are current areas.

Land degradation is a serious problem in both favorable and less favorable environments in Asia. On the one hand, intensification of agricultural production in irrigated and favorable rainfed environments, combined with sometimes flawed incentives due to inappropriate policies and weak enforcement of laws and regulations, has caused substantial environmental degradation. Meanwhile, in resource-poor areas, continuing population growth and a scarcity of good land have forced the expansion of cropped area into forested and woodland areas and onto steeper slopes, with increasing soil erosion. A third type of environmental degradation that
could expand dramatically is waste disposal and water quality problems caused by intensified livestock production.

Agricultural intensification *per se* is not the root cause of lowland resource-base degradation, but rather intensification combined with an inappropriate policy environment that has encouraged monoculture systems and excessive or unbalanced input use. Trade policies, output price policies, and input subsidies have all contributed to the unsustainable use of Asian lowlands. The dual goals of food self-sufficiency and sustainable resource management have often been mutually incompatible. Policies designed for achieving food self-sufficiency have undervalued goods not traded internationally, especially land and water resources, leading to salinity build-up, waterlogging, and nutrient mining. Subsidies have encouraged environmentally damaging misuse of inputs.

In the less favorable areas, mining of soil fertility, soil erosion, deforestation, and loss of biodiversity impose high costs on those who depend on these areas for a living. Soil erosion contributes not only to lower yields on site, but also to siltation problems downstream, reducing the capacity and productivity of reservoir and irrigation schemes and thereby affecting an even broader area. Likewise, deforestation in upper watershed regions can also have broader effects, for example by contributing to flooding problems in lowland areas. These problems are already serious in many “hot spot” areas in Asia such as the foothills of the Himalayas, sloping areas in the southern PRC and Southeast Asia, and the forest margins of Indonesia, Malaysia, Viet Nam, Cambodia, and the Lao People’s Democratic Republic (PDR).

With rapidly increasing demand for meat and livestock products in much of Asia, pressure on livestock production could cause similar or more severe environmental degradation in this sector. Fisheries production has also increased dramatically in response to increasing demand and this has led to severe strains on Asia’s aquatic resources (See Box 7). Modernization of the traditional livestock production systems in many Asian countries will require huge investments to
improve feeding potential, ensure a suitable animal environment, and provide other modern production and processing technology. As with intensive crop agriculture, however, the intensification of livestock production poses potentially severe environmental challenges. Production of livestock generates waste by-products that under some conditions can be recycled but, when animal concentrations are high, can become a serious pollution problem. Livestock and feed production use large quantities of water, not only as a direct input, but also for waste disposal. The high concentration of industrial livestock production has the potential to produce substantial organic discharges that are in excess of the carrying capacity of the surrounding environment.

Policies that mitigate or even reverse negative environmental effects in the crop sector and help preempt larger problems in the livestock sector include the removal of trade, macroeconomic, and price distortions in input and output markets and the establishment of price incentives or regulations to reduce the production of environmental externalities in both sectors. Establishment or improvement of secure property rights to land and water is also essential for improvement in the incentives for resource conservation. These environmental policy reforms in higher-potential areas for crop and livestock production must continue to receive attention, since Asia will continue to rely on these areas for its food production and degradation there poses a relatively greater threat to the food supply.

In the less favorable environments, it is the pressure to expand area under production, rather than intensification, that frequently causes degradation. In the short to medium term, intensification for these areas may be the best strategy, but because these areas are more fragile environmentally, intensification must be undertaken in a manner that preserves the environment. This will mean greater investment in technologies and policies suited to the diverse conditions that characterize low-potential areas, as well as efforts to link those areas to the broader economy so that the benefits of market reform reach them as well. As in high-potential areas, land
Box 7 – Increasing Pressure on Aquatic Resources

Fisheries production in Asia, both the capture and culture subsectors, grew remarkably in the two decades to 1996, at a faster pace (4–5 percent per year) than did Asian food crops (3.5–4 percent per year), and much faster than fisheries production in the rest of the world, which declined from 2.6 percent in 1977–1986 to only 0.3 percent in 1987–1996. Asia now accounts for more than half of the world’s total fisheries production. China has emerged as the dominant producer in both subsectors, with more than half of its total production coming from aquaculture.

At the global level, marine production exhibits a picture of general ill health. About 35 percent of the world’s major fisheries were showing declines by 1994; only about 40 percent could increase their production levels. The main causes are the open-access nature of most fisheries and subsidy-driven overcapitalization that have led to overfishing and excess fishing capacity, resulting in a global crisis in fisheries. Even increased production may hide deeper problems: increased squid production, for example, is attributable to declines in population of demersal fish, which are their predators. This trend of fishing down the food chain may have a long-term and perhaps irreversible impact on the ecological balance of marine ecosystems. Freshwater fisheries production worldwide is unlikely to increase significantly and faces increasing constraints from population pressure, mainly through pollution and inadequate access and user rights.

In Asia, overfishing has worsened during the last two decades. Catch rates in Thailand are down to only 6–10 percent of peak levels; catches of a number of large and small pelagic stocks (such as tuna and herrings, respectively) have declined,
while the proportion of juveniles of commercial species and of "trash" fish has been increasing.

In Asia, as elsewhere, there is a need to re-orient capture fisheries toward conservation and sustainability. Fisheries policies need to include not only production goals but also socioeconomic and ecosystem aspects and to take into account other users of coastal and inland aquatic resources. The dilemma policymakers face, between increasing production to meet growing demand and self-restraint and conservation, remains a difficult one to resolve, however.

Asia accounts for 90 percent of world aquaculture production, about two thirds of which is in fresh water and brackish water. The phenomenal growth of the culture subsector, nearly 12 percent per year in the decade 1987–1996, is likely to continue for some time, because there are still untapped potential areas, while new technology, such as genetic improvement and hatchery techniques, holds the promise of further gains. Some forms of aquaculture have had a severe negative environmental and socioeconomic impact, however: shrimp farming has entailed destruction of mangroves, water pollution, land dereliction, saltwater intrusion onto adjacent lands, and the introduction of exotic species and diseases in coastal waters. Inevitably, growth of both the freshwater and brackishwater culture subsector will be constrained by availability of and competition for suitable unpolluted water and by the environmental impact of culture operations themselves.


increasing, and within the next decade or two will approach crisis levels in many Asian countries, where there will simply not be enough water to meet everyone’s needs for all or part of the year. Growing water scarcity is resulting largely from rapidly growing demands for agricultural, industrial, and
household purposes, while the potential for expanding supplies is diminishing. There is much greater competition between urban and rural uses of water. Water-shortage problems are also aggravated by worsening environmental conditions related to deteriorating water quality, degradation of irrigated land, insufficient levels of river flow for environmental and navigation purposes, upstream land degradation, and seasonal flooding. Pollution of water from industrial waste, poorly treated sewage, and runoff of agricultural chemicals, combined with poor household and community sanitary conditions, is a major contributor to disease and malnutrition.

These problems are important throughout Asia: water scarcity is more of a seasonal constraint in the monsoon countries of East and Southeast Asia but a year-round problem elsewhere. Water-scarcity and -quality issues are especially severe in Central Asia (e.g., the Aral Sea) and parts of South Asia. In order to deal with these problems and to avert water scarcities that could depress agricultural production, cause rationing of water to household and industrial sectors, damage the environment, and escalate water-related health problems, new strategies for water development and management are urgently needed.

A large share of the water that is needed to meet new demand must come from water saved from existing uses through comprehensive changes in policies related to water and institutional reforms. Such changes will not be easy, because both long-standing practice and cultural and religious beliefs have treated water as a free good and because entrenched interests benefit from the existing system of subsidies and administered allocations of water. But it should be pointed out that the types of policies needed to improve water management are broadly applicable to other environmental problems as well. In the broadest sense, these are policies to improve the flexibility of resource allocation in agriculture:

- Removal of subsidies and taxes that distort incentives and encourage misuse of resources.
- Establishment of secure property rights and invest-
ments in research, education and training, and public infrastructure.
• Better integration of international commodity markets.
• A greater inclusion of populations in developing countries into these markets.

The most significant reforms will involve changing the institutional and legal environment in which water is supplied and used, to one that empowers water users to make their own decisions regarding use of the resource, while providing correct signals regarding the real scarcity value of water, including environmental externalities. The precise combination of new investments and water management reforms will vary depending on the location, level of institutional and economic development, and degree of water scarcity. But the key elements of the reform include

• holistic water management at the river basin level;
• user-managed irrigation;
• water use rights, pricing, and markets; and
• groundwater management.

Each of these is discussed further below.

**River Basin Management**

The watershed, or river basin, is the hydrologic unit that includes the key interrelationships and interdependencies of concern for water management, as represented, for example, in the linkages between upstream and downstream water users. Competition for limited water resources occurs between different stakeholders/sectors and at different levels: among farmers within an irrigation system; between irrigation systems in the same river basin; between the agricultural sector and other rural uses, such as fisheries or domestic water supply; and more and more often between agricultural and urban and
industrial users and uses. Environmental uses also enter the competition. Upland watersheds are source areas for surface and groundwater recharge, while downstream agriculture and urban development are directly dependent on water supplies from the upper watershed.

In many regions, poor management of watersheds through deforestation, the eradication of perennials, and other human interventions in upland areas can lead to soil erosion and decreases in agricultural productivity; siltation of reservoirs and irrigation systems; adverse impacts on fisheries, wildlife, river habitat, and recreational water uses; water pollution; flooding of lowland areas; and reductions in water supply for irrigated agriculture, hydropower, industrial, and urban uses. The factors shaping the competition for water use at the river basin scale include economic and population growth; changes in technologies and the environment (including climate change); changes in the social, legal, institutional, and political environment; and changes in the physical, technical, and economic environment.

Because of these complex interrelationships, integrated water management at the river basin level is the foundation for the sustainable management of water resources. The main roles of the public sector in water management are

- to define and implement a strategy for managing water resources that includes stakeholder participation;
- to provide an appropriate legal, regulatory, and administrative framework;
- to guide intersectoral allocations; and
- to develop water resources in the public domain.

It is at the river basin level that water allocation decisions must be made across the major competing demands of agricultural, municipal, and industrial users. Investments and allocation decisions in one part of the basin affect activities in other parts of the basin. As a result, policy instruments designed to make more rational economic use of water resources need to be applied at this level. Improved water management at
the river basin level will require considerable strengthening of relevant public institutions and improved tools for planning and monitoring purposes.

**User-Managed Irrigation**

In many countries, poor performance of agency-managed systems, together with fiscal pressures from mounting operations and maintenance costs, has provided a major stimulus for transferring management responsibility for both irrigation and domestic water-supply systems from agencies to user groups. In the Philippines, inadequate local funding, exacerbated by shrinking donor-agency contributions and declining revenues due to farmers’ failure to pay irrigation fees, prompted the national government to transfer system management to the farmers. This management transfer program initially focused on small-scale systems with traditions of strong farmer involvement and later expanded to larger-scale public systems.

A major advantage of the user allocation strategy is its potential flexibility to adapt water delivery patterns to meet local needs. Having more information on local conditions than agency staff, those directly involved in a sector’s water use do not have to rely on rigid allocation formulas. For example, based on the soils’ water-retention capacity, certain fields may be given more water than others. User organizations may also consider local needs for watering animals, bathing, washing clothes, or various small enterprises, needs that a sectoral agency has no mandate to meet. The result can be improvements in either output per unit of water or in equity or both.

User-based institutions can be constituted as irrigation districts, groundwater districts, cooperatives, irrigator associations, village-based organizations, or more informally constituted user groups. Studies of such farmer-managed irrigation systems have shown a wide diversity of rules for within-system allocation: by timed rotation, water depth, land
area, or shares of the flow. In the domestic water-supply sector, user-based allocation is seen in community wells and hand-pump systems, as well as in a growing number of more sophisticated systems controlled by water and sanitation associations.

Among a wide range of factors affecting the viability of organizations for water management, property rights are a critical factor. In the past, system turnover of infrastructure and management of systems has often failed because of flaws in internal structural features or external factors that affect the viability and sustainability of water-user associations in managing irrigation systems. The cohesive force of property is important in many aspects of water management, but is especially critical for allocation. User groups cannot make decisions regarding water if they have no de jure or de facto rights over the resource. Property rights, which can be ownership of the actual irrigation facilities and/or water rights, form the basis for relationships among irrigators, which become the social basis for collective action by irrigators in performing various irrigation tasks.

Water user groups also tend to be stronger if they build upon existing social capital or patterns of cooperation. Groups are likely to be stronger if they are homogeneous in background and assets (though heterogeneity can be managed). User groups must have a demonstrable effect in improving water control and farm profitability to ensure that the benefits to farmers outweigh the costs of participation. Particularly crucial to success is a supportive policy and legal environment that includes establishment and adjudication of secure water rights, the monitoring and regulating of externalities and third-party effects of irrigation, and the provision of technical and organizational training and support.

**Water-Use Rights, Pricing and Markets**

Irrigation water in nearly all of Asia has been subsidized and in many cases provided free. Farmers therefore have little
incentive to economize on its use. Two major environmental problems in intensified areas—land degradation due to salinity buildup and waterlogging and the buildup of increasingly resistant pests due to excessive reliance on monoculture rice—are directly related to the virtually free provision of water to farmers. Increasing water-use efficiency through opportunity-cost pricing or market valuation of water would have substantial environmental benefits and would not adversely affect yields; yet this leverage for improving the sustainability of the resource base has rarely been utilized in Asia.

In principle, markets in tradable water rights may have considerable efficiency and other advantages over other allocation mechanisms. These include

- empowerment of water users by requiring their consent to any water reallocation and compensation for any water transferred;
- security of water rights tenure to users, which can encourage investment in water-saving technology;
- provision of incentives for users to consider the full opportunity cost of water when making allocation decisions, including its value in alternative uses; and
- provision of incentives for water users to account for external costs imposed by their use, reducing the pressure to degrade resources.

Water markets could, therefore, play a key role in reducing environmental degradation by providing incentives for water conservation.

Despite these potential benefits, constraints to broad-based water market approaches are significant in most of Asia. The unique physical, technological, and economic characteristics of water resources pose special problems for establishing tradable water rights and developing markets for such rights. Because of both environmental concerns and larger public interests, regulatory mechanisms for large-scale water use would have to be carefully designed. The fundamental importance of water to farm production and income raises
serious equity concerns when major shifts in water allocation are considered. Multiple reuse of water creates the likelihood of significant third-party externalities, that is, spillover effects on other people’s welfare from water trades, creating further difficulties in enforcing and regulating trade in water. Moreover, surface irrigation in much of Asia consists of very large systems serving many small farmers. Development of water markets at the farm level under these conditions would be difficult, because measurement of deliveries to large numbers of end users, in order to charge by volume of water use, requires a combination of technology and monitoring effort that is not cost-effective under these conditions.

Because of these complexities, establishment of markets in tradable water rights is likely to be a longer-term solution in much of Asia, will be more extensive for groundwater irrigation, and for surface-water irrigation systems will be concentrated (at least initially) around major urban areas. But market-type incentives in water allocation could be strengthened through innovative approaches that would combine the benefits of water markets and user management. Although appropriate institutions would need to be designed for specific countries and regions, the wholesaling of relatively large blocks of water to user groups or privately run irrigation subunits could establish appropriate incentives for water allocation. The user group would then be responsible for internal allocation of the water, and could resell water that was saved through efficient use. The price charged for water under this allocation method would have to be high enough to improve cost recovery for irrigation and to encourage conservation of water. Water prices can also include pollution or effluent charges in order to reduce the incentive to pollute.

Groundwater Management

Sustainable development of groundwater resources also offers significant opportunities for many countries. The massive expansion of private-sector tubewell irrigation in India,
Pakistan, and Bangladesh is the most successful example of private-sector irrigation development in the developing world. Private tubewells have grown most rapidly in areas where there are reasonably good roads, where research and extension systems operate, and where credit and electric or diesel energy are accessible. Private tubewells have largely developed in and around the command areas of large surface-irrigation systems, because deep percolation losses from the surface systems recharge the aquifers for tubewells.

Principles for groundwater management reform are similar to those for surface water, including the introduction of economic incentives and user involvement in the allocation process. Successful approaches in the western United States appear surprisingly appropriate for conditions in much of Asia. The approaches have employed a variety of instruments to influence water demand, including pumping quotas (usually based on historical use), pumping charges, and transferable rights to groundwater. The governance structure in the water basin (shared aquifer) establishes water rights, monitoring processes, means for sanctioning violations, representative associations of water users, financing mechanisms for administration and management, and procedures for adapting to changing conditions. Key elements for the success of this governance structure are that it is agreed upon and managed by the water users; that it is responsive to local conditions; that it operates with available information and databases, rather than requiring theoretically better but unavailable information; and that it adapts to the evolving environment.

Effective and sustainable management of groundwater will also require that policy distortions in other sectors that impinge on groundwater use are corrected. Subsidies to diesel fuel and electricity used for pumping and subsidized credit for purchasing pumps and engines, which have been prevalent in parts of South Asia, can encourage the wasteful use of groundwater and aggravate problems with declining water tables.
BUILDING GOOD GOVERNANCE AND SOCIAL CAPITAL

Asian societies are changing. With rising incomes and globalization, there is increasing demand for more competitive politics and greater popular participation in government. There is increasing demand for more democratic forms of governance and for greater devolution of the management of public resources to local governments and organizations. Greater participation is an important contributing factor to the quality of life (See Figure 3, p. 41).

The demand for improved governance is also driven by some of the failures of the past. The Asian financial crisis, for instance, has exposed serious weaknesses in financial and corporate oversight and pervasive corruption in high places. People not only want a greater say in public decisions, but also more accountability in the way funds are spent. These changing expectations about governance have led to an increase in political activity, an increasing visibility for organized civil society, and an increasing importance for NGOs.

At the same time, the nature of many public goods is changing, as are the options for supplying them. As biotechnology becomes more important, for example, more aspects of agricultural research are being privatized and this requires some rethinking about the role of publicly provided agricultural research. The removal of parastatals and the privatization of agricultural marketing and service provision have also reconfigured the role of the public sector to one of regulation rather than supply. In the case of education and health care, both directly related to the quality of life, household demand for services increases rapidly with income and the private-sector response in provision is already very apparent in Asia’s urban areas. There is need to reconfigure the roles of the public and private sectors and of civil society in providing many public goods and services so as to make them more cost-effective and efficient and to better meet the changing needs of rural people. In the case of merit goods
such as education, basic health care, and water supply, a public-sector role in provision will have to be maintained for bypassed regions and the rural poor, whose limited consumer wherewithal prevents a satisfactory private-sector response.

Good Governance

Good governance embraces the concepts that authority is based on the rule of law, that its policies are transparent, that it is accountable to society, and that it is based on institutions and not on individuals. Institutional reform to provide good governance is a complex and long-term process that requires both improvement in public administration and public-sector management and movement toward more diversified delivery of services that is responsive to stakeholders. Public-sector management should be improved to enhance transparency and accountability, improve efficiency and effectiveness, and reduce opportunities for corruption. Management information systems, audit functions, and procurement systems should be upgraded to strengthen the capacity of governments to monitor expenditures; ensure control over disbursements; and reduce costs, fraud, and abuse. Pay increases and improvement in employment conditions for civil servants could reduce the incentives for illicit behavior. Improved procedures for recruitment and promotion could help avoid the abuses of patronage, nepotism, and favoritism and help foster the creation of an independent, meritocratic civil service.

Fundamental reform of the relationship between the public sector and the recipients of public-sector services is also necessary. A diversified approach to delivery of services that would involve government, the private sector, civil society, and religious institutions can help reduce the risks of relying on only one delivery channel.

To diversify delivery successfully, it is important also to reform the “demand side” for services. Generation of effective demand for public services and monitoring of public-sector performance is enhanced by a pluralistic society with rights
to associate and to organize interest groups that have access to information about government services and programs.

Governments would reduce implementation problems and enhance public support for their programs by easing access to information and allowing affected communities the opportunity to voice their concerns. Decentralization of services to local or community-based institutions can be an important component of good governance, but should not be seen as a panacea: local elites may have weaker rather than stronger technical resources at their disposal and greater opportunities for corruption and lack of transparency.

NGOs can play an important role in good-governance reforms on both the supply and the demand side. Traditionally, NGO activity has concentrated on the supply side: delivering services or assisting the public sector in operating its programs. But NGOs are increasingly becoming involved in the demand side: helping communities articulate their concerns and preferences, negotiating with official bodies in order to amplify the community “voice,” and mixing technical operational skills with information-intensive communication, advocacy, and networking to enhance the influence of poor people.

Effective NGOs can improve governance in several ways:

- by encouraging government ministries to adopt successful approaches developed within the voluntary sector;
- by educating and sensitizing the public about their rights and entitlements under public programs;
- by acting as a conduit to the government for public opinion and local experience;
- by collaborating with official bodies;
- by influencing local development policies of national and international institutions; and
- by helping government and donors fashion a more effective development strategy through strengthening institutions, carrying out staff training, and improving management capacity.
NGO involvement may not always be a positive force for good governance, however. Some NGOs and governments have long histories of mutual mistrust. If an NGO operates according to predetermined principles coupled with preset plans of action, it could both overlook the real needs and desires of local communities and alienate local and national government agencies. In addition, if NGOs act in isolation, setting up their own fiefdoms, good governance can be hindered rather than encouraged.

Changing Roles

In the current enthusiasm for market liberalization, privatization, and the increased participation of civil society, it has become fashionable to think that the smaller the role of the public sector the better; as a result budgets for many key public-sector services have been cut to critical levels. Central planning is rightly dead, but countries still need organized and rational approaches to the provision of key public goods and services in rural areas. The private sector has insufficient incentive to provide many rural infrastructure and social services (e.g., roads, irrigation, electricity, communications, clean drinking water, schools, health centers and hospitals), or to undertake much of the needed agricultural research (particularly for poorer farmers and regions), because it cannot find ways to charge for, and hence capture, a sufficient amount of the benefits that these investments generate. Nor does the private sector have any incentive to regulate itself to ensure efficient and competitive markets, to ensure the safety of the public, or to correct environmental externality problems.

Government has a crucial role to play in providing these kinds of public goods and services. However, the role of government in financing public goods and services needs to be distinguished from its role in supplying them. There are increasing opportunities in Asian countries for governments to contract out the provision of many public goods and services to private firms and NGOs. This can often lead to greater
efficiencies, cost savings, and improved accountability to end-users.

The innovative institutional and policy reforms required for water management that were described in the previous section show the complex blending of public sector, market, and civil society that can lead to improved performance. Another example of such synergistic cooperation can be seen in the area of agricultural research. It is likely that the share of private investment in agriculture will increase in the future, but the public role remains essential; decentralization of research and dissemination of the technology generated by research would be highly beneficial. A number of developments could increase the role of the private sector in agricultural research in Asia. The private sector’s ability to capture the benefits of research results has increased, now that hybrids are being increasingly used and policy barriers to private-sector involvement are being reduced. Biotechnology innovations are likely to further the scope for private-sector involvement. In several countries the private seed sector has emerged as the dominant supplier of finished varieties for a number of crops. Policies to further increase private-sector involvement require continued attention; while many research activities require the long-term continuity of a public or semipublic institution, the potential for contracting for research should be explored more vigorously.

Private-sector research, however, has generally shown little interest in solving the critical issues involved in increasing basic yield potentials in wheat or rice varieties adapted to Asian agroclimatic zones or in developing hybridization procedures for additional crops. Moreover, there are some “orphan” commodities, mostly tropical crops, fruits and vegetables, where the private sector makes no investments. Contracting entire long-term research agendas to the private sector is therefore probably impossible, and a significant and sustained public role in funding agricultural research will be necessary.

The growing complexity and agroclimatic specificity of agricultural technology suggests also that the division of responsibilities and working relationships among international,
national, and subnational research centers needs to be reexamined with a view to increased efficiency. Decentralization of research regionally and to the farm level, based on agroecological characterization, may be the most effective approach, because it provides better farmer input and feedback to upstream researchers and policymakers. Improvement in linkages between public agricultural research and small research firms and informal farmer research could have high payoffs. Farm-based research often specializes in choosing varieties that are specific to microenvironments and can be highly complementary with formal research systems.

Similar opportunities exist to out-source, privatize and decentralize parts of the supply of many other public goods and services, including agricultural extension, foodgrain and fertilizer distribution, education, and health. In all cases, governments need to proceed with a clear understanding of the comparative advantages and strengths of the different actors to be involved and with agreement on methods for financing their implementation, monitoring their performance, and ensuring their accountability.

Rural social services deserve specific mention because of their importance as quality-of-life indicators. There is a fundamental "urban bias" in the provision of these goods by both the public and private sectors. The per capita cost of provision is much lower among concentrated urban populations. With traditional public-sector-dominated provision, the rural areas have suffered through the inadequacy of accessibility, quality, financing, and management of social services. But while private provision of education and health care has often grown explosively in urban areas because of the rapid growth of household income and demand, this has not occurred in rural areas, where incomes are lower and delivery costs are higher. The result is that the natural substitution of private- and public-sector roles that is evident in urban areas has yet to emerge as strongly in the countryside. Governments therefore should consider the extent and likelihood of persistence of urban bias when decisions are made about the allocation of scarce public resources between urban and rural areas.
The role of government is changing. While it was seen in the 1960s as the main provider for society’s needs, changing conditions, both domestically and internationally, have revealed its limitations and there is better understanding of what governments can and cannot do effectively. Government financing capacity is increasingly constrained. The private sector, local governments, communities, and NGOs have emerged as important partners in rural development. The challenge for Asian governments during the next century will be to manage their own transition from direct providers of goods and services to facilitators and regulators of private and civil-society activity. This will require responsible, flexible institutions and governance structures that encourage growth and at the same time ensure that private actors perform with public and social interest in mind.
While the agriculture sector has declined relative to other sectors of the economy as the economic transformation in much of Asia has taken place, it continues to grow—and must continue to do so if countries are to meet their food needs into the 21st century. Agricultural growth also underpins much of the growth and employment in the rural nonfarm sector. If agricultural growth were to slow down, this could jeopardize national food security and increase child malnutrition in many countries, cause significant new unemployment and poverty (particularly in agriculture and the rural nonfarm economy), and slow nonagricultural growth.

Some of the future consequences of neglect of agriculture can be demonstrated with simulated results from the IMPACT (International Model for Policy Analysis of Agricultural Commodities and Trade) model of the global food sector created by the International Food Policy Research Institute. The model was used to compare projections to year 2010 if a) governments become more complacent than they are today about agriculture, cut back further on their rural and agricultural investments, and don’t make needed policy reforms (a “low-investment, weak-reform” agenda), or if b) governments give greater importance to agriculture and rural areas, invest more, and accelerate the needed policy reforms.
(a “high-investment, strong-reform” agenda). Results are compared to a baseline scenario that assumes that there will be no significant policy changes from the present: a “business-as-usual” agenda.

To contrast the two scenarios, model simulations were specified involving symmetric and contrasting changes in key model parameters from the baseline. These relate to assumptions about the growth rate for nonagricultural GDP (plus or minus 25 percent); public investment in agricultural research and in health, education, and sanitation (plus or minus 10 percent); population growth (high versus low United Nations estimates); rates of soil erosion (plus or minus 0.05 percent); growth in irrigated area (zero or plus 5 percent by 2010); and agricultural water use (plus or minus 10 percent by 2010). It is important to note that these changes from the baseline are really quite modest and represent relatively small changes in the amounts of public investment in agriculture and the rural sector. These parameter changes are summarized in Table 3.

Table 3. Alternative Policy Scenarios

<table>
<thead>
<tr>
<th>Change, 1999–2010, vis-à-vis baseline</th>
<th>Low Investment Weak Reform</th>
<th>High Investment Strong Reform</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-ag GDP growth</td>
<td>−25%</td>
<td>+25%</td>
</tr>
<tr>
<td>Public investment in agricultural research</td>
<td>−10%</td>
<td>+10%</td>
</tr>
<tr>
<td>Public investment in health, education, sanitation</td>
<td>−10%</td>
<td>+10%</td>
</tr>
<tr>
<td>Population growth scenario</td>
<td>UN ‘high’</td>
<td>UN ‘low’</td>
</tr>
<tr>
<td>Rate of soil degradation-yield effect</td>
<td>−0.05%</td>
<td>+0.05%</td>
</tr>
<tr>
<td>Irrigated area</td>
<td>No growth</td>
<td>+ 5%</td>
</tr>
<tr>
<td>Agricultural water use</td>
<td>−10%</td>
<td>+10%</td>
</tr>
</tbody>
</table>

Because Asia plays a major role in world food markets, neglect of the agricultural sector leads to significant increases in the world and Asian prices of basic foods (by 20–30 percent for cereals, 30–60 percent for roots and tubers, and 5–8 percent
for livestock products). This in turn leads to a decline of 3 percent in the per capita availability of food in Asia compared to the baseline results (Table 4). On the other hand, the more optimistic scenario leads to significant world and Asian price declines (16–27 percent for cereals, 25–40 percent for roots and tubers, and 4–7 percent for livestock products) and a 4-percent increase in the per capita availability of food.

Table 4. Per Capita Food Availability Under Different Policy Scenarios (Kilocalories per day)

<table>
<thead>
<tr>
<th>Region</th>
<th>1993</th>
<th>2010 Baseline</th>
<th>Low Investment/ Weak Reform</th>
<th>High Investment/ Strong Reform</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developing Asia</td>
<td>2,488</td>
<td>2,734</td>
<td>2,646</td>
<td>2,842</td>
</tr>
<tr>
<td>PRC</td>
<td>2,680</td>
<td>3,008</td>
<td>2,913</td>
<td>3,096</td>
</tr>
<tr>
<td>South Asia</td>
<td>2,370</td>
<td>2,599</td>
<td>2,510</td>
<td>2,719</td>
</tr>
<tr>
<td>India</td>
<td>2,397</td>
<td>2,644</td>
<td>2,559</td>
<td>2,764</td>
</tr>
<tr>
<td>Southeast Asia</td>
<td>2,525</td>
<td>2,707</td>
<td>2,626</td>
<td>2,838</td>
</tr>
</tbody>
</table>

The difference between the pessimistic and optimistic scenarios is best exemplified by the predicted number of malnourished children in 2010. This number is a good indicator of many other measures of poverty and deprivation. It is also a good lead indicator of future poverty because childhood malnutrition impairs mental and physical capacities for life. Under the baseline assumptions, there will be 113 million malnourished children in developing Asia by 2010, down from 140 million in 1993 (Figure 4). The number declines to 76 million under the more optimistic scenario, but increases to 141 million under the more pessimistic scenario—a difference of 65 million malnourished children. The differences are particularly important for India and the rest of South Asia, where complacency would leave large numbers of children malnourished.

The key point from these results is that it does not take much backsliding by governments to lead to unacceptable outcomes within a decade. There is no room for present or
future complacency. Even a business-as-usual approach will still leave an intolerable number of malnourished children in 2010. On the other hand, it only takes a relatively modest increase in government commitment to agriculture and rural development to lead to a much more favorable situation by 2010.
A VISION FOR COMPLETING THE RURAL TRANSFORMATION

All the above scenarios leave very large numbers of people in poverty and between 76 and 141 million malnourished children in 2010. The levels of projected deprivation are particularly onerous in South Asia. If just a modest increase in government commitment to rural investment and policy reform could save tens of millions of children from malnutrition in the years ahead, then what would it take to eradicate poverty and child malnutrition entirely by the year 2020?

IFPRI’s IMPACT model was used to obtain an approximate answer to this question. The results show that there are development pathways that could eradicate virtually all child malnutrition in Asia by 2020, with only 45 million malnourished children remaining by 2010 and 8 million by 2020 (Figure 5). However, to achieve these reductions, most Asian economies would have to grow at rates close to the peaks experienced by Asia’s most dynamic economies in recent decades (8–10 percent per annum), and projected agricultural output would have to increase by 75 percent in South Asia and by 50 percent in East and Southeast Asia. Among other things, this would require that cereal yields grow at 1.45 percent per year in East Asia, at 1.90 percent per year in Southeast Asia, and at 2.44 percent per year in South Asia. Even if world markets could accommodate this level of economic expansion in Asia, it would also require that Asian governments undertake significant new investments in agriculture and rural areas and a 50-percent increase in social spending.

This analysis suggests that child malnutrition could reasonably be eradicated in the PRC and Southeast Asia within the next two decades, but for South Asia, more realistic strategies will need to take a much longer view. This has the added advantage that it would permit population policies and demographic trends to play a more effective role, as it was suggested they would in Chapter III’s description of the
### Figure 5  Eliminating Malnutrition: Number of Malnourished Children, 0–5 years of age, millions

"demographic gift" that will be presented to developing Asia in the next 20 years. Population growth had to be taken as given within the time span of the model simulations.
On the threshold of the 21st century, Asia stands, if not at a crossroads, then at a point of decision. Unprecedented rates of rural and national economic growth have transformed many parts of rural Asia, but not all developing Asia shared in this transformation.

In the face of this challenge, the completion of the rural transformation of Asia will take renewed efforts on the part of governments. Successful economies must not turn away from their market orientation, but rather support the private-sector role where that is possible and supplement it where it is not. Meeting the challenge must also involve a renewal of governance itself: transparency, responsiveness, and eradication of corruption are all keys to sustained growth in the next century.

Governments will also have to increase the level of productive investment made in rural infrastructure, agricultural research and extension, education, and health, as well as expand the reach of social safety-net programs. A significant part of these costs could be met in some countries by reducing wasteful public expenditure in rural areas, particularly on subsidies for credit, fertilizers, pesticides, electricity, and irrigation water. These subsidies may have played an important role in launching the green revolution, but today they are rarely needed and can be counterproductive, because they create incentives for the overuse of water and farm chemicals, leading to environmental degradation. There is also considerable scope for “getting more with less” by improving the efficiency of many of the public institutions that implement public investments. This again requires changes in

V CONCLUSIONS AND RECOMMENDATIONS
governance structures, with increased transparency and accountability to key stakeholders and greater roles for the private sector, user groups, and NGOs where they can better provide the required services. There is also scope for raising more revenues from rural people through user fees and local taxation and for cofinancing through lotteries and the sale of savings bonds. These kinds of changes might provide much of the financing needed for rural areas in the future, but they will take time to implement. If poverty and malnutrition are to be meaningfully reduced within the next generation, additional allocation of central government funds will almost certainly be required, at least in the immediate future.

Rural development strategies must aim at achieving multiple objectives. While the primary concern is poverty reduction and improving the quality of life of the rural population, the strategies that will lead to these outcomes (“win-win-win strategies”) must be broad-based and far-reaching. Some of the main elements of the strategies, recommended by the study, include the following:

- Maintaining sufficient levels of public investments in agricultural research, rural infrastructure, education, and health so as not to jeopardize the future.
- Reducing or eliminating wasteful public expenditure on subsidies that are either biased against rural areas generally or tend to help mainly better-off rural residents.
- Adopting rationalized agricultural pricing policies that aim at providing stability to reduce risk but that do not discriminate against rural producers for the benefit of urban consumers.
- Undertaking major institutional reforms, including improvements in management and administration of public institutions, increased transparency and accountability of public-sector activities, movement toward more diversified delivery of services, and the prudential regulation of financial institutions and corporations.
• Creating effective safety nets to protect vulnerable people during crisis times and to prepare for the longer-term effects of the changing age structure.
• Adopting taxation and interest-rate policies that are conducive to long-term investments but discourage the kinds of short-term capital flows that aggravated the effects of the 1997 financial and economic crisis.
• Investing more in agricultural research, especially biotechnology, since most present activity in this field is conducted by multinational companies and neglects Asia’s crops and problems.
• Managing natural resources holistically, e.g., water management at the river basin level, user-managed irrigation, and establishment of water-use rights, pricing, and markets, to anticipate and cope with impending problems of scarcity.
• Facilitating effective roles for NGOs and civil society in carrying out good-governance reforms, on both the supply and demand sides.

While the specter of famine that threatened Asia in the 1960s has not returned in the 1990s, widespread poverty and malnutrition still coexist with great wealth. Completion of the rural transformation, radical reduction in poverty, and improvement in food security in Asia hang in the balance. They are attainable, if complacency is resisted.
APPENDIX 1
RURAL ASIA STUDY: BACKGROUND

The Study was designed as a team effort utilizing ADB staff and international experts. The Study was implemented under the guidance of an ADB interdepartmental steering committee comprising several heads of departments, with overall responsibility lying with the Agriculture and Social Sectors Departments (East and West regions).

To address the diverse issues satisfactorily and in a comprehensive manner, five thematic subject areas were identified to provide the analytical and empirical background on which the Study’s recommendations would be based. Working groups comprising ADB staff were set up to broadly define the scope and coverage of each of the themes. The five working groups acted as counterparts to the international experts recruited to prepare the background reports, providing guidance to the experts and reviewing their output. The background reports prepared under the Study and the experts responsible are as follows:

*Transforming the Rural Asian Economy: The Unfinished Revolution*
Mark W. Rosegrant
Peter B. R. Hazell
International Food Policy Research Institute

*The Growth and Sustainability of Agriculture in Asia*
Mingsarn Santikarn Kaosa-ard
Benjavan Rerkasem
Chiangmai University
With contributions by
Shelley Grasty
Sunil S. Pednekar
Paul Auger
Thailand Development Research Institute Foundation
Apichart Kaosa-ard
Kanok Rerkasem
Chiangmai University

*Rural Financial Markets in Asia: Paradigms, Policies, and Performance*
Richard Meyer
Geetha Nagarajan
Ohio State University

*The Quality of Life in Rural Asia*
David Bloom
Patricia Craig
Pia Malaney
Harvard Institute for International Development

*The Evolving Roles of the State, Private, and Local Actors in Rural Asia*
Ammar Siamwalla, Thailand Development Research Institute
With contributions by
Alex Brilliantes, University of the Philippines
Somsak Chunharas, Health Systems Research Institute, Thailand
Colin MacAndrews, Associates in Rural Development, USA
Andrew MacIntyre, University of California, San Diego
Frederick C. Roche, Asian Development Bank

A panel of external advisers was constituted to review and comment on the approach and methodology of the study and the terms of reference for each of background reports.
The external advisers also reviewed the drafts of the background reports. The external advisers to the Study were

A. Z. M. Obaidullah Khan  
Bangladesh Centre for Advanced Studies

Klaus Lampe  
Former Director General, International Rice Research Institute

Justin Yifu Lin  
China Center for Economic Research, Peking University

Meryl Williams  
International Center for Living Aquatic Resource Management

In addition, external reviewers were appointed, including prominent members of academe and senior policymakers, to review each of the background reports and to provide expert guidance. The external reviewers were

**Report 1:** Walter Falcon, Stanford University  
Saeed Ahmed Qureshi, former Secretary of Finance, Government of Pakistan

**Report 2**  
M. S. Swaminathan, former Director General, International Rice Research Institute  
Yujiro Hayami, Aoyama-Gakuin University, Japan  
Rattan Lal, Ohio State University

**Report 3**  
J. D. Von Pischke, formerly with the World Bank  
Nimal Sanderatne, National Development Bank, Sri Lanka

**Report 4**  
Frances Stewart, University of Oxford.
Report 5  Ha-Joon Chang, University of Cambridge
     Yoginder Alagh, Member of Parliament, India

The preparation of the background reports included four workshops held at ADB’s headquarters in Manila. An inception workshop in May 1998 initiated the work on the background reports. The international experts and the working groups presented the outline of each background report. These were commented on by the external advisers and discussed by members of the interdepartmental steering committee and other ADB staff before being finalized.

The first drafts of the theme papers and comments received from the external reviewers were discussed at a midterm workshop in November 1998. At the workshop the working groups discussed in detail with the experts all the comments received and made suggestions for improvements to the papers, in terms of analytical content, connecting themes, policy recommendations, etc. In addition, a detailed timetable was prepared for the completion of the papers.

An interim workshop was held in January 1999 to discuss the revised drafts of the reports and to ensure that all comments received had been adequately reflected in the revisions. The workshop also initiated discussion on the structure and content of an overview report that would bring together the major findings, policy recommendations, and lessons learned from each of the background reports. The main messages from the background reports would be synthesized into a set of policy recommendations and strategic priorities and challenges facing ADB’s developing member countries.

At a final workshop in March 1999, the background reports were presented by the international experts to a large group of participants comprising senior policymakers from ADB’s developing member countries, international organizations, international and locally based nongovernment organizations, donor agencies, and members of academe, along with ADB staff. The five background reports were edited by John Maclean and Sara C. Medina and submitted to Oxford University Press for publication.
Following the workshop, the experts, the working groups, and the heads of the Agriculture and Social Sectors departments intensively discussed the major issues and policy recommendations that would be included in the overview report and agreed upon an outline and structure for the paper. Based on this discussion and outline, Peter P. R. Hazell and Mark W. Rosegrant prepared the first draft of the overview report, which was reviewed by ADB staff.

The draft overview report was presented at a seminar at the Bank’s 32nd Annual Meeting. The seminar provided an opportunity for rural development experts to discuss and exchange ideas on appropriate rural development strategies and policy options for ADB’s developing member countries. Based on the comments received and the discussion during the seminar, the overview report was revised. Various revisions were suggested by members of the working groups to ensure that each of the themes’ main messages has been adequately reflected in the overview.

Finally, the overview report was reviewed by ADB staff and revised by Shahid N. Zahid, project officer for the Study, to reflect all the views and comments received. The report was edited by Sara C. Medina and readied for publication.

**RURAL ASIA STUDY: ASSOCIATED BANK STAFF**

**Rural Asia Secretariat**

**Core Group**
Yang Weimian, (Co-Chair), Director, Agriculture and Social Sectors Department, East
Akira Seki, (Co-Chair), Director, Agriculture and Social Sectors Department, West
(Note: replaced Eustace Nonis, Former Director, Agriculture and Social Sectors Department, West)
Hans-Juergen Springer, Deputy Director, Agriculture and Social Sectors Department, East
M. E. Tusneem, Deputy Director, Agriculture and Social Sectors Department, West
Bradford Philips, (Project Manager), Manager, Agriculture & Rural Development Division, East
Shahid N. Zahid, (Project Officer), Senior Sector Specialist, Agriculture and Social Sectors Department, East
Arjun Thapan, Senior Project Specialist, Agriculture and Social Sectors Department, West
Frederick Roche, Senior Project Economist, Forestry and Natural Resources Division, East
William Ferguson, Senior Executive Officer, Agriculture and Social Sectors Department, West

Staff
Cristina M. Gamboa, Senior Operations Analyst
Elizabeth S. Tan, Economist
Laura S. Britt, Economist
Lilibeth C. Perez, Administrative Assistant

Interdepartmental Steering Committee
Yang Weimin, (Co-Chair), Director, Agriculture and Social Sectors Department, East
Akira Seki, (Co-Chair), Director, Agriculture and Social Sectors Department, West
Shoji Nishimoto, Director, Programs Department, East
Geert Van der Linden, Director, Programs Department, West
Vladimir Bohun, Director, Infrastructure, Energy and Financial Sectors Department, East
Christine Wallich, Director, Infrastructure, Energy and Financial Sectors Department, West
A. Timothy Peterson, Director, Operations Evaluation Office
Basudev Dahal, Director, Office of Pacific Operations
Kazi F. Jalal, Chief, Office of Environment and Social Development
Yoshihiro Iwasaki, Chief, Strategy and Policy Office
Jungsoo Lee, Chief Economist, Economics and Development Resource Center

Working Groups
Theme Paper 1
Shahid N. Zahid, (Chair), Senior Sector Specialist, Agriculture and Social Sectors Department, East
(Note: replaced Sultan Hafeez Rahman, Senior Economist, Programs Department, East)
David Edwards, Assistant Chief Economist, Project Economic Evaluation Division
Richard W.A. Vokes, Senior Programs Officer, Programs Department, West
Carl Amerling, Senior Project Economist, Agriculture & Rural Development Division, East
Xianbin Yao, Senior Programs Officer, Programs Department, East
Hua Du, Economist, Programs Department, West
Mandar Jayawant, Economist, Agriculture & Rural Development Division, East

Theme Paper 2
Dimyati Nangju, (Chair), Lead Agronomist, Agriculture and Social Sectors Department, West
Njoman Bestari, Agricultural Economist, Forestry and Natural Resources Division, East
Siew Tuan Chew, Senior Project Specialist, Agriculture & Rural Development, Division, East
Robert J. Dobias, Senior Environment Specialist, Office of Environment and Social Development
Henry Tucker, Project Specialist (Forestry), Forestry and Natural Resources Division, West

Theme Paper 3
Nimal Fernando, (Chair), Senior Project Economist (Microfinance), Agriculture & Rural Development Division, West
Takashi Matsuo, Project Economist, Agriculture & Rural Development Division, West
Raymond Renfro, Senior Project Economist, Agriculture & Rural Development Division, West

Theme Paper 4
Indu Bhushan, (Chair), Project Economist, Education, Health and Population Division, West
(Note: replaced Arjun Thapan, Senior Project Specialist, Agriculture and Social Sectors Department, West)
APPENDIX 2

TRANSFORMING THE RURAL ASIAN ECONOMY: THE UNFINISHED REVOLUTION—SUMMARY

Mark W. Rosegrant and Peter B. R. Hazell

Much of Asia faced a desperate situation in the 1960s. Agriculture was the major source of income and employment for most of the population, but its productivity was low and stagnant. At the same time, populations were growing rapidly, leading to accelerating demands for food and a rapidly increasing number of rural workers to employ. Many countries faced critical and increasing food security problems and the doubly difficult challenge of trying to absorb an increasing labor force while simultaneously increasing labor productivity. The food crisis in India during the mid-1960s was indicative of a worrying situation that existed more broadly across Asia, and of the increasing dependence of many Asian countries on food aid for their survival.

Since then, a quiet revolution has transformed much of rural Asia, driven by public policies and strategies that had clear impacts on agricultural and economic growth, poverty, and the environment. An economic transformation started in the countryside, but spread to the non-farm rural economy, then the general economy, fueled by a process of agricultural diversification and commercialization driven by new technologies that dramatically improved agricultural output. Instead of plunging into a Malthusian spiral of rapid population
growth and famine, the Asian rural and general economy underwent a dramatic transformation over the past 30 years, achieving a speed and level of agricultural, rural, and overall economic development in most Asian countries that far exceeded expectations. In South Asia, famine was averted and more, as cereal production rose by 93 percent between 1970 and 1995, while using only 4 percent more land, boosting per capita food supply from 2,105 to 2,361 calories per day. Gains in East and Southeast Asia were even more impressive: there, cereal production increased by 118 percent between 1970 and 1995 while using only 4 percent more land, pushing per capita calorie supply up from 2,004 to 2,675 calories per day. In developing Asia, annual incomes per person nearly tripled, from $177 to $512 between 1970 and 1995: rising in the People’s Republic of China (PRC) from $91 to $473, in Indonesia from $207 to $706, and in India from $241 to $439 (all figures in 1987 real dollars). These strong upward trends in both incomes and agricultural production have contributed to rapid reduction in poverty despite increasing population pressure: in 1975, six out of ten Asians lived in poverty, but by 1993, only two out of ten East Asians and four out of ten South Asians did.

Despite these remarkable successes, Asia continues to face major challenges. A devastating financial and economic crisis struck East and Southeast Asia in 1997, raising doubts throughout Asia about the sustainability of rapid growth. At the same time, the public sector’s role in growth has come under fire, as budgets get cut back, governance issues are aired, and the latitude for country-level policy making seems to have been narrowed by the globalization of the world economy. In addition, some negative environmental effects of past growth have emerged that threaten to at least slow the pace of further growth. Potential solutions, such as the revolution in biotechnology, are feared to carry their own threat to the environment.

The financial and economic crisis in East and Southeast Asia cast doubt over continued rapid growth throughout the region. Against this background, the challenges to future
growth loom large, as obstacles limit the expansion of both water and land available for agriculture, as well as yields in traditionally resource-rich as well as resource-poor areas. Still, lessons learned in the process of the rural transformation thus far point the way toward a future where economic growth and inroads against poverty continue, even as threats to the environment are lessened. Yet such a successful future hinges critically on policy choices: they exist alongside alternative, bleaker futures for agriculture and the rural economy in Asia if nothing, or not enough, is done.

**AGRICULTURAL GROWTH AND THE ECONOMIC TRANSFORMATION**

While stable macroeconomic policies, a pro-market orientation, export-oriented trade policies, and significant public investments in education and infrastructure have been fundamental to economic growth in Asia, the fact is that broader economic growth has been built on a foundation of successes in agriculture. Aside from the city-states of Singapore and Hong Kong, China, the economies that grew earliest and fastest were precisely the ones where the earliest stages of economic growth were fueled by a takeoff in agricultural production. Rapid agricultural growth proved a formidable engine for beneficial effects that permeated the rest of the economy through several paths to spark growth in the rural nonfarm and urban sectors.

Since green revolution technologies boosted production using less labor without requiring a lot of capital, agricultural labor could more easily flow to areas of promise in other sectors, food prices fell, and the economy had less need to import food and could even export it, freeing up foreign exchange for other uses. Higher incomes from agriculture caused domestic markets to expand. Growth in the nonfarm economy came to outpace that in agriculture as rural areas began to diversify and in many countries the manufacturing sector grew rapidly as well.
In fact, rapid agricultural and economic growth has been the key to dramatic reductions in both total poverty and rural poverty in most of Asia over the past three decades. Since poverty is largely a rural phenomenon and since many of the poor depend, directly or indirectly, on the farm sector for their incomes, growth that raises agricultural productivity and the return to farm labor is particularly important in reducing poverty. Countries with the most rapid agricultural growth, the PRC and Indonesia, have had the most rapid reduction in total poverty, while the countries with slower agricultural growth, such as India, have had slower reductions in poverty. Agricultural growth also drives rural poverty reduction: within India, differences in the growth rate of average agricultural output per hectare were important in explaining cross-state differences in rural poverty reduction between 1958 and 1994. The initial endowments of physical infrastructure and human resources, which reflect public spending priorities, have also played a major role in explaining the trends in rural poverty reduction. Higher initial irrigation intensity, higher literacy, and lower initial infant mortality all contributed to poverty reduction in rural areas, but raising the incomes of the poor and thus lifting people above the poverty line requires broad-based economic growth. The countries that have been most successful in attacking poverty have achieved rapid agricultural growth and broader economic growth that makes efficient use of labor and have invested in the human capital of the poor.

Yet not all countries underwent the transformation—growth in agriculture spurring on yet more rapid, broad-based growth economy-wide, with dramatic reductions in poverty—equally successfully or equally quickly. Countries less successful in adopting a broad-based green revolution, whether because of constraints to adoption of the technologies themselves or to the avenues for growth that followed adoption, developed later or more slowly, leading to the broad disparities among and within Asian economies.
AGRICULTURAL DIVERSIFICATION AND COMMERCIALIZATION

The rural transformation—and the initial impetus for broad-based economic growth—began for most Asian countries in the mid-1960s with the emergence and spread of the green revolution: crop technologies accompanied by large investments in irrigation. Rice and wheat yields increased dramatically, leading to rapid growth in productivity in agriculture and in food supplies, increases in rural employment, rising per capita incomes, commercialization of agriculture, reductions in rural poverty and malnutrition, and a sharp decline in dependence on food aid. The technological revolution in agriculture has induced a shift from subsistence farming to commercial, profit-oriented farming. This shift has been reinforced in many countries by rapid national economic growth, trade liberalization, and urbanization. The share in production generated by specialized enterprises for crop, livestock, poultry, and aquaculture products has increased rapidly in many countries. Rapid technological change, improved rural infrastructure, and diversification in food patterns support a more diversified market production, leading to specialization at the farm or unit of production level.

Concerns have arisen over possibly adverse consequences of agricultural commercialization and diversification on the welfare of the poor, but the process has usually been beneficial to the poor; appropriate government policies, moreover, can alleviate many of the possible adverse transitional consequences. Further advances in crop productivity and management, for example, brought to the farmer via extension, would allow farmers to make better use of the natural resources they have access to, without contributing unnecessarily to environmental degradation. Policies that secure farmers’ rights to natural resources such as land and water would likewise translate into incentives for more productive investment that also conserves those very resources. Adding further to farmers’ flexibility in the face of economic shifts would be investments in education, health, and sanitation.
THE RURAL NONFARM TRANSFORMATION

As agricultural production grew and commercialization proceeded, rural nonfarm activities prospered and diversified, with particularly strong growth in agricultural processing and rural trade and services. With incomes on the rise throughout rural areas, consumer demand for nonfarm goods and services also went up, stimulating growth in those rural economic activities that are not agricultural. Today, the rural nonfarm economy, which accounts for 20–50 percent of total rural employment, has become increasingly important, with rural nonfarm income a growing source of income for rural and farm households as development proceeds. The benefits of growth have spread from the rural nonfarm economy to the urban economy, contributing to its growth and transformation in turn.

Without village access to rural towns and marketplaces, effective demand linkages within rural regions cannot be established nor the benefits of nonfarm economic growth spread. Other essential ingredients are effective local government, legal and financial institutions, and investments in general education to help rural people diversify successfully into nonfarm activity.

SOURCES OF AGRICULTURAL GROWTH

The rural transformation was fueled by the technological revolution in Asian agriculture and has been based on rapid growth in both input use and productivity. The green revolution substantially increased agricultural output beginning in the late 1960s. Growth rates in input use are declining, however, as many regions in Asia are reaching high levels of input use, and growth in total factor productivity (a measure of increases in output not accounted for by increases in inputs) has also recently slowed in much of the region.
One of the biggest factors behind declining productivity growth has been the relative neglect of public investment in agricultural research during the 1980s and continuing into the 1990s. With the burden on productivity-driven growth for the future, this trend is more than worrisome. Private research also yields substantial public benefits, and private investment in agriculture is likely to increase in importance, if policy reforms continue to improve the incentives for private investments by eliminating price distortions and strengthening property rights. Market failures and social objectives will continue to call for an important role for public investment in agriculture, however. In particular, a sustained public role in funding agricultural research will be essential.

THE EVOLUTION OF CEREAL AND LIVESTOCK SUPPLY AND DEMAND

Dramatic shifts in food-demand patterns in Asia have accompanied the commercialization of agriculture. Rising incomes and rapid urbanization are changing the composition of demand. Direct per capita food consumption of maize and coarse grains are declining as consumers shift to wheat and rice with increasing incomes, and again from rice to wheat as lifestyles change with urbanization and further income growth. Offsetting this trend somewhat, particularly for maize, is growth in demand for cereals as animal feed, as these same changed lifestyles and higher incomes have driven strong growth in per capita and total meat consumption, especially poultry and pork.

Cereal production growth in developing Asia has slowed since the early 1980s due to declining world cereal prices and to factors related to the increasing intensification of cereal production. Declining cereal prices have caused a direct shift of land out of cereals and into more profitable cropping alternatives, and have slowed the growth in input use, and therefore yields. Probably more important in the long run,
declining world prices have also caused a slowdown in investment in crop research and irrigation infrastructure, with consequent effects on yield growth. Environmental and resource constraints have also contributed significantly to the slowdown in yield growth. The use of high levels of inputs and the achievement of relatively high cereal yields (particularly for rice and wheat) in parts of Asia have made it more difficult to sustain the same rate of yield gains, as farmer yields in these regions approach the economic optimum yield levels. At the same time, increased intensity of land use has led to increasing input requirements in order to sustain current yield gains. Moreover, environmental degradation accompanying crop intensification does raise some concerns for ability to meet even a decelerating demand growth.

Rapid growth in demand for livestock will put great pressure on livestock production systems in Asia. For the livestock sector in Asia to continue its growth, some major changes in the way livestock is produced—by whom, on what scale, with what technology, and with what quality guarantees for the broader market—will need to take place. The low productivity of traditional smallholder animal husbandry will no longer suffice. Still, this path does hold greater risk for the environment; policies to help overcome these challenges must take that threat into account.

**IMPACTS OF TRADE, MACROECONOMIC, AND PRICE POLICY ON AGRICULTURE**

Beginning in the 1980s, the significant production increases achieved through the green revolution, plus a changing global trade environment, enabled many countries to adopt a broader definition of food security and to gradually reform both price policies and trade and macroeconomic policies, moving toward trade liberalization. This long-term policy evolution was temporarily interrupted in the early 1990s when the competitive position of agriculture and other tradable
sectors began to erode due to the dramatic appreciation in real exchange rates in East and Southeast Asia (and a significant but smaller appreciation in South Asia) as a result of macroeconomic policies and the massive influx of short-term foreign capital.

However, the sharp depreciation of currencies in several countries in East and Southeast Asia during the financial and economic crisis beginning in 1997 eliminated effective taxation of agriculture caused by real exchange rate overvaluation and should provide a significant stimulus to agriculture in these countries. The continued reform of trade and macroeconomic and price policies to create a level playing field across economic sectors and across agricultural commodities and to provide a stimulating environment for agricultural exports would provide further incentives for efficient agricultural growth.

ECONOMIC REFORM IN ASIAN TRANSITION ECONOMIES

Two distinct groups of transitional economies can be identified: first, the PRC plus the centrally planned economies of Southeast Asia—Viet Nam, Cambodia, Myanmar, and the Lao People’s Democratic Republic—and second, the Central Asian Republics and Mongolia. The challenges facing these country groups and their economic performances are quite distinct. In the PRC and Southeast Asia, market-oriented reforms have generated rapid growth in the rural economy that has helped to stimulate broader economic growth. In Central Asia, attempts at economic reform have been hampered by the devastating economic depression that followed the disruption of prior economic relationships with the Soviet Union.

The agricultural sector has played a pivotal role in determining the early pace of reform and constitutes an important backbone for the acceleration of economic growth in transition economies. Moreover, rapid growth in the
agriculture sector helped cushion the adverse impacts of initial dislocations due to reform in the nonagricultural sectors, providing for a degree of income stability at the onset of the reform process. Because of the crucial role of agriculture in the transition process, market-oriented reforms in the Central Asian transition economies must be accelerated, but in a way that enhances the capacity of agriculture to act as a buffer as other macroeconomic policy reforms affect other sectors. Required reform measures include a comprehensive land reform and restructuring of both state and collective farms, removal of state intervention, and liberalization of input and output markets, as well as the rebuilding of banking and financial services for agriculture.

For both groups, the existence or early creation of an economic, legal, and social enabling environment responsive to policy reforms and conducive to openness and investments is essential for all types of reform measures undertaken during the transition process. Trade liberalization in particular can help jump-start aspects of the transition and has been key to the relative success of the East Asian transition economies vis-à-vis the Central Asian economies.

THE FINANCIAL AND ECONOMIC CRISIS IN EAST AND SOUTHEAST ASIA

After years of extraordinarily rapid growth, several East and Southeast Asian economies in 1997 entered a period of economic crisis that jeopardized at least short-term economic growth. The crisis was caused by a deterioration in fundamentals, including significant real appreciation of currencies and large and growing current-account deficits financed with the accumulation of foreign debt. Concern over fundamentals and a sharp drop in export performance induced an international financial panic that led to massive withdrawal of short-term international capital and caused widespread financial crisis and real or de facto bankruptcies for banks
and firms, which could not repay the very large amounts of foreign currency-denominated foreign debt. The withdrawal of international capital together with the virtual collapse of domestic bank capital was an enormous contractionary shock to the real economies of the crisis countries.

The financial and economic crisis has had severe negative social impacts in the affected countries, including declining incomes and increasing unemployment, rising absolute poverty, increases in malnutrition, increased pressure on already underserved rural areas, and declining social services and threats to education and health status, in particular of children and women. The impact on the rural economy has been mixed, with depressed incomes and employment in some nonfarm rural activities, but improved incentives due to devaluation that have stimulated agriculture. In the short run, the relative buoyancy in the rural economy has served as an important buffer that has reduced the negative impact of the financial crisis on the poor. The long-run effects of the crisis on agriculture remain uncertain, in particular whether the countries can convert the ongoing agricultural export boom to long-term growth in production and trade. In the wake of the economic crisis, the public sector faces crucial challenges to enhance transparency and accountability, improve efficiency and effectiveness, and reduce the opportunities for corruption—all governance issues that the crisis itself pointed up as factors that are now constraining sustained economic growth.

ENVIRONMENTAL AND RESOURCE CHALLENGES TO FUTURE GROWTH

Rapid agricultural growth has had unintended consequences for the environment. Agricultural intensification per se is not the root cause of lowland resource-base degradation, but intensification combined with an inappropriate policy environment has encouraged monoculture systems and excessive or unbalanced input use. Trade policies,
output price policies, and input subsidies have all contributed to the unsustainable use of Asian lowlands. The dual goals of food self-sufficiency and sustainable resource management have often been mutually incompatible.

Environmental pressures are increasing because existing land and water resources are under threat from rapid urbanization, which will increasingly withdraw land from agricultural production and create pressure for reallocation of water now used in agriculture. Moreover, capacity for expansion is limited by suitable land for cropping on the one hand and high costs of developing new water supplies on the other. The productivity of the existing land base is not assured, due to land degradation from soil erosion from wind and water, chemical degradation (loss of nutrients, soil salinization, urban-industrial pollution, and acidification), and physical degradation (compaction, waterlogging, and subsidence of organic soils). Nor is productive use of water guaranteed, as some of the limitations from inefficient use of water are compounded by problems of inefficient or aging irrigation systems. Water scarcity is increasing and within the next decade or two, many Asian countries will approach crisis levels, where there will simply not be enough water to meet all their needs for all or part of the year.

Reforms must be tailored to specific locations, but important elements include the establishment of secure water rights of users; decentralization and privatization of water management functions to private companies or user groups; and the use of incentives, including markets in tradable property rights, pricing reform and reduction in water subsidies, and effluent or pollution charges.

CHALLENGES FOR LESS FAVORED ENVIRONMENTS

All Asian countries will need to continue to increase their labor productivity in the rural sector in the years ahead,
although the nature of the challenge will be different for countries at different stages of economic transformation. For the poorer countries, where agriculture is still the dominant source of employment and population growth is still high, the challenge will be to create the additional jobs needed to absorb the expected growth in the rural labor force, while at the same time increasing labor productivity, and hence the opportunities to reduce poverty and raise living standards. This challenge will be particularly daunting for less favored, resource-poor areas that have not shared significantly in the benefits of rapid growth.

While past agricultural development strategies in Asia have been spectacularly successful in many countries, large areas of less favored environments have been neglected and lag behind in their economic development. These lands are characterized by lower agricultural potential, often because of poorer soils, shorter growing seasons, and lower and uncertain rainfall, but also because past neglect has left them with limited infrastructure and poor access to markets. Despite some out-migration to more rapidly growing areas, population size continues to grow in many less favored areas, and this growth has not been matched by increases in yields. The result is often worsening poverty and food insecurity problems and widespread degradation of natural resources (e.g., mining of soil fertility, soil erosion, deforestation, and loss of biodiversity) as people seek to expand the cropped area. These problems indicate that, on poverty and environmental grounds alone, more attention will have to be given to less favored lands in setting priorities for policy and public investments. The successful development of less favored lands will require new and improved approaches, particularly for agricultural intensification.
LESSONS LEARNED – TOOLS TO FACE NEW CHALLENGES

Public policies are all-important in creating the enabling environment for market-based agricultural development.

While the last three decades have been remarkable for the failure of central planning and a turn toward market-oriented economic development in Asia, the experience of the past three decades has also demonstrated the paramount importance of government in implementing an enabling environment for market-based development, and in particular for investing in the critical public goods of agricultural research, rural infrastructure, and education.

Agricultural and rural growth have been driven fundamentally by public investment in agricultural research and extension to generate productivity- and income-enhancing technologies, by public investment in expanding irrigated area and in rural infrastructure; and by the existence (or introduction) of secure property rights to land. These policies have provided the main sources of productivity growth and facilitated rapid growth in input use. The continued profitability of public investment in agricultural research strongly indicates that governments are underinvesting in research. While the rates of return on each public investment or policy separately have been high, taken together the return is even higher, given the synergies they create for broad-based growth.

As agricultural growth took off, other factors were increasingly important to sustaining and enhancing this growth, including economic liberalization, especially trade and macroeconomic reform and deregulation of agriculture; development and liberalization of rural financial markets; and investment in the social sectors, particularly education, health, and nutrition. Macroeconomic stabilization and trade
liberalization have been essential components of the policy-reform process for both agricultural and general economic growth in Asia. Openness to global markets and international trade allows the economy, according to its comparative advantage, to catch up technologically and to adapt the labor force and capital stock to changing factor endowments. Trade liberalization directly boosts trade growth and instills competitive, market-oriented behavior in the transition economies.

Policies are needed for dealing with the unintended consequences of Asian rural growth.

The policies outlined above will be necessary but not sufficient to continue rapid growth in Asia in light of new challenges, as unintended negative consequences of agricultural growth have grown in magnitude to pose serious problems. Chief among these unintended consequences are environmental degradation and growing regional disparities that threaten to isolate resource-poor areas and prevent them from sharing in growth.

Two main types of environmental degradation have occurred in Asia. In irrigated and favorable rainfed environments, intensification of agricultural production, combined with sometimes flawed incentives due to inappropriate policies, has caused substantial environmental degradation. In resource-poor areas, continuing population growth and a scarcity of good land has forced the expansion of cropped area to encroach on forested and woodland areas and expand onto steeper slopes, with increasing soil erosion.

In order to promote economic growth and redress poverty and environmental problems, then, Asian policymakers will need to pursue appropriate and sustainable methods of agricultural intensification for both high- and low-potential regions. This dual strategy will be particularly challenging if government budgets for investment in agriculture
and rural areas continue to remain tight; striking the right investment balance between irrigated and rainfed regions, and between high- and low-potential rainfed areas will be particularly important. While out-migration and economic diversification should become increasingly important in the development of areas with low agricultural potential, agricultural intensification will often offer the only viable way of raising incomes and creating employment on the scale required in the near future.

Policies are needed to overcome weakness in governance in the public sector so economies can handle new challenges.

Beyond unintended consequences of past growth, additional reforms in the Asian economies will be necessary to face the new challenges of today. First, as highlighted by the economic crisis, weakness in governance in the public sector and beyond has become an impediment to rapid growth. A concerted effort to rectify the severe weaknesses in governance revealed by the economic and financial crisis in East and Southeast Asia is needed to get the region back on track for continued economic growth. Governance reforms must seek greater transparency and accountability in public-sector activities while improving efficiency and effectiveness; reducing the opportunities for corruption; and fostering the creation of an independent, meritocratic civil service. Reform in the delivery of services involving government, civil society, and religious institutions in a diversified strategy would help reduce the risks of relying on only one delivery system.

Second, as underscored by recent agricultural research, new growth in crop productivity is unlikely to come exclusively from traditional breeding techniques, but via a new biotechnology revolution, with potential threats to the environment that must be taken into account at the time of the revolution (rather than in its wake, as we are now doing with the green revolution). As reemphasized almost daily with
rapid international flows of factors, continued economic growth will also depend upon countries’ ability to effectively manage globalization.

But how much of this growth in productivity will take place in Asia, and with what public-sector role when biotechnology research is currently dominated by the private sector in developed countries, remain open questions and will depend on effective public policy. It will be crucial to increase biotechnology research aimed at the situations prevalent in developing countries. Facilitating some new institutional arrangements between developed and developing countries and in developing country research institutes would be a move, perhaps by international agricultural research centers, to foster local biotechnology capacity, sharing of information across countries, and collaboration with private-sector partners by removing unnecessary barriers to the free movement of plant materials, clarification of biosafety regulations, and provision of improved property rights protection for new products.

Finally, apart from this new technological revolution but certainly in the face of it, trends in the late 1980s and early 1990s of declining growth in investment are particularly alarming. Public investment must continue to play a primary role in Asian agricultural research, because private companies will not invest in essential crops, such as wheat and rice, where they cannot achieve adequate returns. The declining trend in public agricultural research should therefore be reversed, while private investment in research can play a key role for other commodities.

ALTERNATIVE FUTURES FOR ASIAN AGRICULTURE AND FOOD SECURITY

Projections of long-term food security in Asia show that per capita availability of food in Asia will increase and real world food prices will be steady or declining slowly for the main food commodities, under a baseline scenario that projects
continuation of existing agricultural and social sector policies. However, these positive aggregate outcomes hide the massive human suffering that would continue under the business-as-usual baseline scenario. Despite gains from trade and the overall ability of the world’s productive capacity to meet effective demand for food, there is projected to be only slow improvement in food security in Asia as measured by the number of malnourished children, with 113 million children suffering from malnutrition in 2010, including 83 million in South Asia.

Moreover, food security is vulnerable to relatively small declines in policy efforts relative to the business-as-usual scenario. Policies that moderately disfavor agriculture and natural resources, reduce social investment, and moderately slow economic reform lead to much worsened food-security impacts compared to the baseline. Complacency toward agricultural and social investments risks severe negative food security impacts. Conversely, the results shown here indicate that a significant assault on child malnutrition in Asia could be mounted within the boundaries of plausible long-term performance of the Asian economies. Moderate but important reductions in child malnutrition can be achieved through relatively small improvements in income growth, investment in agricultural research and irrigation, improved water policy, reductions in environmental degradation, slower population growth, and increases in social investments. But the near-elimination of child malnutrition will require policy reform and public investment that produce dramatic long-term gains in income growth, agricultural productivity, and social indicators. Although the precise set of policy reforms and the priorities and magnitudes of increases in investments required to eliminate child malnutrition would need to be determined in detail for each country, the results here indicate that the three foundations for success are broad-based economic growth, growth in agricultural production, and investment in social services including education and health. Failure in any of these three areas will severely hamper efforts to eliminate child malnutrition.
In the face of this challenge, the completion of the rural transformation of Asia will take renewed efforts on the part of governments. Successful countries must not turn away from their market orientation but rather support the private-sector role where possible and supplement it where not. But it must also involve both continued economic liberalization to bring market forces to bear on economic development processes and effective and efficient government to provide an appropriate institutional, legal, and policy environment for market-oriented development. Governments must both invest in and facilitate private-sector investment in agricultural research, education, infrastructure, and other public goods, and relinquish other activities best undertaken by the private sector or civil society. Indeed, government has a role to play in developing a more effective distribution of responsibilities among these actors.

The challenge for governments in today’s Asia, both for economies in transition from central planning to market orientation and for those that have already experienced substantial growth via market reform, are daunting. For, as the recent economic downturn and globalization processes have underlined, governments must dramatically improve governance in the face of increasing global economic complexity in order to sustain agricultural growth and rural gains as an engine for broader development. Success will require a renewal of governance itself: transparency, responsiveness, and eradication of corruption are all keys to sustained growth in the next century.
APPENDIX 3
THE GROWTH AND SUSTAINABILITY OF AGRICULTURE IN ASIA—SUMMARY

Mingsarn Santikarn Kaosa-ard and Benjavan Rerkasem
With contributions by Shelley Grasty, Apichart Kaosa-ard, Sunil Pednekar, Kanok Rerkasem, Paul Auger

The performance of Asian agriculture in the last two decades has indeed proven to be a real Asian miracle. This is demonstrated by the fact that Asia has been able to meet the increased demand for food of more than one billion additional people over that time despite earlier predictions of major food shortages and starvation. This success was to a large extent made possible by investments in technology and infrastructure, especially roads and irrigation, extension systems, and institutional reforms that revitalized market incentives. Central to this success was a package of technology comprising high-yielding crop varieties, fertilizers, chemically oriented crop protection, and good water control. The package was produced for the major food crops, namely rice, wheat, and maize. Because of the revolutionary nature of the high-input high-output technology package, its extraordinary effect on agricultural production is often referred to as the green revolution.
The green-revolution package was based on powerful technology that offered a remarkable increase in yields, which were many times greater than the yield of the more productive traditional varieties. However, it has experienced second-generation problems. Some symptoms of unsustainability have also been detected by scientists in the intensive monocropping aspect of the system. High input use has led to increased pest resistance and health problems. The green-revolution technology was designed for production in more favorable environments only, especially in areas with good access to water. Critiques of the green revolution have considered the high input nature of the package not only to be unsustainable but also inequitable.

As the Asian population continues to grow, albeit at a decreasing rate, the already large population base of Asia means that the total number of people to be fed in the future is enormous. At the same time, natural resource constraints to further increases in production are becoming more discernable as competition for their use, both as inputs and as sinks, has led not only to increased conflicts between the public and private sectors but also to conflict within the public and private sectors themselves.

This volume seeks to answer two questions. First, is Asian agriculture sustainable, and if there is some indication of unsustainability, what are the causes? Secondly, what is the role of agriculture in helping to find a way to sustainable development?

SUSTAINABILITY OF ASIAN AGRICULTURE

An investigation into production performances over the past two decades has revealed some early indications of unsustainability. Firstly, the growth of yield per unit area of some major staple crops is demonstrating a declining trend, and this slowdown is most obvious for rice. Secondly, there is a demonstrated preference among farmers to diversify away
from the major staple food crops and into high-value crops, such as horticulture and oil crops, and from the high-yielding varieties to varieties of higher eating quality. Thirdly, the benefits of the green revolution have been largely confined to favorable environments or resource-rich areas. Therefore, farmers in less favorable environments (LFEs) continue to rely on extensive farming for their living.

In the livestock sector, especially the relatively fast-growing monogastric sector, market-driven growth has been particularly rapid in urban centers and has led to the intense concentration of production units in periurban centers. This has resulted in increased pollution and health risks, to such an extent that long-term growth may not be sustainable. There is a role here for the public sector to coordinate production so that waste discharges can be recycled as an energy source or be put to more efficient uses.

Marine fisheries reveal the most troubling picture. Although their growth has been strong, their long-term sustainability, especially that of coastal fisheries, is greatly threatened by overfishing. Catches per unit effort in some overfished waters are only a small fraction of what they were three decades ago. Some species have become extinct in their traditional locations. Coastal and inland aquaculture is threatened by pollution from outside sources. In addition, inland aquaculture is constrained by the availability of water of suitable quality.

FACTORS DETERMINING SUSTAINABILITY OF ASIAN AGRICULTURE

Environmental degradation related to agriculture is a product of technological and policy failures. High-input technology creates onsite second-generation effects that can be corrected by improved research, development and extension (RD&E). In LFEs, the lack of appropriate technology is a major source of environmental degradation. A lack of appropriate
policy and institutions, as well as lax law enforcement, is the main source of external costs and the wasteful use of resources.

Intensification-induced declines in productivity growth in intensive and monocropping systems have been suggested as a possible threat to future growth in crop production, but these could be solved by adjusting the current mode of crop-based and laboratory-oriented R&D to field- and farmer-based technology transfer systems. Many of these problems, however, can be solved by improved field-level knowledge, better crop management, and better communication between farmers and R&D officials. Agricultural R&D and technology transfer will have to be sufficiently adaptive and responsive to deal effectively with these problems as they arise. This becomes even more challenging when dealing with agriculture in LFEs, which have benefited only marginally from the green revolution.

The sustainability of Asian agriculture will depend on the prudent use of natural resources and careful consideration for the environment. The natural resource base of Asia is now under great stress, which will become even greater as the population continues to increase. Investment in environmentally sensitive technology is needed to ensure sustainability. The current constraints related to natural resources are not the result of limits on supply but rather of managerial and institutional problems. The solutions to the current problems in sustainable agriculture no longer simply lie in technology, but also in institutional reform.

Sectoral policies, especially policies related to natural resources, are outdated and lag behind the socioeconomic changes that have altered the patterns of resource use. Throughout Asia, water resource management has been fragmented and project-based. Both surface and groundwater are mostly under open-access regimes that encourage wasteful usage. This in turn may lead to waterlogging and salinity problems. In Asia, water pricing has been adopted by many countries but mainly only for the purpose of paying for the operation and maintenance costs of irrigation, rather than as a basis for allocation purposes. Key factors for developing the
long-term sustainability of both the agricultural and the agriculture-based sectors are the removal of policy distortions and institutional constraints in the natural resource sector, and at the same time promotion of participatory management.

In the past, technology was used to circumvent the need for policy and institutional reforms that may have been economically and socially desirable but politically impractical. In the future, appropriately designed technology will remain a very important tool, but it cannot solve all of the problems and sometimes creates problems of its own. Importantly, the green revolution has bypassed LFEs, which make up a large part of the agricultural area of Asia.

CHALLENGES AND OPPORTUNITIES FOR ENHANCING AGRICULTURAL GROWTH AND SUSTAINABILITY

The LFEs and fragile ecosystems that are prone to degradation pose some of the most significant challenges for technology producers and policymakers. These areas tend to be associated with poverty, making long-term investments by individual farmers for productivity enhancement through conservation activities unattractive.

Another challenge lies in dealing with environmental issues in the arena of international trade in agricultural products, especially in issues related to phytosanitation. For developing Asian countries in Asia wishing to export agricultural products to their high-income trading partners, especially countries in the European Union, agricultural trade is no longer simply an outlet for surplus production; farms and their processed products need to be tailored to meet the specific phytosanitary requirements of the consuming country. This issue demands special extension and education on optimal pest control and farming techniques, as well as on sanitation control facilities such as landing sheds for small-scale fisheries.
Exporters to the United States have to adapt to much less predictable trade-related environmental requirements and restrictions, which are often more the result of pressure from environmental movements than actual government policy. These requirements and restrictions may not be related to product characteristics but to production processes themselves that are required to be environmentally friendly.

**ASIAN AGRICULTURE: TOWARDS 2010**

The next decade will not bear witness to a great leap forward in productivity gains for the major food crops. Nevertheless, there should be substantial aggregate increases from the incremental gains from better technology management (related to crops, soil, and water use) in both favorable and less favorable environments. Biotechnology can offer many opportunities in facilitating research, reducing costs, and shortening the time taken for research projects. Increased public investment in technology, including biotechnology, is essential in agriculture-based industries, not just in agriculture itself. These industries offer more possibilities for processing, the added value of which is higher than that of the basic agricultural commodities, and therefore possess strong economic possibilities for developing Asian economies.

Under the business-as-usual scenario, high growth in the yields of food crops, especially rice, will not be sustainable. This is mainly due to the high costs associated with maintaining growth and the continuing diversification out of basic food crops and into crops with higher profit margins. The high costs associated with maintaining growth are the direct results of poor management and environmental degradation. If the current institutional management policies remain unchanged, the availability of water will increasingly constrain the potential for sustainable growth. As the competition for water between different users increases, water will inevitably be shifted away from agriculture, where the marginal product of water is relatively low.
The coastal, aquatic, and wilderness resources that are essential food items and contribute to the livelihood of the poor will be mostly depleted. Furthermore, more farmers in resource-poor and coastal areas will be left further and further behind as the world continues to move into the electronic age.

A desirable future is considerably different from the situation described above. It is one in which Asia is free from hunger and Asian agriculture has an increased and sustainable capacity for more equitable and greener growth. Greener growth is growth where increases in productivity do not arise as a result of the unsustainable use of natural capital and the environment. Production increases should come about through higher yields per unit area, and not simply through increasing the area of land under cultivation. Equitable growth is growth whose benefits reach all sections of the community, even the poorest of the poor. As food security on the Asian continent becomes a diminishing concern, more attention needs to be paid to the elimination of hunger and malnutrition. Agriculture will no longer be mistakenly perceived as a sunset industry, but as a vibrant life- and growth-support system. Agriculture will be viewed as a sector that offers income-generating and employment opportunities, not only as the sector of last resort.

In order for this future to be realized, the main priority for governments will be to strengthen their policies and institutions regarding natural resources. The overextraction of open-access resources and multiple-use conflicts will have to be resolved through a combination of economic, legal, and social instruments. Responsible agriculture and fishing will have to become the prevailing codes of conduct. The conservation of natural resources and the environment will have to be additional national objectives, and biophysical planning will have to be the norm rather than the exception.

The public sector must actively continue to support investments in education and technology. Large infrastructure investments will be based on rigorous cost-benefit analyses, with due recognition being given to social and environmental costs and payoffs. The public sector, however, will not necessarily continue to be a direct provider of public goods,
but rather promote and facilitate private investment and adopt the role of regulator for the purpose of providing a level playing field for private operators, from individual farmers to multinational corporations. Government operations will be less labor intensive as the labor-intensive activities of maintenance and monitoring are privatized or devolved to local organizations. The public agricultural agencies will be more flexible and adaptable, and will adopt a more managerial role.

RECOMMENDATIONS

This paper recommends priority strategies in three areas: integrative technology production and transfer, less favored environments and fragile ecosystems, and natural resources and environmental management.

Strategies for Integrative Technology Production and Transfer

The challenge facing technology production is no longer simply to further raise the yield ceiling of food crops in favorable environments. It is to ensure that the technology will enable profitable (low-cost) production for farmers and that the output will be affordable to consumers, especially the poor. For LFEs, technologies will have to be tailored to meet local needs and particular deficiencies in local resources.

A three-pronged approach is recommended. First, technological production and management need to take potential environmental impact into account. Technology should have the objectives of resource conservation and product enhancement. Second, the technology production and transfer system must be focused on the end-users, the farmers. This implies the need for two-way communication between farmers and RD&E agencies. Third, technology will have to be based on modern science, but local and traditional knowledge can and should be harnessed and combined with formal
science. Compared with the existing system, the approach recommended is more location-oriented than crop-centered.

Sustained increased public investment is necessary in R&D, both in conventional R&D technologies and in biotechnology. This is especially true for rice, which has experienced the sharpest decreases in yield growth. An international management system or code of conduct that recognizes and protects traditional or prior users’ rights to the knowledge they have developed, while also providing sufficient incentives for private R&D initiatives, is required in order to maintain the free flow of genetic material to international research centers.

**Strategies for Less Favorable Environments and Fragile Ecosystems**

Asia’s less productive croplands, which also tend to be the most poverty-stricken areas, have been bypassed by the green revolution: clear evidence that the widely adopted green-revolution technology is inappropriate there. Further public investment, in the form of inputs for the recapitalization of the land (with phosphates or the buildup of organic matter, for example) as well as for RD&E, towards social and environmental, as well as economic, goals may be essential for the generation of further growth.

Recommended objectives for breeding programs include a) enhancing phosphorus utilization efficiency, with or without increased tolerance to soil acidity, and b) increasing drought tolerance. Other objectives could include better adaptation to particular problems that have already been identified for specific LFE locations, such as tolerance to salinity for salt-affected areas or boron efficiency for much of Asia’s highly leached soils in both the uplands and lowlands.

The highest priority should be given to breeding for phosphorus efficiency and drought tolerance in rice; and in soybeans and the other major grain legumes, for phosphorus efficiency, with or without increased acidity tolerance. Improving boron efficiency would be the most cost-effective way
to increase wheat yields in some of Asia’s poorest areas, including Bangladesh, the southwestern PRC, northeastern India, and Nepal. Breeding programs to improve boron efficiency would also help to raise the yield ceilings of Asia’s major pulses, including green gram, black gram, lentils, and chickpeas.

Attempts to increase the productivity of cropping systems in a sustainable manner in LFEs will call for an integrative approach to natural resource management or INRM. INRM has three important elements: a) a holistic focus on the entire ecosystem rather than on individual fields; b) farmer participation in the R&D process; and c) recognition that social/institutional solutions are often required in conjunction with, in addition to, or instead of technical solutions.

Another essential element of the holistic management of cropping systems in LFEs and fragile ecosystems is the monitoring of key offsite effects. The measurement of, for example, stream siltation, forest cover, biodiversity, stream flow (both quantity and distribution), and the incidence of forest fires, would provide quantitative indicators with which the success or failure of management could be judged. It is, however, essential that an appropriate set of criteria be available to each level of management, whether it be at the farm, community, catchment, or watershed level.

Strategies for Natural Resource and Environmental Management

In order to achieve sustainable agriculture, it should be noted that in the long term, natural resources and the environment are necessary components of all three priority strategies. The difference is that in the first strategy, the conservation of natural resources and the environment is one of the objectives of R&D, with the expectation that new technology involving onfarm practices will minimize environmental impact both on- and off-farm, and that technological innovations will be environment enhancing. In the second strategy, the technological management package addresses landscape-level management, for example, micro-
watershed management. It also requires local institutional support that is recognized by law. In the third strategy, it is management at the macro scale, e.g. at a bioregional level such as a river basin. This level of management would take care of cumulative subbasin impacts. Under this approach, interactions between different resource uses would be taken into account and trade-offs would become more transparent. An example of a larger-scale bioregional planning is the basin development plan for the Mekong River Basin under which transnational boundary impact can be managed.

This strategy will only be accomplished in the longer term and a few preparatory steps are necessary. First, the present system, which is based on administrative boundaries, must be readjusted to one that is based on biophysical and regional boundaries for the purpose of gathering information related to natural resources and local environments and their interrelationships and interactions. Second, the identification of “hot spots” is necessary. Hotspots are of two types. The first consists of those areas important to long-term agricultural sustainability, e.g., spawning grounds, biodiversity-rich habitats, and fragile ecosystems. The second consists of areas of high growth where sustainability indicators are showing early warning signs of degradation. Once this information is known, planning at the bioregional level can proceed. The planning process will have to encompass economic, social, and environment considerations concurrently.

At present, environmental planning is often a stand-alone process, with the ministry of environment attempting to be the sole guardian of natural resources and environment. Under the proposed strategy, growth and sustainability issues and the corresponding growth-oriented development and conservation projects are juxtaposed, prioritized, selected, and scheduled. Environmental and social impact assessments will also have to be undertaken at the planning level, prior to implementation.

Under this approach, the management of natural resources will be at the bioregional level by river-basin committees consisting of representatives from subbasins, for example. The organization should be bottom-up, i.e., starting with subbasin committees at
the lowest level. Each country should start with the region of highest economic and environmental priority, or with the highest level of multiple-use conflicts.

The proposed approach would comprise participatory planning, the establishment of principles for the allocation and use of natural resources and their management, zoning, and development of land-use plans. The issues of rights to the use of natural resources and the protection of those rights would have to be specified and established.

Wherever the capacity for effective local government and social organizations exists, the devolution of some responsibilities, i.e., local water resources, fire protection, and community forest management, has proven efficient and effective for both allocation (in the case of water) and conservation practices. The principle of the devolution of rights to and increased responsibilities for different resources to local communities and governments would have to be specified, acknowledged, and legalized.

Where local organizations and social capital do not exist, the identification of existing constraints and targets for capability building are necessary for the achievement of long-term growth. In either case, a check-and-balance system from the central government continues to be necessary in order to assure transparency and accountability.

Also recommended are corresponding changes in agricultural and other policies.

**Agriculture RD&E Policy**

LFEs will have to become target areas for productivity improvement. Priorities will have to be determined through a holistic approach, in which the evaluation of the cost-benefit trade-offs will involve the farming stakeholders.

The current top-down RD&E system will have to be reversed into one that starts locally, with commensurate funding increases to local agencies. A farmer-focused RD&E system will have to be designed at the district level. Local
agricultural colleges could be drawn into association with local RD&E systems. Rewards for scientists and extension officers would be based on the field performance experienced by farmers. R&D funding need not necessarily be limited to public agencies but could be extended to learning institutes, NGOs, and private companies on a competitive basis.

A pilot project, in which extension activities would be open to competition between the private sector, NGOs, and relevant government agencies, could be undertaken in agriculturally advanced areas. It would be under the supervision of local governments, farmer cooperatives, or water users associations, as appropriate. In such a situation, a block grant could be provided to the implementing organization. In the longer run, the contribution of farmers, especially those in resource-rich and agriculturally advanced areas, to the extension system would gradually assume more importance than government grants. The willingness of farmers to pay would also serve to help as a measure of the value of the extension system.

Continuous capacity building is one of the indispensable components of an effective RD&E system. Scientific staff need to be constantly upgrading their skills in order to keep up with international progress. Distance education and extension through the television and radio media could be introduced for junior, senior, and women farmers. Farmer-to-farmer transfers could also broaden the perspectives not only of other farmers but also of extension officers.

Natural Resources and Environment Policy

Natural resource policies tend to be among the most outdated policies in many developing Asian countries. The first priority for reform is for these policies to reflect fully the scarcity value of natural resources. This includes the value of natural resources both as inputs and as sinks. In other words, the open-access regimes that prevail despite resource scarcity will have to give way to systems where resources are properly valued and priced. The costs of such factors as pollution, which are currently external, will have to be internalized.
In Asia, the water sector and the coastal and ocean resources sector are two natural resource sectors that are priority sectors for reform. At present, the instruments used to correct for market failures in these sectors are mainly legal and regulatory instruments, implemented under command-and-control regimes. The continuous deterioration of natural resources and the environment to date is a manifestation of the fact that these regimes are no longer effective in achieving both growth and sustainability objectives concurrently.

Other instruments, such as economic instruments, concessions and property rights, pricing, charges, fees, and transferable development rights, need to be employed appropriately. Social instruments can also be very useful in attracting public attention to sustainability issues and, especially where voting is important, in creating the grassroots demand for reform that is essential for effecting reforms.

Other Policies

Equally important is the need to remove price distortions created by other policies that favor the use of environmentally unfavorable practices, for example, State subsidies for water and fertilizers and unwarranted outbreak subsidies for agrochemicals, fossil fuels, and electricity. The removal of these distortions would decrease the wasteful use of resources, encourage the use of greener energy, and increase the incentives for using integrated pest management, soil and water conservation, and alternative technologies. The same is true for the removal of distortions in output prices through protection, export taxes, price guarantees, and income support programs that encourage the expansion of environmentally unsound practices. New national priorities and public expenditure policies will need to incorporate environmental considerations. Impact assessment should become an integral part of national and sectoral policies as well as project implementation.
Project Implementation

The reforms described above require action at the policy and institutional levels. Reform is also required at the project implementation level. First, cost-benefit analyses should be rigorously applied during the project inception phase. Second, the potential environmental impact must be fully accounted for and included in the cost-benefit calculation. Third, public hearings must be a component of the approval process.

With a few exceptions, notably the People’s Republic of China and Viet Nam, which have implemented drastic policy reforms following the introduction of their open-door policies, past development efforts in most Asian countries have emphasized infrastructure development rather than policy reforms to improve the effectiveness, transparency, and accountability of government machinery. Technical solutions were and continue to be preferred to social and economic ones. The current practices of international lending agencies that require policy reforms as part of sector loans should be continued. For some countries, this has become the only channel through which sensible policies can be implemented, with decreased resistance from vested interest groups that are only interested in preserving the status quo. However, the pros and cons of policy reform and the likely impact should be made more transparent to those concerned if not to the public at large.
RURAL ASIA has undergone a fundamental economic transformation during the past three decades. Economic growth rates have been particularly high in East and Southeast Asia, and even the slower-growth countries have made progress. This growth has been accompanied by rapid structural transformation of the rural economy, decline in the relative importance of agriculture, increased use of sophisticated capital inputs in agricultural production, greater specialization in production, explosive growth of rural cities and towns, and an emerging heterogeneous rural nonfarm economy. However, the development of rural financial markets has lagged. Their performance has been poor and, in most Asian countries, they are ill-prepared to serve rural areas in the 21st century.
ECONOMIC TRANSFORMATION AND RURAL FINANCIAL MARKETS IN ASIA

The Commercialization of Agriculture

The green revolution fueled the structural transformation of rural areas. The new technologies expanded agricultural production and induced demand for fertilizers, chemicals, and other purchased inputs. Commercialization of production led to the rise in marketable surpluses with increased marketing of agricultural inputs and outputs. Cash incomes rose for many farm households, market exchanges substituted for barter, and the rise in use of money as the medium of exchange helped integrate the rural with the urban economy. In addition, decisions regarding product choice and input use evolved from subsistence to a profit-maximization orientation. Integrated farming systems were often replaced with specialized crop and livestock enterprises. Highly specialized large-scale plantations are now found along with small farms that combine farm and nonfarm enterprises to increase and diversify income sources.

Markets and the Critical Role of Finance

Structural transformation requires markets to facilitate the division of labor in which one producer specializes in one activity and trades with others who have different specializations. Markets integrate specialized producers and consumers so that they can engage in transactions involving an increasingly heterogeneous set of goods and services. As structural transformation progresses, markets for land, labor, capital, and finance emerge, multiply in number, and become more complex in response to the greater variety of goods and services demanded. Markets with varying degrees of efficiency have emerged in the developing market economies of Asia. The transition economies, however, are experiencing difficulties in creating markets and supportive institutions, and this
constrains agriculture from contributing more fully to economic growth.

Financial markets contribute to economic growth. The primary function of the financial system is facilitating resource allocation across space and time in an uncertain environment. Finance is used to reduce risk, allocate resources, monitor managers and exert corporate control, mobilize savings, and exchange goods and services. When these functions are performed well, they contribute to economic growth through two channels: capital accumulation and technological innovation. Limited access to financial services can constrain economic development. For these reasons, governments and donors have devoted vast resources to developing financial systems in low-income countries during the past three decades.

**Policymaker Perceptions about Rural Finance**

In the 1960s and 1970s, many Asian policymakers did not believe that a farmer’s ability to self-finance investments would lead to a socially optimum rate of growth. They perceived that the potential of the green revolution would not be realized unless farmers could access an elastic supply of funds at more reasonable interest rates than available from informal sources. These views provided the rationale for directed and subsidized agricultural credit programs along with strong support for input- and output-marketing projects. The BIMAS project in Indonesia and Masagana 99 in the Philippines are examples; both failed, imposing great losses on the financial institutions that participated in them.

**DEVELOPING RURAL FINANCIAL MARKETS**

**High Costs and Risks in Rural Areas**

The directed-credit approach to supplying agricultural loans did not properly recognize the especially difficult
problems of providing financial services in rural areas. Rural bank clients are more dispersed than urban clients and often demand only small loans and savings accounts, such that per-unit transaction costs are high for the financial institutions. Information costs for providers and users are higher because transportation and communication infrastructure is usually less developed. Agricultural loans are often considered inherently risky because of production and marketing risks, and the returns on farm investments are often low because of urban-oriented agricultural policies. Loan repayment by farmers may be contingent on borrower ability to meet household consumption requirements. Many potential clients have little loan collateral, and property rights to land may be hard to enforce. Although farm households engage in a variety of enterprises, the geographic concentration of crops and livestock results in high covariance of household incomes, which makes returns for local institutions vulnerable to local disasters.

The Changing Paradigm for Developing Rural Financial Markets

The failure of many credit projects led to a paradigm shift in some developing countries. The paradigm of directed and subsidized lending has been gradually replaced by a new one oriented towards financial-market efficiency. The main features of the old and new paradigms are summarized in Box 1. Some Asian countries are using ideas from the new market-oriented paradigm, while others cling to the old directed-credit approach. Evidence of the new thinking is found more often in microfinance than in rural finance policies.

The perspective offered by the changing paradigm is useful for identifying weaknesses in policies and programs in many developing countries. However, it has shortcomings as an analytical tool for determining the nature of specific problems that individual countries face in resolving bottlenecks in their rural financial markets. For example, the issue of an appropriate regulatory and supervisory framework for rural
| Box 1 – Primary Features of the Old and New Paradigms |
|---------------------------------|------------------|------------------------------------------------|
| Features                        | Directed Credit  | Financial Market                                |
|                                 | Paradigm         | Paradigm                                       |
| Problem definition              | Overcomemarket   | Lower risks and transaction                    |
|                                 | imperfections    | costs                                          |
| Role of financial               | Promote new      | Intermediate resources more                    |
| markets                        | technology       | efficiently                                     |
|                                 | Stimulate        |                                               |
|                                 | production       |                                               |
|                                 | Implement State  |                                               |
|                                 | plans            |                                               |
|                                 | Help the poor    |                                               |
| View of users                   | Borrowers as     | Borrowers and depositors as                    |
|                                 | beneficiaries    | clients choosing products                      |
|                                 | selected         |                                               |
|                                 | by targeting     |                                               |
| Subsidies                       | Large subsidies  | Small subsidies                               |
|                                 | through          | Create independent institutions               |
|                                 | interest rates   |                                               |
|                                 | and loan         |                                               |
|                                 | default          |                                               |
|                                 | Create subsidy   |                                               |
|                                 | dependence       |                                               |
| Sources of funds                | Governments and  | Mostly voluntary deposits                     |
|                                 | donors           |                                               |
| Associated information systems  | Designed for     | Designed for management                        |
|                                 | donors           |                                               |
| Sustainability                  | Largely ignored  | A major concern                                |
| Evaluation                      | Credict impact   | Performance of financial                      |
|                                 | on beneficiaries | institutions                                  |
Creating Financial Markets in Transition Economies

Creating sustainable finance in transition economies involves a complex process of rapid transformation from a State-planned to a market-based economy; it means creating new institutions, adapting existing institutions, and dismantling inefficient institutions and overbuilt capacities. The Asian transition countries are heterogeneous. On the one hand, the People’s Republic of China (PRC) and Viet Nam embarked on a gradual transition in the 1980s with microeconomic reforms preceding macroeconomic reforms. The banking sector in the PRC captures rural surpluses for use in financing projects including rural industrialization. On the other hand, the Central Asian republics became independent countries only in the 1990s, and macroeconomic reforms dominated the first phase of transition, which was limited to liberalization of the economy and redistribution of the State-owned assets. The second phase of transition involves creating financial institutions, developing skills, and accumulating knowledge. The situation in the Kyrgyz Republic described in this volume shows how rapid changes in property rights and liberalization of prices and foreign exchange are being implemented. The banking sector is expected to play a role in the privatization strategy.

The transition countries need financial reforms in two major areas. First, they need to improve the efficiency of their banking sectors by reducing bureaucratic interference and overdue loans, unclogging payment systems, strengthening regulatory and supervisory systems, developing legal systems that can enforce contracts and inculcate financial responsibility, reducing corruption, and improving the skill level of the staff to assess and manage risks. Second, they need to reduce systemic problems in their financial markets to increase competition, by reducing insider control of financial institutions, developing capital markets, reducing the political hold on institutions, reducing barter transactions, and reducing barriers to entry for private banks and nonbank financial institutions.
Building Rural Financial Markets

In recent years, financial institutions have been evaluated on the dual objectives of outreach and sustainability. Generally speaking, a financial system meets more of society’s objectives and merits the allocation of scarce resources if it

- serves many clients;
- serves many poor clients;
- provides a large range of services;
- costs the users as little as possible;
- provides services over a long period of time; and
- can be sustained with only a minimum of support from nonusers or taxpayers.

These should be the objectives of the policies and programs for rural financial markets. The priorities for developing rural financial markets form a three-pronged framework: creating the policy environment; building financial infrastructure; and institutional development.

Creating the Policy Environment. Many directed-credit programs were introduced in environments hostile to creating healthy financial markets: macroeconomic instability produced highly variable inflation rates; repressed interest rates prevented charging cost-recovery rates on loans; and high reserve requirements discouraged deposit mobilization. Limits on bank branching and on creating new banks restrained competition among rural financial institutions. Cheap food policies, subsidized food imports, farm price controls, unfavorable agricultural terms of trade, and distorted foreign exchange rates contributed to this negative environment. Policy reforms are necessary to create an environment conducive for financial markets. Some countries may greatly improve their financial systems through systemwide reforms, but in other cases, more direct proactive measures will be required to build the financial infrastructure.

Building Financial Infrastructure. Building financial infrastructure was largely overlooked in the old agricultural
credit paradigm, but it has now emerged as one of the top priorities for improving rural finance. Frequently, it is more important than supporting a specific financial institution because improved infrastructure contributes to the entire financial sector, not just to institutions targeted for direct assistance. Information, legal, and regulatory systems represent parts of the infrastructure that directly affect financial transactions, while transportation and communication systems, particularly in rural areas, indirectly affect the costs and risk of finance.

Institutional Development. Institutions may not develop automatically because of improvements in the environment and financial infrastructure. Institution building may be required in order to take advantage of the newly emerging opportunities and markets. If financial services are to be broadly based, some groups, such as women, small farmers, and microentrepreneurs, may find that they are disadvantaged in responding to market opportunities. Providing support to institutions that target these groups, particularly in their initial start-up phase, may yield high social returns, provided that the subsidies received are for specific institution-building purposes and are transparent, time-bound, and linked to performance. Ultimately, individual institutions need to experiment with alternatives to find methods of operation that fit their objectives and capabilities.

WHAT HAS BEEN LEARNED ABOUT DEVELOPING RURAL FINANCIAL MARKETS IN ASIA?

Learning from Failure

The directed-credit paradigm employed by most Asian countries in the 1960s and 1970s had the following characteristics:
• Interest rates for farm loans were subsidized and loans for small farmers were set at especially low rates.
• The source of funds for most programs was the government and donors. Local savings mobilization was largely ignored.
• The objective of government policy was to increase the supply of loans made to farmers with little attention given to institutional sustainability.
• Production packages, in which credit was treated as an input like seeds and fertilizer, were created for farmers.
• Credit was targeted for "productive purposes." Loans for consumption and rural nonfarm enterprises were ignored and, in some cases, prohibited.
• Credit programs were often aimed at small farmers and employed supervised credit through cooperatives as a means to ensure that it was used properly.
• Cooperatives were the primary credit channels in many countries, while commercial banks and agricultural development banks were more important in other cases.
• Transaction costs for lenders and borrowers were largely ignored.
• Some programs eventually broadened their target groups from small farmers to the rural poor.

The Emergence of New Views

Research conducted on many failed directed-credit projects provided the following conclusions:

• Agricultural credit is not a direct input in agricultural production, but is provided as the result of a process of financial intermediation. Financial services are as important to rural nonfarm enterprises as they are to farming.
• Credit is fungible; it is costly and difficult to target end-use effectively.
• A policy of maintaining positive real interest rates is the most important element in improving rural financial market performance.
• Use of savings to finance loans will diminish or erase patronal relations that currently exist between borrowers, intermediaries, and financial authorities.
• A reduction in dependence on external funds will decrease the politicization of rural financial markets.
• Broadening financial intermediation will increase competition among formal and informal lenders and reduce any monopoly profits that may exist. Informal finance plays an important role in providing savings services and small loans for consumption and emergency purposes.
• The aim of analysis should be to provide a better understanding of the factors affecting the performance of financial institutions, rather than an attempt to measure credit needs or impact at the farm level.
• Reforms in financial market policies are more often blocked by political obstacles than by economic forces.

Lessons from Microfinance for the Poor

Microfinance emerged in the late 1970s and several projects for lending to the poor produced results superior to many of the old-paradigm agricultural credit projects. Microfinance organizations (MFOs) designed important innovations that enabled them to expand the frontier of financial markets in developing countries. These innovations reduced lending costs and risks and permitted MFOs to serve poor clients successfully without the collateral normally required by banks. This experience contributed to the emerging new paradigm. The techniques used by successful MFOs include the following:

• Loan sizes—loans are small in size, made for only a few weeks or months, to be used mostly for working capital purposes.
• Interest rates for farm loans were subsidized and loans for small farmers were set at especially low rates.
• The source of funds for most programs was the government and donors. Local savings mobilization was largely ignored.
• The objective of government policy was to increase the supply of loans made to farmers with little attention given to institutional sustainability.
• Production packages, in which credit was treated as an input like seeds and fertilizer, were created for farmers.
• Credit was targeted for “productive purposes.” Loans for consumption and rural nonfarm enterprises were ignored and, in some cases, prohibited.
• Credit programs were often aimed at small farmers and employed supervised credit through cooperatives as a means to ensure that it was used properly.
• Cooperatives were the primary credit channels in many countries, while commercial banks and agricultural development banks were more important in other cases.
• Transaction costs for lenders and borrowers were largely ignored.
• Some programs eventually broadened their target groups from small farmers to the rural poor.

The Emergence of New Views

Research conducted on many failed directed-credit projects provided the following conclusions:

• Agricultural credit is not a direct input in agricultural production, but is provided as the result of a process of financial intermediation. Financial services are as important to rural nonfarm enterprises as they are to farming.
• Credit is fungible; it is costly and difficult to target end-use effectively.
• A policy of maintaining positive real interest rates is the most important element in improving rural financial market performance.
• Use of savings to finance loans will diminish or erase patronal relations that currently exist between borrowers, intermediaries, and financial authorities.
• A reduction in dependence on external funds will decrease the politicization of rural financial markets.
• Broadening financial intermediation will increase competition among formal and informal lenders and reduce any monopoly profits that may exist. Informal finance plays an important role in providing savings services and small loans for consumption and emergency purposes.
• The aim of analysis should be to provide a better understanding of the factors affecting the performance of financial institutions, rather than an attempt to measure credit needs or impact at the farm level.
• Reforms in financial market policies are more often blocked by political obstacles than by economic forces.

Lessons from Microfinance for the Poor

Microfinance emerged in the late 1970s and several projects for lending to the poor produced results superior to many of the old-paradigm agricultural credit projects. Microfinance organizations (MFOs) designed important innovations that enabled them to expand the frontier of financial markets in developing countries. These innovations reduced lending costs and risks and permitted MFOs to serve poor clients successfully without the collateral normally required by banks. This experience contributed to the emerging new paradigm. The techniques used by successful MFOs include the following:

• Loan sizes—loans are small in size, made for only a few weeks or months, to be used mostly for working capital purposes.
• Repeat loans—incentives are given to clients to maintain good repayment records by rewarding them with (almost automatic) repeat loans. For some lenders, the size of the first and repeat loans is set according to a predetermined formula.
• Loan repayment schedules—frequent payments are required, often weekly or monthly, to enable close monitoring of borrower performance.
• Interest rates—interest rates and fees are high, usually much higher than those charged by conventional lenders, and are usually positive in real terms.
• Loan officer efficiency—loan officers frequently handle 75 to 100 borrower groups or 200 to 500 individual borrowers. Financial incentive schemes for employees stimulate high levels of efficiency.
• Loan collateral—many MFOs use a lending process involving peer group formation and peer monitoring as a substitute for conventional loan collateral to reduce transaction costs and risks. MFOs that use the more conventional individual lending technology accept household goods and other assets with high-use value to their clients as collateral.
• Decentralized lending procedures—the procedures for screening applicants and processing loans are simple, with considerable autonomy given to loan officers, who are required to maintain close contact with their clients.
• Loan delinquencies and losses—MFOs frequently report loan recoveries of 95 percent or more. Computerized systems are often used to produce daily repayment reports so loan officers can take corrective action at the first hint of unexplained delay in their clients’ payments. Some MFOs offer interest rebates for on-time or early repayments, and others charge penalty interest for late payments.
Present Status of Rural Financial Markets in Asia

A surprisingly large number of Asian countries have made relatively little progress in adopting the new paradigm. There are important exceptions, but the primary problems today are similar to those two decades ago:

- Interest rates on rural loans are often too low to cover the costs and risks of lending. Some MFOs charge rates high enough to cover most costs, but regulations and political pressure have kept rates low for many agricultural lenders.
- Many countries have resisted adopting a market approach to rural finance. Targeted programs, subsidized refinance funds, and restrictions on clientele served still exist. The sustainability of financial institutions continues to be a secondary objective.
- Many rural financial institutions are weak and exist only because of subsidies. Nonperforming loans are a serious problem and sap their vitality.
- Savings mobilization is still relatively neglected.
- Policymakers continue to be largely preoccupied with the problems of agriculture and overlook the broader demand for financial services by the rural nonfarm economy.
- Most rural financial institutions are ill-equipped to make long-term loans and to use new information and communications technologies characteristic of modern banking.

Three Successful Rural Financial Institutions in Asia

Three Asian institutions have been extensively studied because their performance has been far superior to most rural financial institutions in the developing world. They are the Bank for Agriculture and Agricultural Cooperatives (BAAC) in Thailand, the unit desa system of Bank Rakyat Indonesia (BRI-UD), and the Grameen Bank (GB) in Bangladesh. The
three have achieved good outreach and sustainability. Outreach refers to the increased degree of market coverage of low-income groups that were previously without access to formal financial services. It includes both a horizontal dimension (breadth of outreach or number of clients served) and vertical dimension (depth or level of poverty of clients). Sustainability refers to the ability of a financial institution to supply financial services on a continuous cost-covering basis without external subsidies. A sustainable institution covers its costs, including operating expenses, loan and inflationary losses, and the cost of funds, without external subsidies. It makes a profit to compensate owners, to accumulate reserves against future losses, and to fund new investments. Subsidy dependence is the inverse of sustainability, and the calculation of a subsidy dependence index (SDI) has been used effectively to evaluate the degree of subsidization received by financial organizations.

All three institutions have millions of clients with loans; BAAC has been the most successful, as it reaches more than 80 percent of the country’s farm families. It has a larger portfolio than the other two because of its larger average loan size. It also performs well in reaching the poor as seen in the relationship between average loan size and the country’s GDP per capita. BAAC and BRI-UD have about the same amount of savings mobilized, but the number of savers is much larger in BRI-UD. Moreover, the total amount of BRI-UD savings far exceeds its loan balance, while BAAC and GB rely on other sources for a significant share of their total lending. Unlike the other two, Grameen does not actively promote voluntary savings, but it is particularly successful in reaching poor women clients with loans. BRI-UD is by far the most profitable institution. In 1995, it could have reduced the yield on its loan portfolio from 31.6 to 16.3 percent and still have remained free of subsidy. BAAC would have had to raise its average yield on loans from 11 to almost 15 percent, and GB would have had to raise its rates from 20 to 33 percent to be free of subsidy.

These institutions show, first, that institutional development requires a long-term commitment because strong
institutions are not created overnight. Second, good institutional design is important, but the policy environment and financial infrastructure are also important. Third, marginal clientele can be reached if the correct approach is used. Fourth, extensive outreach can complement the objective of financial sustainability. Fifth, microfinance is not a panacea; it often serves women better than men, is most cost effective where there is a dense population, and works best with small short-term loans repaid in frequent small installments. Therefore, rural financial institutions cannot meet their objectives by simply mimicking microfinance.

**Problems in Implementing the New Paradigm**

The Asian region faces two sets of problems that must be overcome before it adopts the new financial markets paradigm. First, it is making slower progress in commercializing rural finance and microfinance than Latin America. The causes of this problem include controlled interest rates, influential leaders who do not have a clear vision of developing market-driven financial services, and particular situations, e.g., several countries are in transition; some have frequent natural disasters; some are conflict-affected; some have poor transportation and communication; some have religions opposed to high interest rates; and finally some have huge areas and heterogeneous populations.

The second problem is that several countries were particularly hard-hit by the economic and financial crisis in Asia that began in 1997 and that has set back economic progress, raised questions about the policy of economic liberalization, and created uncertainty about how the financial system, including rural financial institutions, will be regulated in the future.
RECOMMENDATIONS

The experiences of the three institutions mentioned above, along with analyses of other financial institutions, reveal crucial factors that enable them to achieve outreach and sustainability. These factors are presented in terms of the three-pronged framework mentioned above—policy environment, financial infrastructure, and institutional development—and two special challenges for institutional development and donor issues are added.

Creating an Appropriate Policy Environment

Although the urban bias of economic policies in Asian countries has been reduced, several policies influence the prospects for developing sound rural financial markets.

• Interest Rates. Interest rates are controlled in some countries while in others financial institutions are reluctant to raise rates even when they are deregulated. BRI-UD determines its own rates and follows a policy of covering costs. The low-interest-rate policies of BAAC and GB are well intentioned, but the cost of this policy for the institutions is that they cannot become self-sufficient. When some institutions are subsidized, market-oriented institutions cannot compete. This problem is worsening in Indonesia because of special subsidized projects created in the wake of the financial crisis. The freedom to set interest rates is often linked to the freedom to select clients. Subsidized-credit projects usually carry restrictions about the target groups to be served, which implies that the lender ends up with a risky, undiversified portfolio. Financial institutions need the flexibility to set interest rates consistent with costs, risks, and competition.
• **Loan Targeting and Institutional Support.** Financial institutions need the flexibility to select their own clients; if institutions participate in targeted and subsidized projects, the subsidy should be used to strengthen the institution, rather than be passed to borrowers as lower interest rates.

• **Emergency Loans.** Financial institutions are a poor channel through which to allocate subsidized emergency loans to alleviate social and economic crises, because such funds are usually intended to be quickly disbursed without careful attention to client selection, creditworthiness, or recovery enforcement procedures.

• **Institutional Independence and Political Interference.** Countries that desire strong rural financial markets must find ways to shield rural financial institutions from well-intended but detrimental political interference.

### Building Financial Infrastructure

Projects to build public institutions that reduce the cost of financial intermediation may generate high returns because they benefit the entire financial system. Experience has shown that governmental support is vital for two sets of supporting infrastructure:

• **Legal and Regulatory Systems.** Prudential regulatory and supervisory systems need to be strengthened in most countries and the inefficiencies of legal and judicial systems reduced so that contract enforcement is less costly and less time-consuming.

• **Information Systems.** All countries need to review the information systems that support finance, because reducing information costs will lower costs for all financial institutions and drive down interest rates. Some information systems need to be supported by governments because they are public goods. Universal
identification systems are important so that clients of an institution can carry their credit history from one location to another.

Institutional Development

Institutional development requires a commitment by owners and managers to establish good quality and efficient client-oriented services:

- **Client Preference.** Institutions must determine what products and services are demanded. Greater appreciation for client preferences will encourage loan repayment.
- **Autonomy.** Financial institutions require autonomy to adopt the new market-oriented paradigm and to hire well-trained staff, pay high salaries, use incentive systems to motivate efficiency, and decentralize decision making to reduce transaction costs for clients.
- **Efficiency and Costs.** Competition is increasing in some markets, so financial institutions must strive to improve efficiency and reduce the costs of their services. Improved efficiency will also permit charging the lowest possible interest rates and fees consistent with financial sustainability.

Two Special Challenges for Institutional Development

There are two special challenges that need to be dealt with as part of institutional development in several countries:

- **Rehabilitation.** There exist failing or poorly performing agricultural development banks, cooperatives, and credit unions that consume resources and may cause negative spillovers that damage other institutions. They represent a potential resource in the form of installations and staff that could be salvaged. However,
the conditions required for successful rehabilitation are frequently not met. Decisions are required to either close them if that is the best alternative, or rehabilitate them so that they can perform better.

- **MFOs.** Existing MFOs may have the potential to be upgraded to serve the rural market, but this requires institutional strengthening and an appropriate regulatory framework so that they can legally mobilize savings. A decision is needed in countries where they are important to determine which ones have the capacity to expand in rural areas, and to provide support for them to do so.

**Major Issues for Donors**

Donor organizations are in a strategic position to disseminate best practices, encourage the exchange of information, and build a consensus for reforms. They must judiciously determine which situations are conducive to institution building for rural financial institutions, and which are better suited for structural adjustment projects to support policy changes.

**FINANCIAL MARKETS FOR THE TWENTY-FIRST CENTURY**

The rural financial markets in Asia are generally not in a strong position to support modernization of rural economies. Financial dualism appears to be increasing in many countries. Urban financial markets are modernizing at a faster rate than their rural counterparts. Larger farms and agribusinesses obtain financial services from these modern urban financial institutions, while most small farmers and rural nonfarm enterprises must rely largely on savings and informal finance. A digital divide is emerging that separates those using modern computers and communication technologies from those who do not.
Many rural financial institutions are weak and depend on subsidies. They lack professional competence to evaluate credit risks and they operate in environments that are not supportive. Asian agriculture will be at a disadvantage relative to that in other regions and countries with more advanced financial systems. Fortunately, the Asian region has a few good financial institutions that are well advanced and can serve as models for others. Successful microfinance experiences offer insights into how finance can be successfully extended into rural areas. Moreover, several countries have highly trained personnel who could create new technologies and manage institutions if they were given the opportunity, flexibility, and financial support. It is up to the governments in the region to support them. Asian policymakers must do a far better job in the future than they have done in the past three decades in order to create appropriate environments, build financial infrastructure, and develop institutions necessary for strong market-based financial systems to serve rural farm and nonfarm enterprises and households.
Policymakers today have an extraordinary opportunity to secure a bright future for the people of rural Asia, who currently number 2.3 billion, or nearly 40 percent of the total world population. By investing in health, education, and rural infrastructure; by establishing institutions to promote rural economic growth; and by seizing the opportunities presented by a rapidly changing world, they can fulfill the promise of a better life for these people.

This conclusion is based on extensive research on the quality of life (QOL) in rural Asia. This research has multidisciplinary conceptual foundations and incorporates a wide range of real-world analyses, including cross-country comparisons, household survey data, focus groups of rural women and men in several countries, case studies, and literature review. On the basis of this research, there are five main messages:

- The QOL is a much broader concept than income per capita, which is the standard indicator of a population’s stage of development. QOL, which is the proper focus of the development process, has many components, most of which are linked and tend to be mutually reinforcing. The QOL perspective suggests
that a range of powerful instruments for rural development is available that extend beyond the conventional, but undeniably important, measures designed to promote agricultural productivity.

- Rural Asia has made great strides in terms of QOL in recent decades, but much remains to be done. Despite rapid population growth, rural Asians have, on average, enjoyed higher incomes, greater longevity, better health, and improved education. However, huge pockets of abject poverty persist. Hundreds of millions of people lack access to sanitation, safe water, or health services; stunting, wasting, and social and physical insecurity are prevalent in many parts of the region. Extreme gender inequality, which takes myriad forms including denying women access to health care, education, and jobs; physical and psychological abuse of women; and female infanticide, selective abortion, and nutritional deprivation also characterize many parts of rural Asia, especially South Asia.

- The challenge of improving QOL is not insurmountable. Compelling evidence indicates that QOL benefits directly from increasing social spending on health, education, and nutrition; developing rural infrastructure and financial institutions; promoting the involvement of rural people in the political process; and, perhaps most important, improving the status of women. The evidence also suggests the existence of powerful synergies among these policy initiatives, whose implementation is no less important than their design.

- The wisdom and appropriateness of past policies and programs must be examined in light of a new and uncertain future. Many traditional determinants of rural QOL, such as population growth, will operate with a different intensity. In addition, potent new influences, such as the emergence of many highly effective NGOs, a dramatic increase in the elderly share of the population, and the HIV/AIDS epidemic,
are appearing on the scene. The broad context within which rural development must occur is also undergoing fundamental change because of, for example, globalization, democratization, technological change, and the knowledge revolution.

- Rural Asia faces four particularly strong challenges related to poverty, aging, globalization, and gender equity, respectively. Policymakers must give priority to poverty alleviation and focus on both agriculture and other sectors. This is particularly important because demographic trends project a future increase in the proportion of the population that is of working age. If countries do not absorb these additions to the work force into productive employment, the ranks of the socially excluded will swell. Political instability could also result. As the population ages, a second challenge will gradually emerge, which is providing old age security. Addressing that challenge requires creating new institutions now, with the recognition that changing them later as the elderly share of the population grows may be politically infeasible. Third, as globalization proceeds, policymakers will need to ensure that the rural sector is not left behind and will be protected from new risks. Finally, achieving gender equity is crucial to enhancing the QOL, both directly for girls and women, and indirectly through the contributions they make to well-being at all levels of rural society.

THE GOAL OF DEVELOPMENT

The goal of development is to improve people’s lives in ways that are efficient and sustainable. The QOL perspective focuses on the many factors that influence the ability of individuals, families, and communities to lead fulfilling lives. One of the most important of these factors is income. Not only
does increased income make people better able to free themselves from basic wants such as food or shelter, but it also expands their choices about how they will live their lives. However, income is only part of the story. Whether people are healthy and whether they can develop their innate capacities through education also matter. At the aggregate level, health and education levels are not completely determined by income. Some countries exhibit relatively high levels of education and health status despite being poor, while some wealthy nations have relatively low levels of health and education. This indicates that what countries do with the wealth they have, that is, what policy choices they make, are a crucial determinant of QOL.

QOL is also to some extent a moving target in the sense that the results of development define subsequent perceptions of what constitutes achievable QOL goals. In addition, new circumstances may reveal new QOL concerns. For example, as countries become wealthier through industrialization, pollution becomes an issue for the QOL of their inhabitants. We also argue that people’s ability to influence their lives by participating in the decisions that affect them is another aspect of QOL.

The argument put forward here is that QOL is not a series of unrelated but desirable outcomes, but rather that QOL depends on interlinked processes. Certainly, income, health, and education by themselves have direct, positive effects on QOL. However, they are also interrelated. The most commonly perceived link at the individual level may be that between education and income: increases in education lead to increases in income, all else being equal. However, increases in income also tend to raise education levels, because governments and individuals have more money to invest in education. Similarly, health and education are associated, and the links between the two are important. Poor nutrition also slows cognitive development and is related to poor performance in school. There are also links between political participation and other QOL determinants. People who are more educated tend to feel less exploited and powerless in their interactions in the
public sphere and have a greater sense of being able to influence decisions that affect their communities. Income levels also seem to affect participation, because higher income levels are associated with higher social status and greater political awareness.

In addition to the various components of QOL, the links among those components also deserve attention as they are crucial in determining the effects of different policy interventions. While standard cost-benefit analyses take the direct impact of policy interventions into account, their interlinkages imply that directed investment in areas with feedback effects, such as health and human capital, can have large impacts on the overall QOL. Specifically, these interlinkages point to a crucial policy issue: the possibility of taking advantage of multiplier effects through relatively small, but targeted, investments in such areas as education and health. The goal of such investments is to produce virtuous cycles of increasing QOL. Better educated populations are healthier, more productive, and wealthier. As they go on to acquire more education and better health, an upward spiral of improvement is generated. Policymakers should also note that this process can operate in reverse. Failure to invest in people prevents them from escaping a trap in which poor education, poor health, and poverty reinforce each other.

QUALITY OF LIFE ACHIEVEMENTS AND CONTINUING GAPS IN RURAL ASIA

In most countries in Asia, as in the rest of the world generally, QOL tends to be lower in rural areas than in urban areas. Lower school enrollment rates, higher infant mortality, lower life expectancy, and lower wages all contribute to the discrepancies rural inhabitants experience. Although progress in improving rural QOL has been relatively slow, the fact that most QOL indicators for rural Asia have not deteriorated in the face of rapid population increase is a major achievement.
Two facts are especially noteworthy: First, rural-urban disparities in income per capita tended to increase between 1970 and 1995. Second, the Human Development Index, which embodies education levels and longevity in addition to income, exhibited a larger increase in the more rural Asian countries. These findings indicate that the combination of improvements in rural life expectancy and human capital acquisition (mainly the expansion of primary education) outweighed rural Asia’s relative income decline. Insofar as standard analyses of income per capita support fundamentally different conclusions than the more encompassing measures of QOL, these results provide a powerful justification for adopting a broad QOL perspective.

These changes were taking place at a time of great demographic shifts. In 1970, 1.5 billion people lived in rural Asia, representing 45 percent of the world’s total population and 78 percent of Asia’s population. Because of rapid urbanization, by 1995 the dominance of Asia’s rural population had declined to 39 percent of the world’s population and 68 percent of Asia’s population. During the same period, notwithstanding this decline in its relative size, the population of rural Asia increased by nearly 600 million people. This population boom imposed enormous pressure on living standards in rural Asia in terms of competition for resources. In essence, rural Asia has been struggling to climb a series of descending escalators. In light of these pressures, especially the need to provide services and livelihoods for many more people, the gains made in schooling, life expectancy, increased access to health care, etc., in the last quarter of a century are impressive. In terms of QOL, rural Asia has also fared well compared with rural populations in other developing regions.

At the same time, the absolute QOL shortcomings in rural Asia, as well as the persisting gaps between rural and urban Asia, should be cause for concern by policymakers. Nearly 0.5 billion rural Asians, especially in South Asia, lack access to safe water and to health services. To put this figure in perspective, it is approximately equal to the entire population of Latin America in 1995. Even more daunting, the estimates also suggest that some 1.76 billion rural Asians, primarily in
the People’s Republic of China (PRC) and South Asia, lack access to sanitation facilities. Access to basic services is especially high in Central Asia, mainly because the newly independent states have high rates of access dating back to when they were part of the former Soviet Union.

Country-specific rural-urban comparisons of various QOL indicators highlight important rural deficiencies. For example, in many Asian nations educational indicators reveal the marked superiority of urban areas: in Bangladesh the urban literacy rate of roughly 60 percent is double that in rural areas; in Nepal almost half of urban 10- to 14-year-olds are enrolled in school compared with barely a quarter in rural areas; while in the PRC the mean gap in rural-urban educational achievement is 4.6 years, a difference that has remained constant for two decades. In reality, the gap in achievement is probably worse than indicated by these statistics because they do not take the rural-urban quality gap into account. Quality issues are a significant problem in rural areas, where the population’s geographic dispersion and relative isolation makes access to well-educated, trained teachers particularly difficult.

The inherent difficulties in providing high-quality educational services to rural areas indicate the need for new and innovative approaches. For instance, building links with local NGOs can enable governments to involve communities in the education process, thereby enhancing both the demand for and the supply of high-quality education. Note that the provision of educational services is fundamentally a State responsibility, and should by no means be left to NGOs. However, these organizations are often in a position to improve the level of services the government provides.

The differences in health between urban and rural areas are also striking. Even though Asia has achieved dramatic increases in life expectancy, where statistics are broken down by urban and rural residence, the disadvantage of rural inhabitants in terms of their life chances are evident. In the rural province of West Nusa Tenggara, Indonesia, for example, life expectancy is ten years lower than the national average, while rural Indians can expect to live about seven years less
than their urban counterparts. Rural Asians also face a gap in health care access, as exemplified by the proportion of births that are attended by doctors. Rural women are much less likely to have access to trained personnel when they deliver their children than their urban sisters. In terms of their reproductive health, rural women also have less access to family planning and reproductive health services. While many Asian countries have successfully provided access to such services in urban areas, this has been harder to achieve in rural areas, where populations are more dispersed.

The situation of rural Asian women points to the paramount importance of gender in an examination of QOL because it raises the question: Whose quality of life? For many, being female and living in rural areas is a double burden. Indeed, in many Asian nations the gender gap in schooling, literacy, health, social participation, and wages is driven by the rural sector. For example, in Nepal, while urban boys aged 15 to 19 outnumber their female counterparts in school enrollment (45 percent versus 32 percent), the gap is much more pronounced in rural areas (25 percent compared with 6 percent). In India urban women can expect to live about three years longer than men, but there is no difference in rural life expectancies by gender. In countries such as Nepal, Sri Lanka, and Thailand rural women are much more likely to be unpaid family workers than urban women. In many countries the combination of high female involvement in agriculture in rural areas and the large gender gap in agricultural wages because of gender-typing of jobs puts rural women at a disadvantage. In the Philippines, while the gender pay gap in urban areas has fallen during the last two decades, it has remained constant for rural women. These examples demonstrate that gender gaps in core QOL indicators are larger in rural Asia than in urban Asia.

Policymakers have a number of strategies and instruments at their disposal to help close some of the QOL gaps outlined here. One strategy is to expand the partners with whom governments work to provide or deliver QOL-enhancing services. In many Asian countries, NGOs have
emerged as vital sources of information and ideas, builders of social capital at a decentralized level, and effective deliverers of services that address basic needs. Notwithstanding the irritation NGOs sometimes cause because of the advocacy tools they employ and their occasionally strong political orientation, there is now ample evidence that NGOs are simply better than governments at performing certain functions that the private sector does not have the incentives to undertake. For this reason, it would be worthwhile for many Asian governments to review their public policies toward NGOs, with a view to liberalizing them. International donors can also play an important role in creating opportunities for NGOs to demonstrate their value.

Decentralization is another strategy and is one that has many advocates in the development-policy community. The benefits reside in allowing those who most are affected by decisions to have a greater voice in making them, which promotes participation and can result in greater efficiency by allowing people to make investments in what they most need. In the long run, decentralization should also contribute to greater local capacity to plan, manage, and implement policies. There are some drawbacks that policymakers should attempt to minimize. Specifically, fiscal decentralization may exacerbate regional inequalities; the inability of small communities to raise sufficient funds to provide services suggests that in many instances, local management, combined with financing from the central government, may make the most sense. In addition, understanding that short-run problems are likely to occur because of the lack of local capacity is important and should not be taken as evidence of failure. Rather, designing decentralization initiatives that take this into account and build in mechanisms to overcome it are indispensable.

To overcome many QOL gaps, policymakers also have some specific instruments at their disposal. The problem of lack of income can be tackled by expanding microcredit programs, in particular, by encouraging the private and non-profit sectors to make loans, using established examples of successful programs as their guide. Although many successful
programs concentrate on loans related to agricultural production, developing loan schemes for nonagricultural purposes, including community infrastructure, is important as well. Land reform programs are also a potential tool. Because the structure of landholding is so closely linked to poverty, implementing legal reforms and creating incentives to lead to more equitable landholding patterns is an option for improving QOL. Changing regulatory structures to secure equal inheritance and ownership rights for women is crucial, although achieving broader redistribution or structural change through regulation appears to be more difficult. Achieving some amount of redistribution through the use of progressive taxation should also be possible. Other policies, such as ensuring access to credit at reasonable interest rates, can enable some landless people to purchase land and break out of the cycle of poverty.

Targeted social spending is another instrument available to policymakers. Because women’s education is so strongly linked to positive QOL outcomes for themselves and their families, where schooling gaps between men and women exist, more resources need to be devoted to educating girls. This may mean hiring more female teachers (because in some areas, parents are hesitant to send girls to schools with male teachers) or subsidizing families to keep their daughters in school. Similarly, women’s health initiatives have a large social payoff in terms of overall QOL. All over rural Asia, reproductive health services lag behind those in urban areas, and the unmet need for family planning is generally higher. Closing these gaps is an important investment in creating a virtuous cycle of enhanced QOL.

Infrastructure investment, particularly for roads, electricity, telecommunications, and provision of safe water, is also a key area for investment. In many cases, however, rather than direct government provision of such infrastructure, a preferable role for the State might involve creating incentives for private provision. Especially important is dismantling State monopolies and cutting inappropriate taxes on infrastructure goods and services.
QUALITY OF LIFE CHALLENGES FOR RURAL ASIA

Remedying rural Asia’s longstanding QOL deficiencies is not the only task for policymakers. They will also be confronted by new situations and will need to develop plans to set and meet new priorities. These may be the most important challenges the region faces to achieving a higher QOL as it heads into the next century. Ensuring that the promise of rural Asia is not broken means that policymakers must make a commitment to meeting these challenges.

Poverty Reduction

Perhaps the most crucial area for improving QOL in rural Asia is poverty reduction, which is linked to better provision of services and improved individual well-being. Achieving this demands a multipronged strategy that focuses on increasing productivity in all sectors, creating more jobs, investing in human capital, and promoting good management of the challenges posed by ongoing demographic changes. Devising strategies to raise productivity in agriculture, and especially in rural manufacturing and services as agriculture comes to occupy a less important position in the rural economy, is a key means of rural poverty reduction, as is absorbing labor in those sectors. The relative expansion of the working-age population during the next several decades is a demographic gift that can help achieve growth and alleviate poverty, but only if productivity and employment increase to absorb this population. Social safety nets are also needed to alleviate the suffering associated with both episodic and chronic spells of poverty.
Old-Age Security

The expansion of the working-age population, combined with lower mortality rates, points to another major challenge facing rural Asia in the future. As this group of people ages, the issue of the old-age dependency burden will begin to surface. This has the potential to have a negative effect on economic growth unless families and governments begin to prepare for it now. While observers often see the Asian family as a force promoting social stability and as a provider of social welfare for its members, demographic change is likely to strain this traditional institution. The costs of caring for the old are likely to rise as working individuals have fewer siblings with whom to share the financial burden, which may weaken the traditional arrangement between the generations to provide care. Migration, the growth of the mass media, and urbanization may also promote cultural change, especially the formation of nontraditional attitudes such as individualism, which may also lead to a weakening of the family welfare system. Under this scenario, rural Asia faces the daunting prospect of significant unmet need for the care of its elderly.

The aging of the population and declining mortality and morbidity mean growing numbers of the “oldest old,” often defined as those older than 75 or 80. This period of life is associated with decreasing functionality and mobility and greater dependence. The need for local services is especially acute for this population, because their limited mobility means they are less able to travel long distances to access services. In addition, because their children are likely to be elderly themselves, they will have fewer economic resources from current earnings and a diminished ability to care for their aged relatives.

These changes point to two major policy challenges: providing income and services for the old in the future. Savings and pension systems must be developed now to address the need for future income for the elderly, although to do so policymakers need to overcome some problems. In rural Asia, providers of credit such as NGOs and other microcredit
organizations have typically not mobilized savings. This means that incentives and capacity building for managing deposits need to be created. Financial market controls would help to ensure the soundness of most pension systems, strengthening an already overwhelmingly strong set of arguments in favor of such controls. The second challenge is providing services, especially medical care. The rural health care system will need to be retooled to some extent. Village health workers and NGO staff, who tend to focus on children’s and reproductive health, will need to be trained in geriatric medicine. Decisions about health care services, such as where to locate them, and priorities will also be affected by the needs of an aging population.

Globalization

Another major challenge facing rural Asia is the globalization of the world economy, as trade grows and movements of capital and labor across national and international borders increase. The integration of the rural economy into the global economy is increasing in the agriculture sector as farmers grow traditional food crops for the world market or shift into cash crops. Such integration is positive for the rural sector, because this type of diversification carries with it the potential for higher incomes. At the same time, however, there is greater risk associated with the possibility of shocks occurring in the global economy, for instance, the ongoing Asian financial and economic crisis.

Because global integration is likely to continue, policymakers need to consider ways to protect their economies from the negative aspects of globalization, which means, among other things, spreading risks, both across individuals and over time. One way to diversify risk over time is to encourage saving, which helps individuals and communities weather economic shocks and loss of income. At the same time, however, as a means of diversifying risk, local or regional efforts tend to be inadequate. Crop failures, natural disasters, or even regional economic crises are likely to overwhelm local
savings institutions because they affect all members at the same time. One solution could be to create international insurance mechanisms. Transnational policymakers, such as the Association for Southeast Asian Nations, need to consider creating insurance-based safety nets that operate across large regions or continent-wide. Doing so would mitigate the risks of globalization and lessen the burden on areas hardest hit by shocks.

In an era of globalization, forward-looking policymakers must also consider such QOL issues as labor standards and free markets. Like a social safety net, labor standards are best dealt with across countries rather than within individual nations, because the lack of common standards may promote a race-to-the-bottom dynamic, whereby all countries lower their standards in order to compete in the international trade arena. In addition, workers may be uninformed about the long-term risks that their work entails, and therefore be unable to make good choices about where to work. Even if they understand the health and safety risks, in the absence of other jobs they may have no alternatives. International labor standards can help address this problem, although ensuring that the social benefits exceed the social costs of the regulations is important. Promoting freer markets, while not specifically a rural issue, would benefit the rural sector. In this respect, the continued barriers to capital mobility and lack of openness are problems that many Asian nations need to address. In terms of issues and policies linked to economic openness, such as tariffs and quotas, hidden import barriers, and capital controls, most developing Asian nations fare extremely poorly compared with more developed economies.

**Gender Equity**

Finally, one of the most formidable challenges facing rural Asia involves overcoming strong and persistent gender inequalities, especially in South Asia. Improving women’s QOL will have a multiplier effect for society as a whole. Increasing women’s education not only raises their own QOL, but also
the QOL of other family members. For example, women’s schooling has a greater positive impact on family health than men’s schooling, because of women’s roles as mothers, wives, and daughters-in-law. Similarly, mothers’ level of educational achievement (which has a higher impact on children’s school performance than their fathers’ level) may eventually translate into higher wages for children when they enter the workforce.

By targeting programs and policies to women, lower fertility can also be achieved, which is important for improving rural QOL. Higher rural fertility is partly explained by poor access to education and the lack of job opportunities for women in rural areas. Increasing educational opportunities for girls by providing better access to schools and implementing such policies as compulsory school attendance or providing scholarships for girls can therefore have long-term demographic benefits. Creating labor market opportunities for women will also make children more costly, as they raise the value of women’s time. Microcredit programs that lend primarily to women, such as the Grameen Bank or the Bangladesh Rural Advancement Committee, can therefore bring down fertility rates, not only directly by transmitting their social message that small families are desirable, but also indirectly by providing women with job opportunities.

CONCLUSION

As policymakers working on rural Asia chart a course to the next century, they face a bright future, but must also navigate rocky shoals and uncharted waters. The uncertainty lies in fundamental shifts that are taking place in both the nature of rural life and in ideas about how to improve it. Given the ongoing demographic, cultural, and political changes taking place in rural Asia, the past can provide only limited guidance for future action.

The future focus must be on the centrality of QOL as the goal of rural development. The older vision of improved
agricultural productivity and income growth being the dominant pathway to improving QOL no longer makes sense in light of the determinants of economic growth and of QOL presented in this study. It fails to recognize the myriad of non-income factors that influence QOL and also neglects the stimulus to economic growth provided by QOL improvements. A recognition of this calls for policymakers to rethink their strategies for growth, in which attention to gender equity and better health and education must figure prominently.

At the same time, the context within which decisions are made is changing. Demographic trends reveal a new set of needs and priorities that policymakers cannot ignore. The decision-making environment is also increasingly characterized by the global trends of democratization and decentralization. These trends almost certainly mean that pressures for greater accountability are likely to grow and governments will have to pay more attention to QOL. New social actors such as NGOs are likely to have a larger voice, and policymakers need to learn how to benefit from their experience and effectively work with them, rather than view them as adversaries whose recommendations need to be resisted. Globalization and technological change also bring with them new possibilities for rural development.

Policymakers face enormous challenges in adapting to rural Asia’s new needs and possibilities. There is tremendous promise for the future of the region, but considerable peril as well. What has been highlighted here are some of the likely directions and prominent influences and their QOL implications. Clearly, the new challenges associated with the development of rural Asia call for new strategies. Devising these in an open and rational way that addresses ever important social and political realities is the key to unleashing the promise of rural Asia and securing it a bright future.
APPENDIX 6

THE EVOLVING ROLES OF STATE, PRIVATE, AND LOCAL ACTORS IN RURAL ASIA—SUMMARY

Ammar Siamwalla
With contributions by Alex Brillantes, Somsak Chunharas, Colin MacAndrews, Andrew MacIntyre, and Frederick Roche

This volume reviews the evolution of paradigms and practices since the late 1970s with respect to the roles of the State and the public sector in rural development. A specific objective is to identify areas of future comparative advantage, both for the State and for the more recent additions to the cast of actors in rural development: local governments, communities, community-based organizations, nongovernment organizations, and the private sector itself. In general, the volume takes the perspective that, from the standpoints of the efficiency and quality of the goods and services provided, rural productive activities should be privatized and localized wherever possible. Hence, a second objective is to assess what the residual roles of the State should be in order to create and sustain an appropriate enabling environment that is consistent with the objectives of efficient growth, equity, and environmental sustainability.

Most of the economic development literature and practice through the 1960s assumed as a matter of course that central
governments would plan, initiate, and finance economic development and that the role of the countryside was mainly extractive, i.e., it would provide wage goods (cheap food), surplus labor, and taxes to support urban-based development. As the lead actor in development, the central Government had a clear role: it would deliver development to the people. For this task, it was provided with considerable financial and technical backing from the donors. While the approach had its successes, it also had many hard lessons, the main one being that by the early 1970s there had been little materialization of the widespread improvements in living standards and human welfare that the word development ought to imply.

Then, in the early 1970s, there came a nexus of crisis and opportunity. Because of bad weather and international politics, world foodgrain and energy prices skyrocketed. In agriculture, the green revolution came to the rescue to transform the agrarian scene in much of Asia. Composed of a simple package of inputs—seed, fertilizer, and water, with a dash of pesticide and credit—the green revolution technology readily lent itself to top-down dissemination, thus constituting history’s greatest success story of government-led agricultural growth. It was only with the coming of the green revolution that economists and planners began to recognize the contributions of a progressive agriculture sector to overall economic growth. Because much greater food security was for the first time within reach, and using the opportunities opened by this technology, governments abandoned the extractive approach and, as never before, lavished resources on the rural areas in the form of subsidies to fertilizer, irrigation, and other inputs.

But it was also evident by the 1980s that Asia’s less favored agricultural regions had been largely bypassed by the green revolution. By the early 1990s, the top-down, one-size-fits-all approach to agricultural research and extension had run out of steam. Rates of growth of foodgrain yields were declining, while the difference between experimental yields and yields on Asia’s best farms had greatly narrowed. Moreover, increasingly prominent, at least in the eyes of the donors, were
the concerns about environmental sustainability, bypassed regions, disadvantaged socioeconomic groups, and the sustainability of costly development interventions in agriculture.

A second set of equally profound trends emerged in the late 1980s. The Asian miracle of export-oriented industrial growth began to transform the urban areas of East and Southeast Asia. This development was led by the private sector, but supported both by state-financed infrastructure and, from the late 1980s, by the widespread progress that governments had achieved in macroeconomic stabilization and in liberalizing investment and capital markets. The secular decline in agriculture’s share of national income accelerated. The share of government expenditure in GDP also began to fall gradually—faster in some of the transitional economies—in part because of urban-industrial growth and in part because of austerity in state budgets. The Asian economic crisis commenced in 1997, and has, for the time being, arrested these trends. The crisis has provoked new thinking about the roles of the State as a promoter of development, as the main macroeconomic stabilizer, and as the provider of good governance.

THEMES AND ISSUES

Background to the Evolving Paradigms and Practices of Rural Development

This section sets the stage for the book’s arguments by describing the principal sources of rural dynamism. The first of these, the dynamics of agriculture and food supply, includes the fact that while food security, especially in cereals, is not the urgent concern it was 20 years ago, thanks to the green revolution and the subsequent growth of agricultural productivity and rural incomes, foodgrain supplies must continue to increase 1.5 percent annually for the next 25 years.
in order to maintain that security. This at a time when the green-revolution model of state-led agricultural development is running out of steam and its inadequacy in rainfed and less favored areas has become obvious, when agriculture’s share of GDP and hence relative economic importance is declining, and when poverty alleviation has risen in governments’ priorities and agriculture’s strategic role in achieving it is belatedly being recognized. The State will need to reconsider its priorities and comparative advantages in the agricultural sector, first recognizing that agriculture is fundamentally unyielding to direct state planning and control, being determined more by incentives than by fiat. Creating an appropriate incentive and regulatory structure to encourage private-sector investment and sustainable, market-led growth and focusing direct public interventions more on bypassed regions and disadvantaged groups in the population are likely to be the State’s major new challenges.

The green revolution, growing rural incomes, and urban-industrial growth linkages have led to rural nonfarm development, comprising mostly nontradables produced by households and microenterprises. The phenomenon has been almost entirely led by the market; state efforts to promote rural industrialization have largely failed. The State’s provision of infrastructure—roads, electric power and telecommunications—and rural education to provide local people with the tools to take advantage of rural nonfarm opportunities has been and is likely to remain its major role in facilitating such growth.

Factors in the macro and global environment include the provision by the State of basic macroeconomic stability. Since the 1980s, there has been a nearly universal liberalization of markets and in the 1990s, an increasing economic interdependence engendered by globalization. These large trends, plus the chaos and uncertainty arising from the Asian financial and economic crisis that began in 1997, have made macroeconomic stability a more difficult achievement and have prompted a rethinking of the State’s roles in managing capital and financial markets, in providing social safety nets, and, more fundamentally, in providing good governance.
Development has engendered profound demographic, social, and political developments, including rapid urbanization, greater labor mobility, and the dissolution of traditional family and community institutions and cohesiveness. It has also led to a decline in human fertility that is positively correlated with the rates of economic growth, urbanization, and social development (as measured by infant mortality, education, and female labor-force participation), but that has not yet, because of the momentum of the young age distribution, led to an actual decline in population. Political institutions have also changed, though less widely: democratic institutions and more competitive politics have attained seeming permanence in many countries. The human rights movement has added to the impetus for greater openness and accountability and sometimes contributed to grudging, but ultimately meaningful, political change.

Finally, the Asian financial and economic crisis that began in 1997 has arrested growth in much of the region, with ripple effects that were felt around the world. The crisis created strains on the rural economies as they were forced to absorb workers displaced from urban employment. It resulted in depreciated exchange rates that have given a boost to agricultural production, exports, and employment. It restricted even more than previously the resources available for investment in agriculture and rural development. Finally, it eroded confidence in government and intensified attention to four principles that are now accepted—among many donors at least—as building blocks of good governance: accountability, participation, predictability, and transparency. Although the crisis may provide a pause, the relative economic role of agriculture will continue to decline, but the sector will remain strategically important, particularly in lower-income, slower-growing countries.
Roles and Actors in the Provision of Rural Goods and Services

With the demise of the assumption that the central Government plays the paramount role in setting policies for agriculture and rural development, new players have emerged and are becoming more active in shaping these policies in Asian societies. This section sets out various types of collective action, or functions, required for rural development and then describes the actors, or institutions, that serve as instruments for the delivery of these requirements.

For a rural economy to function and develop there must be goods and services of several kinds. Public goods are those that are nonrivalrous (what one person consumes does not subtract from what is available to others to consume) and nonexcludable (if the goods are produced, it is impossible to prevent people from consuming them). Sanitation services are an example of a pure public good. Local public goods are those whose nonrivalry and nonexcludability impact only a limited geographical area. Private goods and services are those we commonly refer to, comprising three-fifths of an economy’s resources. In addition, there are merit goods, which are those deemed too important to be limited by the size of a person’s or household’s income; these may include food, health services and education.

A second requirement is macroeconomic stability—a function seemingly far removed from rural areas and clearly a task to be performed by the central Government, but important because of the need to keep real exchange rate variations within bounds and thus maintain decent terms of trade for agricultural products.

A third requirement is the reduction of poverty and other “social justice” concerns, which are connected with the provision of the merit goods described above because of the inability of many Asian households to meet their own basic needs. These concerns provide a rationale for state intervention in otherwise private economic and social activities.

Finally, there is the requirement of providing rules and
rights, especially property rights, to limit people’s behavior with regard to the resources of rural areas. Some of these are covered by the country’s legal system; others evolve from rules adopted by local communities about access to forests or allocation of water. Property rights assigning control of an asset to an individual or community involve state property rights, private property rights, common property rights or open-access resources, and communal property rights. All these are especially important in rural Asia, where property rights in land that have legal clarity and are properly enforced are still rare, even in market economies.

Attention then turns to a taxonomy of the various institutions and actors in rural development, beginning with central governments in all their many forms and their constituent parts, politicians and bureaucrats. Politicians, and especially national political leaders, are an immensely diverse lot, so this discussion focuses on two major types: those whose countries have little political competition—the People’s Republic of China (PRC), to take the most notable example—and who don’t have to worry about being reelected; and those who are constrained by the need to win votes; India provides an example of the second type. Whether running for office or not, though, politicians have found themselves having to mobilize the rural population in a show of support for the regime. In all countries except the PRC, which erased and refashioned the traditional rural social structure, this has meant accepting the existing social structure and relying on the traditional rural elites to deliver political support. This has also meant that the great mass of rural people have remained largely unmobilized in most of Asia, since rural politicians have preferred patronage politics to policies that actually aid rural development or poverty alleviation, such as land reform.

Bureaucrats also have great influence on what happens in rural areas, but as a rule, over time, they have become less and less well paid, less and less competent, and more and more corrupt. It is little wonder that governments are becoming less capable of undertaking and implementing rational policies in the countryside.
Local governments, meaning mostly villages, may be best equipped to carry out many of the requirements of rural development, but have played only a small role, partly because governments rarely have personnel other than teachers in local communities and those are given little power and few resources to undertake any serious collective tasks, despite much talk of devolving power to them. Villages sometimes take collective action upon themselves, especially if they possess “social capital,” a form of social cohesion that derives from past interaction in carrying out communal activities. The other intervening layers of government—district, region, province, state—have even less social wherewithal to carry out rural development activities than villages.

Nongovernment organizations vary in the scope of their operations in rural areas, but almost all of them evolved from charitable organizations, usually with a religious orientation. They are closer to the poor than the other actors discussed here and their stance tends to be politically radical. Because of their ideology, their relations with governments tend to be prickly. While their performance in rural development is often more cost-effective than that of governments, they are not automatically more cost-effective, and their claim that they reach the poorest of the poor is not borne out.

The for-profit private sector in rural development, including business corporations and rural nonfarm activities by farm families themselves, can only function within an established legal framework; the recent Asian economic crisis has shown that laws with respect to private-sector institutions are outmoded and need reform. The township and village enterprises (TVEs) that have grown so spectacularly in rural areas of the PRC and that have contributed greatly to rural welfare and strengthened local governments by providing them with resources for social investment and rural infrastructure projects are often cited as models for other parts of Asia. But their development is associated with features unique to the PRC, including the immobility of the rural population and the lack of a private sector.

Finally, multilateral lending agencies, notably the Asian
Development Bank and the World Bank, are of considerable importance in Asian rural development, both as a source of finance and also as a source of policy thinking and even influence on policy choices. Lending decisions reflect the influence of vested interests in the donor countries as well as current economic and development thinking in their capitals. Unfortunately, loans to agriculture, traditionally dominated by irrigation projects, have not performed as well as loans to “harder” sectors.

Devolution and Decentralization: Individual Country Experiences

Devolution and decentralization of public administration have become much-discussed goals and processes in many Asian countries in the past two decades. While the concept is not new, the forces motivating decentralization today reflect new factors that have emerged in recent years, including the impact of globalization, especially the improved access to information by more people, even in remote rural areas; the greatly changed economic and social context brought about by liberalization, privatization, and other market reforms; and the growing social and political demands for voice and autonomy. The changed priorities of donors, including a new willingness to support better governance and accommodate local participation and autonomy, have also helped make decentralization a popular option for rural development.

Decentralization, encompassing the transfer of both administrative and financial authority, is now happening in many countries. While it is no panacea—indeed it can prove destabilizing, leading to loss of control by central governments over the macroeconomy and exacerbating regional disparities—if properly planned and managed, decentralization can bring substantial benefits: it can strengthen the overall capabilities of government, better match the provision of government services against local needs, more effectively support and utilize the local economy, bring government closer to people, and,
through participation, create more responsive and hopefully more capable systems of government.

The prerequisites for successful decentralization include the following:

- first and foremost, full political will—unfortunately expressed more often in rhetoric than in action;
- eschewal of procrastination: the difficulties inherent in such a complex and location-specific process should not be used as an excuse for inaction by central governments;
- full participation and consultation by and among all stakeholders, involving NGOs and the private sector;
- clarity and precision in enactments and in the devolution of responsibilities;
- political as well as administrative and financial transfer of functions; and
- adequate financial support and capacity building.

The experiences of decentralization in three Asian countries—Indonesia, the Philippines, and the PRC—are examined, with particular emphasis on the effectiveness of decentralized services related to rural development. The case studies show how the process of decentralization has been shaped by the different political, social, and physical circumstances of each country.

Indonesia, reflecting strong political pressures, is rapidly moving forward to decentralize its government system. It has a history of revising its institutional arrangements by bringing in broad legislation and slowly, over a long period, allocating the necessary resources to bring about full implementation. Its present decentralization policy has its dangers: if not well implemented and funded it could fragment the country’s present fragile unity. During implementation, time must be allowed so that clear relationships can be established between the various levels of government and ways worked out to meet the significant differences, whether economic, social, or political, between different areas.
The Philippines has also gone some way in the past ten years in decentralizing selected central government functions to the local level, especially to local governments, that have helped them respond to the unique needs and demands of their very diverse localities. Coordination between levels of government has also improved. There are still a number of problem areas, including slow financial devolution, the perceived lack of capabilities of local government officials, and the strong resistance of central government bureaucrats to transfer to remote areas; but the political impetus for devolution remains and decentralization should continue towards full implementation.

The PRC’s decentralization over the past two decades, while considerable, has been more de facto than formal and legalistic, the result of experimentation and lessons learned from it. The decision to end mandatory crop quotas and the system of collectives resulted in local authorities (at various levels from provinces downwards) undertaking initiatives that produced considerable rural decentralization and economic liberalization.

Evolving Roles in the Provision of Key Goods and Services

In this part, detailed attention is given to four rural goods and services that have been instrumental in Asia’s economic progress: agricultural research and extension, irrigation, the marketing system for rice and fertilizer, and education and health services. In addition to directly influencing rural development, these goods and services lend themselves to a range of alternative financing and provisioning arrangements involving the State, local governments, rural communities and community organizations, and the private sector.
Changing Technology and Its Impact on Research and Development

The enormous impact of the green revolution on agriculture led to greater investment in agricultural research and extension systems. It has also introduced additional players in rural development: international agricultural research centers (IARCs), which have contributed mightily to the advancement of agricultural technology in Asia, and multinational for-profit corporations, which today dominate developments in biotechnology.

Investment in research has been socially profitable and governments need to maintain their involvement. The organization of that research will differ depending on the genetic makeup and reproductive characteristics of crops: for self-pollinating crops, public-sector research is essential because there is no way for-profit institutions can recover research costs; for cross-pollinating crops and small animals, private-sector research can be profitable; and for trees and large animals, farmers themselves should usually be credited with what improvement occurs.

Public institutions used to have a monopoly in agricultural research, but two developments have altered this: first, biotechnology, which introduces the multinational corporations as significant new players, and second, the reduced focus on genetic improvement and the increasing importance of research to resource management. The rise of biotechnology has changed genetic improvement research a great deal and will no doubt add to the pool of knowledge and technologies for agriculture in the future. Its entry onto the scene is also introducing inherent biases in favor of proprietary technologies and away from most tropical crops grown extensively in Asia such as cassava, coconuts, and specialty crops such as spices and tropical fruits; there is also a bias in favor of labor-saving genetic manipulations, which would be counterproductive for much Asian agriculture. Central governments will need to increase their capability in biotechnology; they and the IARCs should focus resources on
the Asian “orphan commodities” in which there is likely to be little private developed-country investment.

The issue of intellectual property protection has been overblown, at least in agriculture. The benefits to developing countries of adopting intellectual property protection are at best minor. Moreover, the limited empirical evidence suggests that the adoption of intellectual property protection leads, at best, to only modest increases in private investment in agricultural technology development.

Research on resource management is highly location-specific, making the concentration of work in centralized research and experiment stations inappropriate. Similarly, in extension, the top-down package approach to public extension was appropriate during the green revolution, but no longer has as great a role to play. In the future, since technology will be much more knowledge-based and even more location-specific, the need for extension services will be of a different kind. The extension system should be devolved away from the center as much as possible, with the local governments in charge of the public system and the private sector (particularly the NGOs) encouraged to participate.

Irrigation Management under Resource Scarcity

The future of irrigation is assessed in light of Asia’s emerging water scarcity. Irrigation accounts for 70–80 percent of Asian water diversion and investment in it claimed by far the largest share of public investment in agriculture during the green revolution. Failure to maintain the systems adequately, coupled with recent constraints in state financing, has prompted a variety of approaches to devolve and privatize the development, or at least the management, of individual schemes. On the other hand, the increasing scarcity of water is likely to require enhanced State regulatory roles in the allocation of water and the resolution of conflicts over its use.

The landscape of water management is characterized by the water basin as the macro unit, with the upper basin as
an area where small-scale gravity systems have typically been designed and built by traditional communities of farmers, often long before the advent of modern rural development. Insensitive state intrusions on such systems, with new designs and management systems, have resulted in their disuse, modification, or even destruction. New or traditional, small-scale systems have proved to work better when farmers’ views and participation have been solicited; “coproduction” by public agencies and participating communities has been shown to be an effective management strategy. The results of the turnover of responsibility to communities, however, has been somewhat mixed, showing little evidence that operations and management quality has improved or that turnover has improved agricultural productivity.

The lower floodplains of large river systems are usually characterized by large-scale irrigation systems designed and built by the State. These have generally not shown the benefits that were expected from feasibility studies. While they are of a size and scale not to be candidates for turnover to communities, it is reasonable to expect that users should contribute at least some of the costs of such systems. User fees, however, have had disappointing rates of success, largely because there is little linkage between the fees and the costs and quality of the services provided.

In addition to surface water management, groundwater irrigation, in the form mainly of shallow tubewells, has provided a dramatic episode in Asian rural development, especially as an example of successful private investment. Bangladesh and Indonesia show that farmers, left to themselves and when water tables permit, will have a strong preference for the relatively cheap, simple, and flexible technologies exemplified by shallow tubewells.

Water is becoming increasingly scarce in Asia. Even though agriculture is hardly the most prodigal water-using sector, it is coming under increasing pressure to release water for the nonagricultural sectors. Irrigated agriculture will tend increasingly to be a residual claimant of water, and so will come under increasing pressure to economize and to provide
a holistic and participatory integration of multisectoral water policy, development, and management. Under present circumstances, augmented supply schemes of irrigation and storage capacity are not feasible because of declining returns to investment, rapidly growing nonagricultural competition for water, and greater weight given to social and environmental factors. Supply management mainly concerns the competing goals of irrigation and electricity generation in the same water system. Demand management focuses on creating incentives for allocating water efficiently among competing uses. One way is by levying charges for water, but this often involves putting a market value on what is traditionally regarded as a common good or open-access resource, a value that can be very difficult to measure. Another way is by creating a market for tradable rights to water to be managed by public officials, community-based associations, or even private companies working under contract. A prerequisite for such a scheme, however, would be the establishment of principles for clarifying such rights. Either way, the establishment of an effective pricing system would help increase the field efficiency of water, at present only an average 50 percent, and encourage conservation.

The Political Economy of Foodgrain and Fertilizer Distribution

Since World War II, almost all Asian governments have intervened heavily in the management of foodgrain supplies both for reasons of food security, especially to meet the needs of the poorest consumers for what is considered a “merit good,” and for reasons of political economy, to obviate the need for higher urban wages as a component in the profitability of industrial investment.

The combination of the green revolution and the food crisis of the 1970s resulted in government interventions in agricultural input markets as well, notably in the fertilizer trade. The interventions, especially when coupled with the
provision of rural credit, proved extremely inefficient and costly; as food supplies and prices eased in the later 1970s the original argument—a variant on the infant-industry protection rationale—soon outlived its usefulness.

Many countries, however, particularly in South Asia, have chosen to maintain targeted food subsidies in order to protect the poor. These have taken two forms: stabilization of prices, a policy pursued in many Southeast Asian countries via the storage of grains against times of seasonal scarcity and the maintenance of floor prices to producers and ceiling prices to consumers; and procurement and targeted subsidies to guarantee supplies, more prevalent in South Asia.

While there is a clear case for government intervention to ensure that society’s nutrition objectives are attained, the case is less clear for widespread market intervention to stabilize the prices of foodgrains. In fact, by concentrating on price stabilization, governments have misdirected their efforts, failing to deal with more serious problems related to food consumption and nutrition in their societies, which are not getting the attention they deserve because resources are diverted to activities that are attended by lots of political clamor.

More efficient, market-based approaches exist as alternatives to the State grain-trading organizations, but their application has been and will continue to be tempered by the political scene, in particular the structure of incentives facing policymakers and the balance of voting power between rural and urban areas. The impact of political institutions on the issues of foodgrain price stabilization and farmer income support are analyzed in detail for the cases of Thailand, Malaysia, and Indonesia.

**Rural Human Capital**

Social services—education, health care, water supply, and sanitation—are important in raising the quality of life in rural areas and helping to reduce poverty. There have been major changes in both education and health in Asia over the
past few decades reflecting the rapid growth in the region. In education, primary schooling enrollment has risen dramatically, with levels of 100 percent reached in many Asian countries. In health care, there are improved facilities, especially hospitals, and the harnessing of developing technologies to provide large-scale immunizations. Such social services also provide the long-run foundation for economic and social development.

Regional differences in education and health levels reflect four features:

• a marked urban bias in the availability of services;
• the rapid growth of private-sector involvement in the education and health sectors;
• the changing role of government brought about by the huge increases in the cost of these services and the more and more clearly limited capacity of governments to handle increasingly complex societies; and
• Asian income growth and its implications for consumer willingness to pay for health and education services.

Education and health are highly desired “goods” for almost all households, so it is appropriate that consumer willingness to pay be exploited as incomes rise. Thus, the relatively slow increase in rural incomes that is expected to continue in the future argues for greater allocation of public resources to the needs of the rural areas.

As the basis for formulating revised policies for providing education and health services in rural areas of Asia, four aspects should be considered:

• accessibility, both physically and as a result of low population densities and lack of affordability;
• quality, of both educational and medical personnel in rural areas and the conditions of rural schools and medical facilities;
• financing; and
• management.
Securing future financing for education and health care will require governments to consider what they can and should fund. In the health sector, it will necessitate some reassessment of policies, especially those allocating funds to the wrong types of services and to the wrong population groups: at present, for example, funds are provided for interventions of low cost-effectiveness such as cancer surgery instead of to critical and very cost-effective interventions to contain infectious diseases; in addition, by providing the best health services to urban areas, governments are in effect subsidizing health care to the more affluent sectors of society and neglecting the poor.

Given the predilection for private-sector funds to go to urban areas and for the more affluent consumers who can afford to pay for these services to be located there as well, governments should focus their public funding in rural areas. Even this reallocation of public funding may not be adequate, however. The involvement of NGOs, the enlistment of community support, cost sharing, local taxes for education, and even revenue-earning activities (by schools) are among the possibilities being considered and tried out in various parts of Asia.

Conclusions

With the entry of new actors into the area of rural development such as NGOs, local communities, and multinational biotechnology corporations, it bears re-emphasizing that the main old actor—the State—nonetheless retains many of its traditional roles, as well as acquiring several new ones. The old roles of the central government, for which there remains an unambiguous need despite the appearance of new actors, include the following:

- Taxation and macroeconomic stabilization:
  - provision of pure public goods, such as basic agricultural research;
  - creation and facilitation of new markets, for example in water, which at times may require . . .
provision of enabling legal frameworks, including the establishment and clarification of property rights; and
monitoring of the markets for private goods, including the establishment of quality standards in goods such as agricultural chemicals, private health care, and education.
• Establishment of disclosure requirements for civil society organizations.

Even in those tasks that remain squarely in the public sector’s domain, however, the central Government’s performance will have to be more nuanced and sensitive to the existence of other actors than was the top-down approach of other times.

The central Government will also have tasks that will increasingly have to be shared with other actors, such as the following:

• Ensuring that every individual in society, especially the poor, is able to meet his or her basic needs. It will need to work closely with local governments to increase the accuracy of targeting and with the for-profit private sector, to ensure the efficiency of the physical distribution mechanism.
• Managing “large” irrigation structures. To do so it will have to work closely with communities of water users, perhaps turning over lower-level operations and maintenance functions.
• Providing (or providing the financing for) elementary education and primary health care, again working with local communities and perhaps also with NGOs.
• Taking the initiative to devolve powers to local levels of government, especially where these do not yet exist or are very weak. This will mean engaging in a long, complex process requiring careful preparation, extensive consultation, and meticulous planning, followed by firm political commitment, steady implementation, and above all, adequate finance.