XIII Lessons Learned

INTRODUCTION

The ongoing, revolutionary transformation of the Asian countryside underlies the apparent miracle of economic growth in the region. This revolution, first visible in dramatic gains in agricultural output, was built on farm-based technology and the increased use of basic inputs, particularly labor, fertilizer, and water. It then spread to rural towns and nonfarm activities. The success of the revolution released labor and capital for broad industrial and economic growth, provided the mass demand for the products of economic growth, and generated much of the income that initiated a rapid decrease in poverty in Asia.

Like any revolution, this one has also produced unintended consequences, leaving some lands environmentally degraded and leaving some regions, even within dynamic countries, behind. Like most revolutionary transformations, this one played out differently under different circumstances, shaped by the type, timing, and sequence of actions taken by those in power. Perhaps most importantly, though, this revolution is as yet unfinished: large parts of Asia—some of which have only recently opened up to the possibility of reform as they emerge from an era of central planning—lag behind its most dynamic economies.

In this concluding chapter are summarized the lessons learned as the first wave of this transformation swept over parts of rural Asia, what those lessons mean, and how this unfinished revolution can play itself out in areas hitherto largely or partly

left out of the transformation. In the wake of an economic shock that has threatened to slow the dynamism of even those parts of rural Asia already transformed, we take another look at the unresolved challenges that left these economies vulnerable to just such a shock. The pivotal role of changing styles and structures of governance in completing the revolution highlights what might otherwise be masked: a revolution that at first glance may seem to hinge solely on its market orientation in fact gained much of its impetus from, and will in significant part owe its succesful completion to, the public sector's effectively playing its role in supporting and supplementing the functioning of the market.

AGRICULTURAL GROWTH: AN ENGINE FOR ASIA'S ECONOMIC DEVELOPMENT

Stable macroeconomic policies, market-friendly policies, relatively open trade policies, and aggressive public investments in education and infrastructure have driven the accumulation of capital and technological change that produced rapid growth in East Asia. Economic reforms to apply this policy package in South Asia and in several Asian transition economies show promise of accelerated growth in these regions. But successes with this policy agenda were in most cases built upon rapid agricultural and rural economic growth during the early stages of the transformation. This agricultural growth was driven by the green revolution, a cost-reducing technological package that led to significant improvements in productivity on small and large farms alike. Because of the size of the agricultural sector, the productivity gains that were achieved had economy-wide significance and the benefits of growth were distributed widely across income groups in rural areas. Rapid growth in agriculture freed up labor and capital for the nonfarm economy, maintained a downward pressure on the prices of food and key primary inputs for agro-industry, contributed to foreign exchange earnings (through reduced food imports and increased

agricultural exports), and provided a buoyant domestic demand for nonfarm goods and services. These results of agricultural growth not only led to rapid growth in the rural nonfarm economy, but also contributed importantly to the transformation of the urban-based economy.

Agricultural growth and the move to more open, market-oriented policies were synergistic. Economies with massive public intervention (for example, the centrally planned countries and India), weak infrastructure, and inward-looking rather than export-oriented economic direction were least successful in using the agricultural revolution to stimulate a broader economic transformation. For example, the PRC inititiated rapid agricultural growth through green-revolution technologies relatively early, but failed to capitalize on this for successful national economic growth until the process of economic liberalization was begun. National economic growth in India and the Philippines was also relatively slow despite successful green revolutions, but their growth performance is improving as they reform and liberalize their economies.

As economic growth proceeds and agriculture declines in relative size, economy-wide policies that support factor accumulation and productivity growth, including fiscal discipline, market-oriented policies, open trade policies, investment in education, and institutional quality, are increasingly important in determining the pace of economic transformation. But recent experiences in the transition economies and with the Asian financial and economic crisis have shown the continuing importance of agriculture in Asia. The agricultural sector has played a pivotal role in determining the pace of reform and constitutes an important backbone for the acceleration of economic growth in transition economies. The rigid, centralized, and collectivized agriculture structure in the Central Asian economies fell apart with the collapse of the Soviet Union and paralyzed growth prospects in the initial reform years, despite the gradual adoption of market reforms.

The central control of agriculture was much weaker in the East Asian transition economies at the onset of reform. The higher prevalence of smallholder agriculture contributed to a

smoother transition in the agriculture sector and thus in the overall economy. The existence of surplus labor that could be released to the industrial sector was also favorable for economic growth during the transition process. As economic transition proceeded, the agriculture sector helped cushion the adverse impacts of initial dislocations due to reform in the nonagricultural sectors, stimulating economic sectors in several ways:

- through its linkages with related industries, like food-processing;
- through the provision of social stability while a large segment of the population remained employed in the agriculture sector;
- through the provision of food security and savings in foreign exchange on food imports; and
- through the creation of foreign exchange through exports of cash crops.

The agricultural sector has been an important factor in countering some of the negative effects of the financial and economic crisis. The urban economy has been the hardest hit by the crisis, and sharp increases in unemployment in urban areas have been compounded by the lack of social safety nets for the newly unemployed and the newly poor. However, the agricultural and rural regions in Thailand and Indonesia have absorbed large numbers of persons returning from urban areas, relieving pressures on overburdened urban social services. Moreover, the agricultural sectors in these countries have responded strongly to the real exchange-rate depreciation that has improved the competitiveness of the sector. Increased agricultural production and exports have helped compensate for the negative income effects of the crisis.

MAKING GROWTH PRO-POOR: A KEY TO POVERTY REDUCTION IN ASIA

Rapid agricultural and economic growth has benefited the poor. The incidence of poverty in East and Southeast Asia was reduced by two thirds between 1975 and 1995, while in South Asia, which grew more slowly and had more rapid population growth, the incidence of poverty nevertheless declined by one third. Comparable progress has been made in reducing poverty in rural areas, but poverty in Asia remains overwhelmingly a rural problem. More than three fourths of all the people living below the poverty line in Asia are in rural areas and tend to be illiterate, to depend on subsistence agriculture—often in resource-poor areas—and to depend on agricultural or low-skill labor for their livelihoods.

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 incomes of small-scale farmers and landless laborers is particularly important in reducing poverty. In India, growth in agricultural output per hectare is an important factor in explaining cross-state differences in rural poverty reduction between 1958 and 1994. Moreover, the initial investments in physical infrastructure and human resources 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 higher long-term rates of poverty reduction in rural areas. Progress in reducing rural poverty is thus directly related to public investments in agriculture, education, and health.

Growth alone is therefore not sufficient to reduce poverty rapidly. Policies must also reach out directly to the poor, particularly through investments in their human capital. Investments in health, nutrition, and education not only directly address the worst consequences of poverty, but also attack some of its most important causes (see also below). Moreover, even with rapid economic growth, some of the poor will be reached

slowly if at all and many of them will remain vulnerable to economic reversals. These groups can be reached through income transfers or through safety nets that help them through short-term stresses or disasters. In the agricultural sector, the poor are benefited most when

- land is distributed relatively equitably;
- agricultural research focuses on the problems of small farmers as well as large;
- new technologies are scale-neutral and can be profitably adopted by farms of all sizes;
- efficient input, credit, and product markets ensure that farms of all sizes have access to needed modern farm inputs and receive similar prices for their products;
- the labor force can migrate or diversify into the rural nonfarm economy; and
- policies do not discriminate against agriculture in general, and small farms in particular, (for example, no subsidies for mechanization).

The green revolution met most of these requirements in the more successful countries, particulalrly when preceded by a land redistribution, as in the cases of Taipei,China and the Republic of Korea, and by massive public investments in rural infrastructure.

AGRICULTURAL AND RURAL ECONOMIC GROWTH: MARKETS ENHANCED BY PUBLIC POLICIES

The past three decades have been remarkable for the failure of central planning and the subsequent turn toward market-oriented economic development in Asia. However, the experience of these 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 rural infrastructure, and by the existence (or introduction) of secure property rights to land. 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.

Agricultural Research and Extension

Strong agricultural growth in most Asian economies has been based both on rapid growth in input use and on productivity growth. The main sources of productivity growth have been public agricultural research and extension, expansion of irrigated area and rural infrastructure, and improvement in human capital. The rates of return to public research are high, showing the continued profitability of public investment in agricultural research and strongly indicating that governments are underinvesting in the sector.

In addition to driving overall agricultural growth, research has also facilitated the process of commercialization and diversification of agriculture and the rural economy by generating new technologies that increase productivity and farmer incomes. Improved technologies provide farmers with the flexibility to make crop choice decisions and move relatively freely between crops and to increase the linkages to the nonfarm rural economy. Crop-specific research includes increases in yield potential, shorter-duration cultivars, improved quality characteristics, and greater tolerance to pest stresses. System-level research includes land management and tillage systems

that allow for shifts of cropping patterns in response to changing incentives and farm-level water-management systems that can accommodate a variety of crops within a season.

The role and structure of agricultural research are changing over time. The relative importance of productivity-driven growth will increase, because growth in input use is declining as many regions in Asia are reaching high levels of input use. Private investment in agricultural research—which generates significant public benefits—will increase in importance, if policy reforms continue to create and/or 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 agricultural research, however. Agricultural research is often long-term, large-scale, and risky and while the returns to new technologies are often high, the firm responsible for developing the technology may not be able to appropriate the benefits accruing to the innovation—as in the case of improved open-pollinated rice and wheat varieties. The benefits of agricultural research often accrue to consumers (through reduction in commodity prices due to increased supply), rather than to the adopters of the new technology, so social returns may be greater than private returns to research. Therefore, a sustained public role in funding agricultural research will be essential, particularly for crops and regions, such as less favorable environments, that are unlikely to be served by the private sector.

New agricultural technologies in Asia—such as technologies to implement integrated pest management and to improve the nutrient balance and the timing and placement of fertilizer applications—are increasingly complex, knowledge-intensive and location-specific; they demand continued investment to create a better and more decentralized research and extension system. Because new technologies are more demanding for both the farmer and the extension agent, they require more information and skills for successful adoption compared to the initial adoption of modern varieties and fertilizers. Decentralization of the structure of existing extension

services that encourage a bottom-up flow from farmers to extension and research could also help farmers cope with the additional complexity of efficiency-enhancing technology. Bottom-up information flows, combined with adaptive, location-specific research, is particularly important in the transfer of complex crop-management technologies. Other modern technologies, such as commercial poultry technology, will be transferred essentially intact from developed countries, without local adaptation, but will similarly require higher levels of education and management skills than traditional livestock operations. Finally, the increasing importance of new, knowledge-intensive technology requires a market-friendly environment for the adoption and adaptation of new technologies and the removal of restrictions on technology imports, which must be encouraged through continued progress in economic liberalization.

Investment in Rural Infrastructure

Infrastructural investments play a crucial role in inducing farmers to move toward a commercial agricultural system and in developing the rural nonfarm economy. Rural towns emerge as focal points in the development of the rural nonfarm economy, with increasing densities of nonfarm activity. To play this role, they need well developed infrastructure, transport, and communications systems, both within their own boundaries and linking them to larger urban areas and to their surrounding hinterland. Village access to rural towns and marketplaces is the key to creating effective demand linkages within rural regions and to spreading the benefits of nonfarm economic growth.

Infrastructure development also affects the supply side of the rural nonfarm economy. Electrification, for example, is especially beneficial to small manufacturing and processing enterprises, shops, and service establishments, giving them a more reliable and cheaper source of power. Rural roads facilitate the movement of raw materials to rural towns and villages and of final products to their main markets, and at lower cost. They

enable firms to increase market size by giving them improved access to larger geographic areas; they increase rural labor mobility so that more village-based workers can take advantage of nonfarm employment opportunities in nearby towns. Telecommunications are increasingly important in linking rural firms to their customers and to the larger economy, enabling them to provide better and more timely service.

Priority-setting for infrastructure investment is complicated, because infrastructural investments take time to implement and demand careful attention to sequencing. Given the necessity for targeting, priorities for targeting investment by geographic area and type of infrastructure should be guided by at least three criteria: population density, agricultural development, and potential market integration. Targeting investments is particularly crucial with respect to the development of of resource-poor areas. Less favored environments are often poorly placed to compete in liberalized markets, because of their restricted access to markets and high transport and marketing costs. The public sector has an important role to play in building and maintaining roads in these areas and in promoting the expansion of competitively priced private transport, marketing, input supply, and financial services. Investments in electricity and telecommunications are also needed if the private sector is to grow. Investments in clean water and in rural people's education and health not only increase their productivity in agriculture but also enhance their opportunities to diversify into nonfarm activities, including out-migration to better-paying jobs. Public investments in less favored environments can yield favorable growth as well as poverty-reduction payoffs, so these investments do not have to be a net drain on the national economy.

Property Rights

Secure property rights to land have been a critical stimulus for production efficiency and agricultural growth. Secure rights to land create the incentives farmers need to invest in land

improvements that conserve and increase long-term productivity growth. Secure land rights are complementary to policies that aim at liberalizing and integrating financial markets, because secure rights increase the probability that farmers can recoup the benefits of long-term investments and thereby increase their willingness to make them. Because they can act as collateral for loans, secure land rights also increase lender willingness to offer credit, leading to easier financing of purchased inputs and land improvements. Strengthened property rights are important for realizing the growth potential generated by economic liberalization, which places a premium on flexible farmer response in allocation of water, land and other resources in the context of changing prices, comparative advantage, and economic opportunities. If rights to the basic resources such as land and water are poorly secured and enforced, these resources can remain locked into inefficient uses. Moreover, strengthening of property rights, by encouraging on-farm conservation investments, might actually advance soil-conservation efforts in the future.

The lack of clearly defined property rights in the Central Asian transition economies has been a severe constraint on restarting growth. Property rights to land and security of tenure remain uncertain and the transition to autonomous cooperative management or private farming has been slow. Both the boost in agricultural productivity in the East Asian transition economies that came with improvement in land security and the far greater productivity in the small private sector in Central Asia indicate that successful transformation of property rights leading to privatization of state-owned enterprises and establishment or extension of private property would be an important impetus to growth in Central Asia.

The combination of the establishment of the household responsibility system and improved security in land rights was the fundamental reform that spurred rapid productivity growth in agriculture in the PRC after 1978. Despite this tremendous success, property rights in the PRC have not been fully secured; continued weakness in property rights is one reason for the slowdown of growth in the farm sector. The household

responsibility system individualized the claim to residual income, but continued to vest land ownership in the collective, thus discouraging farmers from making medium- and long-term investments in land. Granting fully secure individual land rights could boost agricultural productivity in the East Asian transition economies, as well as in Central Asia.

In some cases, informal, indigenous property rights—if locally recognized and enforced—may lend adequate security. Local organizations are needed, particularly where communal property rights make sense as a way for users to spread risk and ensure access to a resource and should therefore be preserved, but also where informal rules guide the way in which privately owned property rights are guaranteed. Such organizations should have clearly defined membership and membership rights and should set rules about monitoring and a range of enforceable penalties of graduated severity matched to the seriousness of the transgression. Sometimes local systems come under stress from changing factors such as greater population pressure; indigenous systems lose their ability to completely guarantee security of access to resources. Even here, however, government policies aimed at bolstering traditional systems or helping them adapt to changed conditions may yield better outcomes than a shift to wholesale reliance on formal, legal systems.

Poor performance in state-owned enterprises in transition economies is also linked to lack of property rights. Corporate governance structure is weak due to the lack of an appropriate legal and regulatory framework, financial discipline, and incentive structures. The lack of financial discipline and poor incentive structures have perpetuated the inefficient managerial and operational practices of centrally planned systems. In order to strengthen market-based incentives, continued progress toward privatization should be accompanied by adoption of effective corporate structures, removal of government subsidies and enforcement of hard budget constraints, introduction of transparent enterprise accounts, and development of bankruptcy-implementation procedures.

Economic Liberalization

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 to catch up technologically, according to its comparative advantage, 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. Asian agriculture has benefited from the general economic liberalization and the reform of trade and macroeconomic-policy regimes that improved its competitive position between the mid-1980s and the early 1990s. The main components of economic liberalization have included reduction in trade restrictions, realignment of macroeconomic policies (reduction of fiscal deficits, elimination of multiple exchange rates, easing of exchange controls), and a liberalization of markets in general, including financial and asset markets. The reform process opened up international trade opportunities and provided improved price signals to guide producer decisions.

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 East and Southeast Asian countries during the financial and economic crisis beginning in 1997 eliminated effective taxation of agriculture caused by real exchange-rate overvaluation and provided a significant stimulus to agriculture.

During the 1990s, the highly variable incentive environment for agriculture caused setbacks. Nevertheless, continued reform of trade and macroeconomic and price policies, to create a level playing field across economic sectors

and agricultural commodities and to provide a stimulating environment for agricultural exports, will provide further incentives for efficient agricultural growth. International trade agreements, including the Uruguay Round agreements—which covered agriculture for the first time—and the creation of the World Trade Organization, should provide a supportive environment for continued agricultural liberalization in Asia. These agreements provide a framework for reform of agricultural trade and domestic policies, by strengthening the rules governing agricultural trade in order to improve predictability and stability for both importing and exporting countries. International agricultural-product differentiation and international investment and technology transfer will further encourage agricultural trade liberalization and encourage agricultural growth. The dynamic gains to developing countries in Asia from WTO and other liberalization are likely to be substantial, including the improvement of access to international technology and capital, strengthening of investor confidence, and encouragement for unilateral trade liberalization programs.

Apart from some manufacturing activities, the rural nonfarm sector was largely ignored by policymakers until recently; because it depended heavily on agriculture either directly or indirectly for much of its demand, it also suffered as a result of macroeconomic policies that discriminated against the agricultural sector. Recent macroeconomic policy reforms that have benefited the agricultural sector should, therefore, 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. However, these benefits for the rural nonfarm sector are often limited by a continuing bias toward capital-intensive industry at the expense of trade and services. Apart from India's attempt to protect selected small-scale industries, policies to assist the rural nonfarm economy have 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); this has encouraged more capital-intensive patterns of development than is optimal.

Rural Financial Markets

Along with the increased opportunities for economic liberalization come increased risks for both agriculture and the general economy. Agricultural producers may face increased price volatility, since domestic prices are pegged more closely to international prices. Simultaneous reform to liberalize and integrate domestic financial-capital markets would reduce the costs of increased price variability through risk pooling on an economy-wide basis. Financial integration for risk spreading is critical at the rural household level as well. In order to exploit the income-enhancing potential of the commercialization of agriculture, financial markets must accommodate the increased ability of households to save and build up productive asset bases and improve human resources. Rapid development of rural finance systems at the grass-roots level is thus crucial, particularly since the commercialization of agriculture often leads to large, lumpy payments of cash a few times a year. The process of commercialization itself can provide the critical market size required for efficient, unsubsidized rural banking with low overhead costs. Effective rural financial institutions can in turn assist in spreading the benefits of commercialization more widely across the community and region.

As financial services improve in rural areas, it is possible that larger shares of rural savings will be captured in rural areas (including local towns), and that this will further facilitate the growth of the rural nonfarm economy. The financial needs of agriculture are changing with the transformation of the rural economy. Despite the exodus of labor from agriculture, farms in most of Asia are getting smaller on average, as well as more cash-oriented and more productive per hectare. The vast majority of farm households are also reducing their dependence on agriculture by diversifying into nonfarm sources of income.

This helps raise total household income, leading to higher savings, and gives farms access to more cash income that is less seasonal in nature than agricultural receipts.

Taken together, these changes seem likely to improve seasonal and annual cash flow for most farmers, thereby reducing their need for conventional forms of agricultural credit. Their financial needs are becoming more complex and diverse and include access to deposit and savings accounts and possibly also investment loans for nonfarm business activity as well as for agriculture. There is also increasing demand for financial services by many small-scale and part-time nonfarm businesses, especially in the service sector, as witnessed by the recent explosion in microfinance in rural areas. More flexible and customer-oriented financial services are required to meet these needs.

In the face of these growing needs, government intervention has often had a negative impact on rural financial markets, limiting their ability to serve not just the rural nonfarm economy but even farmers themselves. Government interventions have included lending requirements imposed on banks, refinance schemes, loans at preferential interest rates, credit guarantees, and lending by government-operated development finance institutions. These interventions have in most cases had limited impact on the adoption of new technology or on agricultural production, while seriously impairing the banks, cooperatives, and specialized agricultural development banks that have tried to implement them. Moreover, government interventions in rural financial markets failed to provide savings and other financial services demanded by farmers. Middlemen and banks often captured the subsidies intended for borrowers. Interest rates were low but borrower transaction costs were high, banks earned low returns on their capital, and credit allocation may have worsened income distribution if the credit was skewed in favor of larger firms. Financial discipline was damaged and intermediaries weakened.

The general failure of directed and subsidized credit calls for a new approach that limits the role of financial markets to financial intermediation rather than serving as a tool to stimulate

production, compensate for distortions in other markets, and alleviate poverty. The appropriate role for government is to create an environment in which competitive financial institutions can emerge. Among other things, this means macroeconomic stability, reasonably low levels of inflation, procedures to enforce contracts, the protection of property rights, and a regulatory and supervisory system that can ensure prudent financial operations.

Governments also need to avoid the temptation to use financial institutions for social policies such as subsidizing particular economic activities or groups within society. Financial-market interventions are a poor second-best approach for dealing with important social problems that require more direct policies to encourage human capital formation and improve access to productive assets. The new approach is shown by a number of Asian governments that are moving to financial market liberalization, reducing the targeting of loans and setting interest rates high enough to cover costs, but reform of rural financial systems still has a long way to go.

Investment in Education, Health, and Nutrition

Education has been an important source of productivity growth in agriculture. Development of human capital makes investments in physical capital more productive and facilitates the adoption of modern knowledge-intensive technology. Rapid growth in agriculture, the rural economy, and the general economy have in turn placed increasing demands on education and the development of human capital. Absorption of the rural poor into the industrial and service sectors has significant costs in terms of learning new skills; rural people need adequate training if they are to successfully diversify into nonfarm activity. This will be especially true of many service activities, which often depend more on skilled people than on equipment and infrastructure. Investments in general education will be required, as well as targeted training programs to enhance technical, managerial, and service skills.

The rapidly changing nature of agricultural technology also places higher demands upon education. Crop-management technologies to implement integrated pest control and to improve the nutrient balance and the timing and placement of fertilizer applications are highly complex, knowledge-intensive, and location-specific. Because new technologies are more demanding for both the farmer and the extension agent, they require more information and skills for successful adoption than did the initial adoption of modern varieties and fertilizers.

In addition to education, broader social-support services are critically important to increase the benefits of the growth process and and reduce the risk of adverse consequences. Foremost among these support policies are health and nutritional services. Nutritional improvements are determined by both health and food consumption. Negative health effects from poor household and community health and sanitation can overcome potential positive effects of income growth from agricultural growth and commercialization. Increased income and food consumption help to reduce hunger but cannot solve the problem of preschool children's malnutrition, which results from a complex interaction of lack of food and morbidity. Health and sanitation in rural areas must be promoted through improvement of community-level health services to fully exploit the welfare effects of agricultural growth. In addition to causing severe short-term problems, the financial and economic crisis in East and Southeast Asia has revealed policy and institutional shortcomings in social services that will challenge Asian economies well beyond the crisis period. In the short run it is essential to preserve existing economic and social services for the poor, including health, education, and employment, while in the longer term, stronger social safety nets must be built.

COMPLETING THE TRANSFORMATION: REVERSING ENVIRONMENTAL DEGRADATION

Agricultural and economic growth in Asia have had an overwhelmingly positive impact on human well-being in the region. But unintended negative consequences have grown in magnitude and pose serious problems for future policy. Chief among these unintended consequences are environmental degradation and growing regional disparities that threaten to prevent less favorable environments from sharing in growth. Limited amounts 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. Lessons for addressing these unintended consequences are reviewed in this and the next section.

Two main types of environmental degradation have occurred 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 has caused substantial environmental degradation. On the other hand, 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, increasing soil erosion. A third type of environmental degradation that could expand dramatically is waste-disposal and water-quality problems caused by intensive livestock production.

Agricultural intensification *per se* is not the root cause of lowland resource-base degradation, but rather the 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 often appear mutually incompatible. Policies designed for achieving food self-sufficiency tend to undervalue goods not traded internationally, especially land and labor resources. As a result, food self-sufficiency in countries with an exhausted land frontier has come or could come at a high ecological and environmental cost. Appropriate policy reform, at the macro as well as at the sector level, will go a long way towards arresting and possibly reversing the current degradation trends, but the degree of degradation in many regions will pose severe challenges to policymakers.

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 Lao PDR.

With rapidly increasing demand for meat and livestock products in much of Asia, pressures from livestock production could cause similar or more severe environmental degradation. 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. But, as with intensive crop agriculture, 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 on input and output markets and the establishment of price incentives or regulations to reduce the production of environmental externalities in both sectors. These environmental problems in higher-potential areas for crop and livestock production will 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. For crops, this means particularly those areas already irrigated; for livestock production, increasingly this refers to areas where traditional animal husbandry will be left behind as the sector industrializes.

To mitigate environmental effects that may also be severe in the less favorable areas, perhaps affecting the poor disproportionately, a different type of policy is required. Here, 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 such a way as to preserve 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 benefits of market reform reach them as well. Environmental degradation has been a by-product both of improper policies in the high-potential areas and of outright neglect in the low-potential areas. In both cases, new strategies to safeguard against or mitigate existing environmental degradation must be brought into line with policies that have been set with other objectives in mind.

Although land degradation is of overriding importance in some geographic regions within Asia, probably the most severe environmental challenges facing Asian developing countries are water scarcity and quality. 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 needs for all or part of the year. Growing water scarcity will result largely from rapidly growing demands for agricultural, industrial and household purposes, but the potential for expanding supplies is also diminishing. Water-shortage problems will also be 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 reform of water policy. Such reform 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, first, policies to improve the flexibility of resource allocation in agriculture, through removal of subsidies and taxes that distort incentives and encourage misuse of land and water; and, second, the establishment of secure property rights and investments in research, education and training, and public infrastructure.

The most significant reforms in the water sector should include 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 appropriate 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 water-policy reforms should include a balancing of improved, integrated water management at the river-basin level, through strengthening of relevant public institutions and improved tools for planning and monitoring purposes, with decentralization and privatization of important sub-basin water management functions to the private sector or community-based water-user groups. Establishment of secure water rights of users and the use of incentives to encourage water conservation, including markets in tradable water rights, pricing reform and reduction in subsidies, and implementation of effluent or pollution charges, would help to reduce water use and the negative environmental consequences of overuse of water. The innovative institutional and policy reforms required for water management require a complex blending of public-sector, market, and civil-society roles in order to address the problems not only of water scarcity and quality, but of the other important environmental challenges.

COMPLETING THE TRANSFORMATION: REACHING LESS FAVORED LANDS

Past agricultural development strategies in Asia have emphasized irrigated agriculture and "high-potential" rainfed lands in an attempt to increase food production and stimulate economic growth. This strategy has been spectacularly successful in many countries and produced the continent's remarkable rural transformation. At the same time, however, large areas of less favored lands have been neglected and lag behind in their economic development. These less favored areas 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 agricultural yields. The result is often worsening poverty and food-insecurity problems, as well as the widespread degradation of natural resources noted in the previous sections.

In order to promote economic growth and redress poverty and environmental problems, 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 especially 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. Investments in irrigated and high-potential rainfed areas cannot be neglected, because these areas still provide much of the food needed to keep prices low and to feed growing urban populations and livestock. On the other hand, the poverty, food-security and environmental problems of many less favored areas are likely to remain serious in the decades ahead as populations continue to grow. 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.

The successful development of less favored lands will also require new and improved approaches to policy making and institution-building. Successful development often will require stronger partnerships than needed in high-potential areas between agricultural researchers and other agents of change, including local organizations, farmers, community leaders, NGOs, national policymakers, and donors. It will also require time and innovation: new approaches will need to be developed and tried on a small scale before being disseminated more widely and their testing will take time to assess and evaluate. All this will require patience and perseverance on the part of policymakers and donors.

EXTENDING THE TRANSFORMATION: A NEW UNDERSTANDING OF THE ROLE OF GOVERNANCE

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.

The demand for improved governance is also driven by some of the failures of the past, as the East and Southeast Asian financial and economic crisis has exposed serious weaknesses in financial and corporate oversight and 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; 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 redefined 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 need to be maintained for bypassed regions and the rural poor, whose limited consumer wherewithal prevents a satisfactory private-sector response.

Good governance implies the creation of a political and institutional environment in which authority is based on the rule of law, is transparent, is accountable to society, and 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. Governance reforms must seek greater transparency and accountability in public-sector activities.

Reform is also necessary in the relationship between the public sector and the recipients of public-sector services. Diversified delivery of services involving government, civil society, and religious institutions would help reduce the risks of relying on only one delivery system. 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 improved services but should not be seen as a panacea. Local elites may have weaker technical resources at their disposal than regional or national ones, along with greater opportunities for corruption and lack of transparency.

NGOs and civil society more generally can also play an important role and can be effective in areas more traditionally covered by government, such as poverty relief and health care and nutrition. But mutual distrust between NGOs and government has often become deep-rooted; both parties need to work to develop improved collaboration and provide a better foundation for interaction between government and civil society.

EXTENDING THE TRANSFORMATION: MANAGING A NEW REVOLUTION IN AGRICULTURAL TECHNOLOGY

The unfolding biotechnology revolution in agriculture has the potential to drastically 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 crops. These 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 may now 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, and 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 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. And 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 solving 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., IRRI 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. But these developments are at an early stage 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., genes "jumping" from genetically modified plants to other plants through cross-pollination, rapid creation of new pest biotypes through adaptation to genetically modified plants) 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, to adapt breeding and crop-management strategies to minimize 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), this will impede the free flow of agricultural genetic material between countries. 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 may 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.

EXTENDING THE TRANSFORMATION: MANAGING GLOBALIZATION

Market-oriented policies that have favored economic liberalization, open markets, and integration with the global economy have been enormously 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 recent Asian financial and economic crisis. Most concretely, the economic crisis raised serious questions about the sequencing of open-economy reforms and about the free convertibility of short-term foreign capital inflows.

Foreign direct investment and other long-term, relatively stable investment have a significant impact on 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.

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: the lack of coordination exacerbated all the dire effects of the financial crisis in many Asian countries. Both prudential regulation of currency positions of banks and strengthened enforcement 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, temporary controls on capital inflows, combined with domestic reforms and greater disclosure, may be necessary to help reduce the frequency and magnitude of shocks. Capital-account restrictions need to be explicit, transparent, and market-oriented, with the Chilean approach described in Chapter IX providing a possible model for market-oriented short-term capital controls.

More generally, both the tremendous successes of the East and Southeast Asian countries with economic liberalization and the recent financial and economic crisis drive home the point that appropriate policies and institutions must be in place if the benefits of globalization and open economic policies are to be reaped. For East and Southeast Asia to correct the problems revealed by the economic crisis and for South Asia and Central Asia to liberalize and open their economies, the continued development of domestic institutions and policies to manage globalization is essential. Full and effective economic liberalization and linkage with the global economy require continued reform of fiscal and financial policies and institutions, property and contract laws that foster modern commerce, flexible and efficient factor and product markets, and continued development of technology and human capital. Future successes in rural and general economic development will be driven by domestic policies and processes, including public and private domestic investment, macroeconomic stability, research-based technological change, education, and human capital

development, with globalization serving as an important facilitator and spur to these processes.

ALTERNATIVE FUTURES: NO ROOM FOR COMPLACENCY

The future for Asia, even after the recent economic shocks, looks far brighter than in the desperate days of the 1960s. In fact, if likely trends continue (as captured in Chapter XII's baseline scenario for food and agriculture), both Asia and the world should be able to meet projected food demand with greater production and increased trade, at least in the aggregate. The continuation of likely trends does not call for a passive, sit-back approach, however, but rather for steady progress by governments and the international community in devising and carrying out policies for rural Asia already shown to be cost-effective in terms of agricutural production and its positive multiplier effects in the rural nonfarm economy and beyond. These policies include investment in agricultural research, extension, irrigation and water development, human capital, and rural infrastructure. With these measures, heightened pressure from rising populations and incomes in Asia and around the world will not overwhelm aggregate food supplies, regionally or globally. In fact, Asia will have more food available per person and a stronger overall trade position; real world food prices will be steady or declining slowly for the main food commodities.

As can be seen even from the situation today, however, adequate food supply in the aggregate does not translate into food security for everyone everywhere. Behind even this optimistic picture in the aggregate lies the fact that progress against food insecurity comes neither quickly nor easily. Even with the gains from trade and the overall ability of the world's productive capacity to meet effective demand for food, food security will improve only slowly; massive human suffering will persist in Asia, with over 100 million children still suffering

from malnutrition in 2010, approximately 80 percent of these in South Asia.

The numbers of malnourished children could grow substantially, moreover, if complacency wins the day and a more passive policy approach ensues: food security is vulnerable if improvement in any one of the three policy pillars needed for the transformation—agricultural and rural income growth, supporting social services, and declining population growth—lags. Policies that moderately disfavor agriculture and natural resources, reduce social investment, or moderately slow economic reform will lead to much worse net food-security impacts and poorer diets than the baseline.

Conversely, moderate but important reductions in childhood 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. Indeed, a gap of 76 million malnourished children separates this high-investment scenario from the scenario where complacency allows investment to drop off. What is more, analysis shows food security responding in almost equal measure to the proposed changes in each of the three pillars noted above.

Even under this scenario, child malnutrition would persist, being particularly intransigent in South Asia, in part due to slower declines in population growth rates there. If income growth and investment in agricultural and social sectors were instead boosted significantly, the effect would be to mount a significant assault on childhood malnutrition in Asia. To bring levels of childhood malnutrition down to near zero would require extremely aggressive policy reform and public investment to raise income growth, agricultural productivity, and social indicators for all of Asia close to the peak levels experienced by Asia's most dynamic economies in the wake of the adoption of green-revolution technologies.

CONCLUSION

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 Asia shared in the transformation. Moreover, the regional economy has hit a rough spot that some fear may turn the clock back on rapid growth where it occurred and stymie growth elsewhere.

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 possible and supplement it where not. But 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 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. 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 seriously reduced within the next generation, then additional allocation of central government funds will almost certainly be required, at least in the near future.

While the specter of famine that hung over Asia in the 1960s has not returned in the 1990s, widespread poverty and malnutrition still coexist with great wealth. Completion of the rural revolution, radical reduction in poverty, and improvement in food security in Asia hang in the balance. They are attainable, if complacency is resisted.