

Special Focus

Agriculture for Development in East Asia: Lessons from the World Development Report 2008

Introduction

The pace of economic growth and poverty reduction in the East Asia and Pacific (EAP) region during the past decades has been unparalleled. Rapid growth in agriculture has been credited with kick starting this process, fostering the acceleration of industrial growth in its early stages, and serving as a major force for poverty reduction.²⁶ Today, however, economic growth in most EAP countries is largely driven by industry and services, going hand in hand with increasing urbanization, while agriculture makes a much smaller contribution – only 5.3 percent of overall East Asian growth in 1993-2005. Yet, despite some neglect during the 1990s, agriculture is once again becoming important on the development agenda, with China, for example, tripling its spending on agriculture and rural development between 2000 and 2006.

One reason for the renewed attention to agriculture is that, as growth outside agriculture has taken off, the gap between rural and urban incomes has widened, leaving behind many people in rural areas generating social and political tensions. Today more than 90 percent of the 1\$-day poor in EAP live in rural areas, the vast majority working in agriculture. How to overcome the rural-urban divide while sustaining overall economic growth is one of the core questions addressed in the World Bank's most recent World Development Report 2008 "Agriculture-for-Development".

The first section of this Special Focus outlines the scale of the rural-urban divide, the forces that are driving it and the broad scope of different approaches to resolve this problem. It notes that historically there has been a temptation for countries to turn to agricultural protection and subsidies to tackle the divide, something that is also being observed in East Asia today. The report suggests that there may be more effective ways of reducing rural poverty and narrowing rural-urban income gaps. The two pillars of such an approach are, on the one hand, facilitating migration and more effective absorption of rural labor in the urban economy and, on the other, promoting faster rural income growth, something that is especially effective in reducing poverty. Rural income

²⁶ This was most recently observed in China, where rapid growth in agriculture in the early 1980s—thanks to the household responsibility system, the liberalization of markets and rapid technological change—was largely responsible for the precipitous decline in the official rural poverty rates, from 33 percent in 1978 to 11.1 percent in 1984 and 3.7 percent in 2000.

growth, in turn, requires attention to both agricultural development and development of the rural non-farm economy. Globalization and innovations in technology and institutions are creating exciting new growth opportunities for agriculture especially in high value products such as meat, fruit and vegetables. But there are also new challenges, in how to link poor farmers to sophisticated global supply chains, as well as from growing environmental pressures.

The second part of the Special Focus then takes up the emerging policy agenda in East Asia in more depth. The World Development Report proposes a comprehensive three-pronged rural development agenda that balances fostering agricultural growth (including in both new high value crops and staples), generating rural nonfarm employment and poor area development programs. It emphasizes decentralized, participatory, and multi-sectoral approaches for implementation. Investment in rural public goods (such as rural infrastructure, demand-driven research and extension services, rural education and training), improvements in the rural investment climate and greater involvement of the private sector (in part through public-private partnerships) are some of the entry points through which this three-pronged rural development agenda can be pursued.

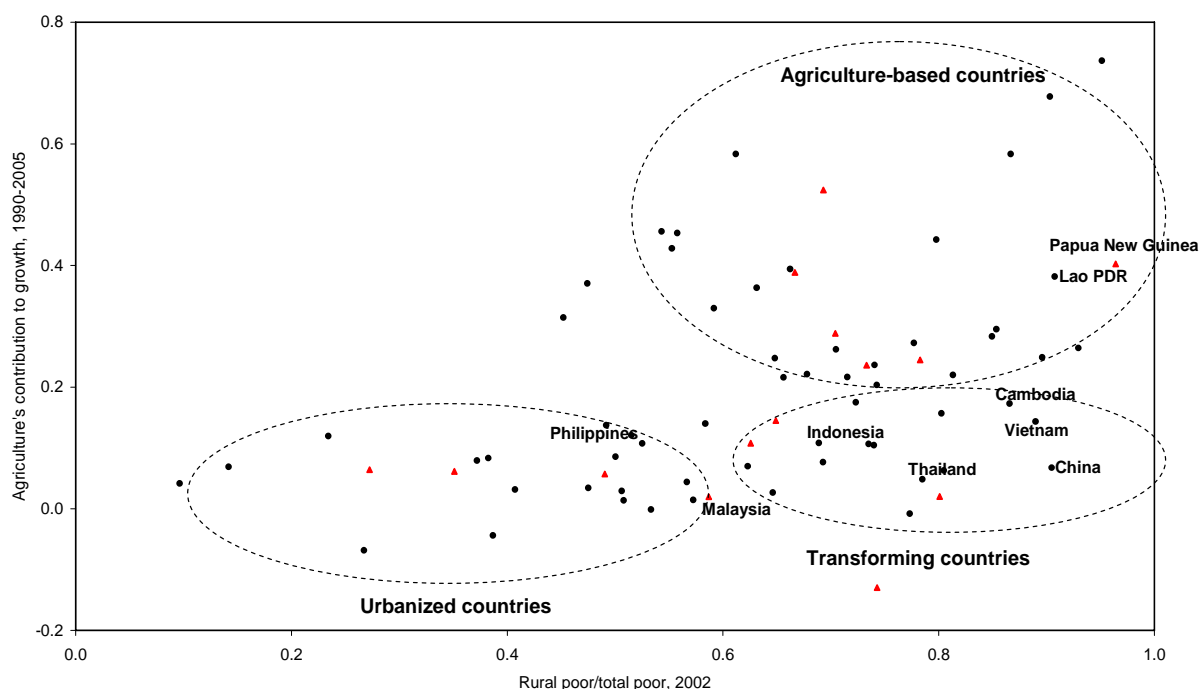
1. What can agriculture (still) do for development in East Asian countries?

1.1. The growing rural-urban divide

The World Development Report categorizes economies into three groups based on the share of aggregate growth originating in agriculture and the proportion of poor people (at the \$2-day level) in rural areas: agriculture-based, transforming and urbanized economies (Figure 1). Most EAP countries are "transforming economies", where agriculture is no longer a major source of economic growth, but poverty remains overwhelmingly rural, some 93 percent in the region as a whole. (Some exceptions include Lao PDR and Papua New Guinea, where agriculture is still a major source of growth. In the Philippines agriculture does not only contribute less to overall growth, but poverty is also more urbanized.)

A distinguishing feature of the transforming economies is a widening gap between rural and urban incomes. This is implicit in the well known structural transformation graph (Figure 2). As countries

Figure 1: In most of East Asia poverty remains overwhelmingly rural, but agriculture is no longer a major source of growth.



Source: World Development Report 2008.

develop, the share of agriculture in GDP and employment declines, but the share of agriculture in employment remains on average about twice as large as the share of GDP in agriculture, converging only late in the development process (at about US\$10,000 per capita). As a result, poverty remains concentrated in agriculture and rural areas.²⁷ Micro data confirm this picture of a widening gap between rural and urban incomes. Overall, the ratio of rural-to-urban poverty in EAP increased from about 2:1 to 3.5:1 between 1993 and 2002. This happened while absolute (1\$-day) poverty declined massively—by almost 200 million people.

The persistent concentration of (absolute and relative) poverty in agriculture and rural areas reflects, among other things, deep inertia in people's occupational characteristics. Migration out of agriculture to urban areas is often hampered by lack of information, costs, skill gaps, aging, and family and cultural ties. In some countries this slow transition of labor out of agriculture has been exacerbated by longstanding policy impediments to rural labor mobility, as in China, where the shares of agriculture in employment are still quite high (65 percent

²⁷ This holds definitely in relative terms and to the extent that the income gap is not compensated by off-farm incomes.

in 2003) compared with other countries at similar levels of development.

1.2. The pitfalls of agricultural protection and subsidies

Historically, there have been numerous attempts to reduce rural poverty and address the rising rural-urban income gap by increasing agricultural protection and subsidies. The regularity with which countries have shifted from taxing (especially export) agriculture to finance industrial development at low levels of development, to subsidizing and protecting agriculture as they grew richer, is striking. Agricultural policymaking in the EAP countries is following the same pattern (Figure 3).²⁸ While still taxing its agriculture heavily in the early 1980s, China abolished all direct taxation of agriculture in 2006 and provided US\$ 5.6 billion to subsidize farmers in

²⁸ The nominal rate of assistance to farmers is defined as the price of their product in the domestic market (plus any direct output subsidy) less its price at the border, expressed as a percentage of the border price (adjusting for transport costs, quality differences, etc.). Where important, further corrections are made to adjust for distortions on the input side (input subsidies and other interventions affecting the input price) and in the foreign exchange rate.

Figure 2: The transition of labor out of agriculture lags the restructuring of the economies away from agriculture, resulting in a widening rural-urban divide.

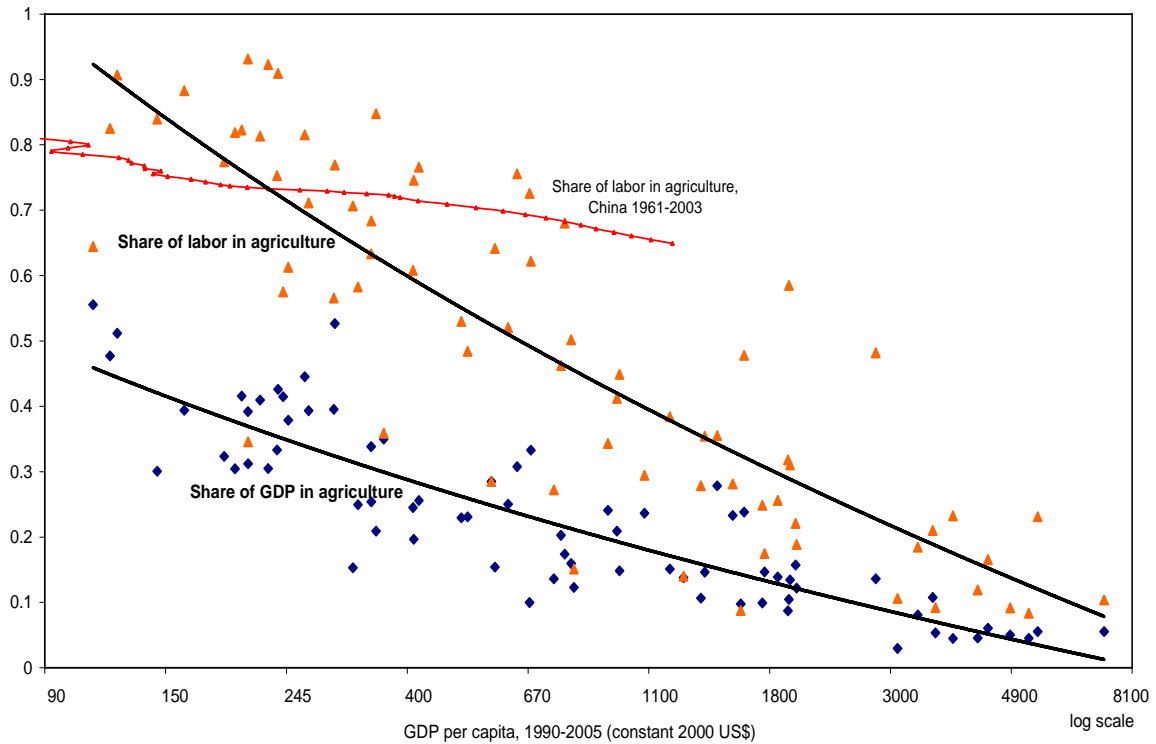
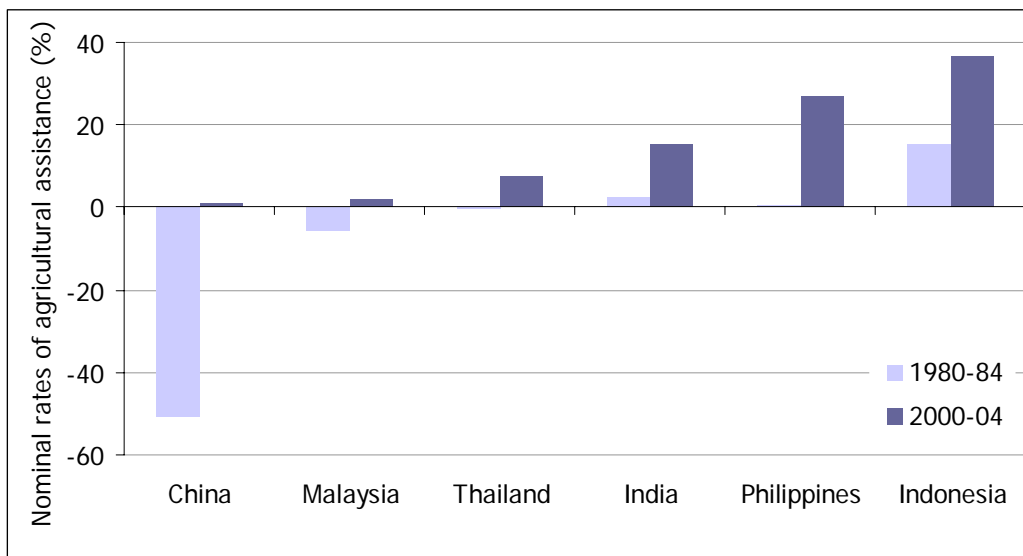


Figure 3: Countries go from agricultural taxation to protection as they get richer



Source: Anderson (forthcoming).

2007. The Philippines and Indonesia have evolved from relatively neutral agricultural price and trade regimes in the early 1980s to substantially protected ones today.

The frequent turn to protective agricultural policy instruments in fighting the rural-urban divide is politically rational. Price supports are often preferred by politicians over agricultural income supports because self-sufficiency sometimes appeals to voters, farmers fear a visible “welfare” stigma, and information on the cost of such policies is not readily available. The benefits from public investments in agricultural productivity, on the other hand, such as agricultural research and development (R&D) and rural infrastructure, are less immediate, less visible and thus less appealing to policy makers.

Yet, protective agricultural trade policies often impose high economic costs and are sometimes ineffective. In 2004 Indonesia placed a ban on rice imports as a way of supporting producer prices. But later the ban contributed to an increase in the poverty headcount from 16 percent in 2005 to 18 percent in 2006, at which point it had to be relaxed. The protection of food prices benefited the medium and larger farmers at the expense of the poor consumers, including most small farmers, who are typically net food buyers. Subsidizing private agricultural inputs such as water and fertilizer is usually also regressive, benefiting the larger farmers most. Tackling the growing rural-urban divide without imposing high economic costs that may impede economic growth remains one of the fundamental challenges facing East Asian economies today.

1.3. Urbanization and rural income growth: two pillars for growth with equity

One way to accelerate faster absorption of rural labor in the urban economy is by investing in urban infrastructure, human capital and labor market policies such as vocational training, transport services and job matching. The divergent patterns in urbanization and poverty reduction in the Philippines and Thailand (Box 1) suggest, however, that the pace and pattern of urbanization (mega cities versus secondary towns) are equally important and that urbanization efforts must be matched by investments in rural development for rapid poverty reduction. Urbanization by itself will only stimulate rural-urban migration and exacerbate problems of urban unemployment, congestion and urban poverty.

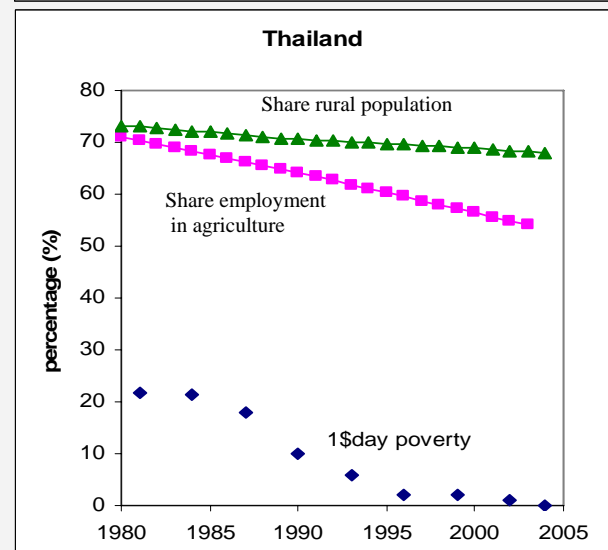
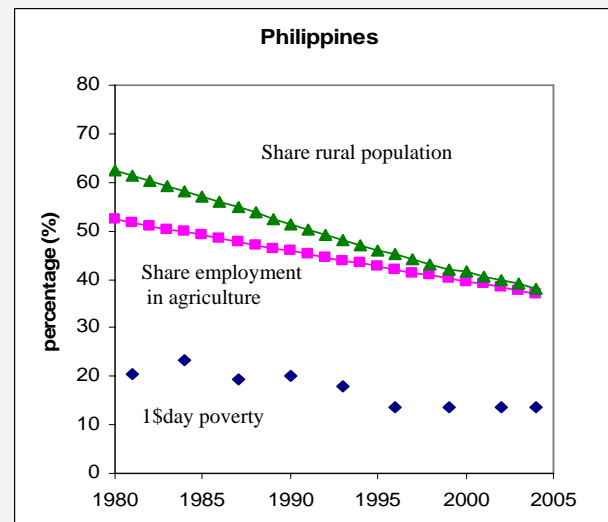
Box 1: Rapid urbanization and slower poverty reduction in the Philippines; rural diversification and rapid poverty reduction in Thailand.

In the early 1980s, Thailand and the Philippines were at similar levels of development (around US\$ 900 GDP per capita) and poverty (around 20 percent of people below the 1\$-day poverty line). The Philippines urbanized rapidly, with only 38 percent of the population in rural

areas by 2004, compared with 62 percent in 1984. Labor moved out of agriculture largely through urban migration. One-dollar-a-day poverty declined to 13.5 percent in 2004; the Gini coefficient of income inequality increased from 0.41 to 0.44.

In Thailand, urbanization was much slower—the rural share of the population declined only 5 percent points from 73 percent in 1984 to 68 percent in 2004. Labor moved more rapidly out of agriculture largely into the rural nonfarm economy. By 2004, 1\$-day poverty had virtually disappeared; the Gini coefficient decreased from 0.45 to 0.42. Throughout this period the share of government expenditures going to agriculture was 50 percent higher in Thailand than in the Philippines.

While many factors underpin these divergent patterns, the contrasting experience of Thailand and the Philippines illustrates that *rapid* urbanization is neither necessary nor sufficient for rapid poverty reduction.



Rural income growth in East Asia between 1992 and 2003 accounted for three quarters of the 13 percentage point decline in the \$1 a day poverty rate; rural-urban migration for one fifth, and urban income growth for about 5 percent. While this decomposition does not account for the indirect effects of urbanization on rural incomes through urban-rural remittances and tightening rural labor markets following urban migration, the share of rural income growth in explaining the poverty decline is so large that it is safe to assume that it overwhelms these indirect effects. Moreover, the decomposition assumes that migrants have the same characteristics as the rest of the population, while they are usually less poor and more entrepreneurial, resulting in an overly optimistic attribution of the poverty decline to migration.

Econometric decompositions from China (Ravallion and Chen, 2007) indicate that rural income growth accounts for all the poverty reduction over the past decades. This is consistent with econometric evidence from other transforming and urbanized countries (respectively India and Mexico). Complementing urbanization policies with those that foster rural income growth holds most promise.

1.4. Both agriculture and the rural non-farm sector drive rural poverty reduction

The potential of agriculture to contribute to rural poverty reduction differs across countries. In China, where land is relatively equally distributed, the reduction in poverty was 3.5 times higher from GDP growth originating in agriculture than from GDP growth originating in industry or services (Ravallion and Chen, 2007). Rapid agricultural development is likely to remain an important pathway out of poverty for many of Vietnam's poor as well (van de Walle and Cratty, 2004). Econometric evidence from the Philippines also shows that growth in agriculture is more poverty reducing than growth in industry (Balicasan and Fuwa, 2004).

But the rural nonfarm sector is also growing rapidly. Rural households in Vietnam and Indonesia obtained 57 percent of their income outside agriculture in 1998 and 2000 respectively. In Indonesia (as in India), growth in rural services was estimated to contribute at least as much to rural poverty reduction as growth in agriculture (Suryahadi, Suryadarma, and Sumarto, 2006; Ravallion and Datt, 1996). Rural nonfarm employment growth is often related to agricultural growth through forward linkages. Rural trading and transport, often of food, make up about 30 percent of rural nonfarm employment. As agriculture grows and diets diversify, it further generates employment in the agro-processing industry. Urban overcrowding and higher urban labor costs have also stimulated urban-to-rural subcontracting, as in China's rapidly developing town and village enterprises. Many of the public investments necessary to

foster the rural non-farm economy, such as a sound rural investment climate, rural infrastructure and education, also benefit agriculture and vice versa.

1.5. Changing food habits open up exciting new growth opportunities for agriculture

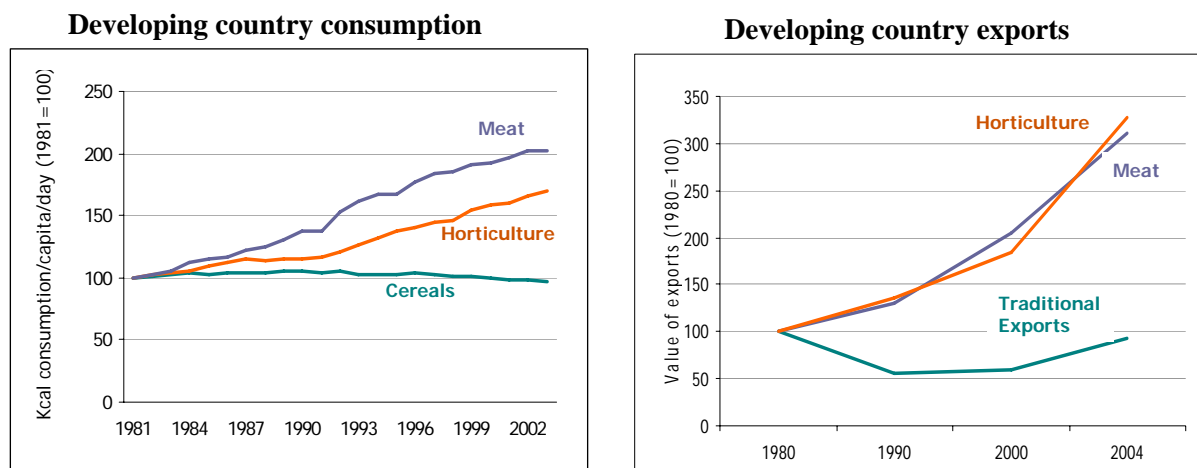
Rising incomes and urbanization are shifting the composition of domestic food expenditure from basic and unprocessed staple foods to meat, horticulture and processed foods (Figure 4). In 2005, Indonesians spent on average about as much on rice (and other cereals/tubers) as on prepared foods—one fifth, down from 39 percent in 1980. Fruits and vegetables are one of the fastest growing agricultural markets in East Asia, with fruit and vegetable production increasing respectively by 7.3 and 6.1 percent a year during 1980-2004. Relative to cereals, horticulture increases the returns to land about 10-fold and requires twice as much labor input per hectare. It generates more off-farm jobs in processing, packaging, and marketing. The EAP countries are also undergoing a livestock and aquaculture revolution. Production of meat (especially pork and chicken, which make up almost 80 percent of total meat production) increased by 6.7 per cent per year during 1980-2004. Aquaculture increased at an annual rate of 10 percent since the mid 1980s.

Globalization and changing consumer tastes for specialty products and year-round supplies of fresh produce in industrial countries have also opened up new export opportunities (Figure 4). In 2005, China emerged as the fourth largest world exporter of apples (in US\$) in the world. The rising demand for feed grains reinforced by the shift to intensive (stall fed) livestock production provides opportunities for countries with abundant land resources (Laos and Cambodia). Biofuels based on oil palm are being actively explored by Indonesia and Malaysia (although the profitability of some current production methods, environmental issues, limited employment generation, and the prospect of alternative technologies based on cellulose rich materials such as crop residues and wood chips, make biofuels' future growth quite uncertain).

1.6. But new (and old) agriculture also face new challenges

Economies of scale in processing and marketing, and consumer demands for quality are spurring the vertical integration of supply chains led by specialized agribusinesses and supermarkets. Helping poorer farmers connect to these new markets poses an important policy challenge. In Indonesia, the share of fresh fruit and vegetables retailed in supermarkets is still low (10-15 percent), but up from almost zero a decade ago. A rapid penetration by supermarkets is likely at the doorstep of the EAP countries, as in Latin America where supermarkets exceed 50 percent of retail food sales in many countries. Poorer smallholders also face challenges

Figure 4: Diet diversification out of staples provides new growth opportunities for agriculture in developing countries, at home and abroad.



Source: World Development Report 2008.

in connecting to the growing market for meat and dairy because of economies of scale in intensive chicken and pork production and quality concerns. Horticulture and intensive animal husbandry bring new environmental challenges. Horticulture already accounts for 28 percent of global pesticide consumption and the growing concentration of animals near urban and peri-urban areas increases waste pollution and the incidence of diseases such as tuberculosis and avian flu.

There are also rising uncertainties regarding future world food supplies and prices. For the first time in decades, projection models predict a slight annual increase in world food prices till 2030. Most recently, maize, wheat, and rice prices have gone up by 35 to 53 percent compared to 2004, in part due to biofuel policies in the United States and the European Union. In most EAP countries (except Lao and Cambodia) the land frontier has been closed, while population growth and urbanization continue to reduce the area available for agriculture. Cereal yield gains from the Green Revolution package of modern varieties, fertilizers and irrigation have been largely materialized. Improved varieties of cereals are already planted on more than 80 percent of the cultivated area. The experimental rice yield potential has been growing by less than 1 percent a year over the last decade, down from 2-3 percent during 1960-1985. With an estimated 500 million people in EAP living in absolute water scarcity, maintaining irrigated food production through large extractions of water from rivers or the ground is unsustainable. Climate change, high energy prices and the related expansion of biofuels using agricultural feedstocks, further add to the uncertainties. Increased investment in technological innovations and environmentally sustainable soil and water management

practices will be necessary to sustain EAP's historically stellar cereal yield growth.

2. East Asia's emerging agriculture-for-development agenda

The objective of East Asian policy makers is to reduce rural poverty and overcome rural-urban income disparities through policies that are feasible, effective and environmentally sustainable. Three important policy entry points include: 1) increasing agricultural productivity by going beyond the Green (staple crop) Revolution towards more sustainable and high value agriculture, 2) promoting off-farm employment and urban migration, and 3) better assisting subsistence farmers and populations in lagging areas. Avoiding pressures to introduce new agricultural protection and input subsidies and properly align the price of environmental inputs such as water with their real costs remain a challenge.

2.1. Moving beyond the Green Revolution to more sustainable and high value agriculture

Four challenges in increasing agricultural productivity are: 1) expanding the share of high value agriculture, which yields higher returns per area than cereals, while continuing to increase the absolute output of staple crops; 2) increasing staple crop yields especially through more investment in demand driven agricultural R&D and extension systems; 3) strengthening farmers' risk management capacity, especially given concerns about climate change; 4) making agricultural production systems environmentally sustainable.

Table 1: Public and private options for strengthening farmer links to the market

Issue	Public sector		Private sector
	Public investments	Policy environment	
Lack of access to markets	<ul style="list-style-type: none"> Invest in education, rural infrastructure (roads, electricity, irrigation); support formation of producer organizations 	<ul style="list-style-type: none"> Liberalize domestic trade; foster development of input and credit markets 	<ul style="list-style-type: none"> Assist farmers in forming producer organizations
Weak technical capacity	<ul style="list-style-type: none"> Support market-oriented extension 	<ul style="list-style-type: none"> Foster the environment for private extension participation 	<ul style="list-style-type: none"> Provide extension and key inputs to farmers
Meeting quality standards	<ul style="list-style-type: none"> Support farmer training on good agricultural practices for quality enhancement and food safety 	<ul style="list-style-type: none"> Establish grades and standards 	<ul style="list-style-type: none"> Supply inputs and train farmers on quality management and food safety
Meeting contract conditions	<ul style="list-style-type: none"> Train firms in contract design and management; train farmers on their rights and obligations 	<ul style="list-style-type: none"> Foster institutions for dispute resolution; strengthen producer organizations 	<ul style="list-style-type: none"> Foster trust; develop contracts that are self-enforcing
Farmer exposure to risk	<ul style="list-style-type: none"> Development of commodity and futures exchanges; train firms on use of market instruments to hedge risk 	<ul style="list-style-type: none"> Create enabling environment for insurance market 	<ul style="list-style-type: none"> Use contracts that share risk equally among parties; assist farmers to access insurance

Source: World Development Report 2008.

Expanding high value agriculture and opportunities for smallholders

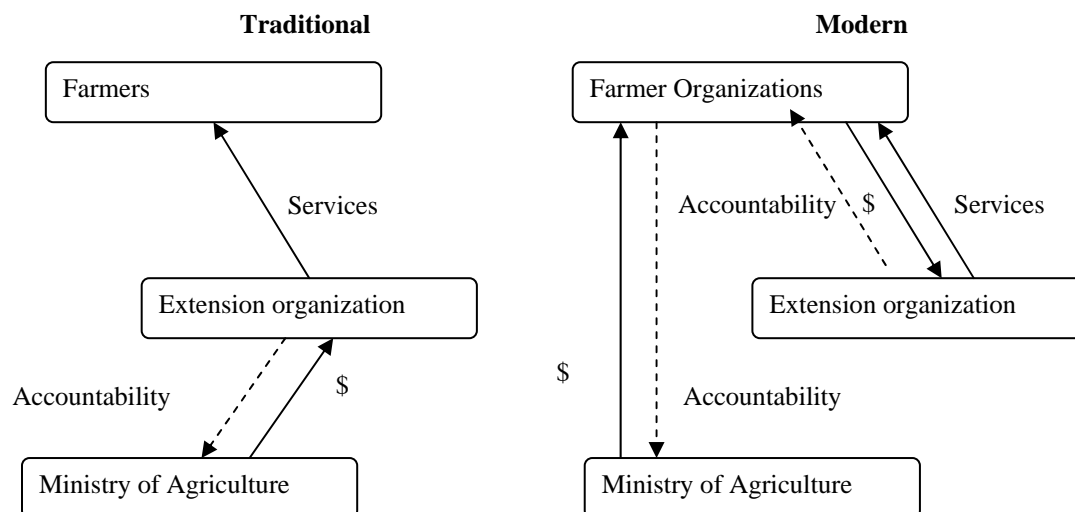
Success in high value agricultural markets requires a good investment climate as well as good regulatory institutions to ensure compliance with international sanitary and phytosanitary (SPS) standards (an issue driven home by China's recent problems with food safety standards). This is an issue of great concern to East Asian economies. Several studies and projects have been initiated (as in Vietnam and Laos) to achieve SPS compliance through joint public and private efforts, with the public sector focusing on standards, food safety legislation and disease surveillance and the private sector looking at training and monitoring compliance. Despite worries that the cost of compliance disadvantages developing countries studies suggest they tend to be small, with fixed costs 0.5 to 5 percent of three-to-five year exports and variable costs only 1 to 3 percent of annual exports. Developing countries can also draw support from the Standards and Trade Development Facility to strengthen local capacity to meet the SPS standards.

Poorer farmers often find it hard to exploit opportunities in high value agriculture because of lack of education, inadequate access to irrigation water free of contaminants, and poor access to key infrastructure and capital goods, such as cold chains, greenhouses, packing

sheds, roads, and vehicles, all things that pose important threshold investments. There are a number of things that the government and the private sector can do to help smallholders meet the requirements of supermarkets and other coordinated supply chains, mainly by fostering institutional innovations such as contract farming, the promotion of producer organizations, and public-private partnerships (Table 1). Government extension agents can for example join forces with supermarket field staff to strengthen the technical capacity of farmers to acquire inputs, obtain certification, and improve quality and food safety. Normincorp, a marketing company in the Philippines, links farmers directly to buyers for a 6 percent facilitation fee. It procures vegetables for the fast-food industry, supermarkets and vegetable processors from production clusters of 10 small farmers allied with a commercial lead farmer responsible for overall quality control. The clusters commit themselves to undertake a common production and marketing plan.

Increasing staple crop yields through investment in agricultural R&D and extension

Despite high estimated returns to agricultural R&D—on average 50 percent in Asia across 222 studies—agricultural research remains largely underfunded. Public spending on agricultural R&D averaged 0.4 percent of agricultural GDP in Asian

Figure 5: Financing for extension services, the traditional and the new approach

Source: Chipeta, 2006.

countries in 2000—42 percent coming from China. This compares with 0.53 percent in developing countries and 2.36 percent in high income countries. With the exception of Brazil, China and India that doubled or tripled their public spending on agricultural R&D between 1981 and 2000, most countries reduced public spending on agricultural R&D. Regional and global partnerships to enable small and medium size countries and research organizations to capture the economies of scale in research can be very powerful. In addition to the Consultative Group on International Agricultural Research (CGIAR), one of agriculture's global success stories, other regional initiatives such as FONTAGRO, the Regional Fund for Agricultural Technology for Latin America and the Caribbean are also proving successful. Farmer organizations can play an important role in promoting more demand-driven R&D, as demonstrated by the PRODUCE foundations, created by farmer NGOs in Mexico, that leveraged funds for cash-strapped national agricultural research stations. Above all, it will require political will to invest more in economically effective, but risky and less visible instruments with a long term pay-off (10 years or more).

More demand driven extension systems through the decentralization of extension services and by making extension service providers directly accountable to the farmers can facilitate faster adoption of new technologies (Figure 5). The active involvement of farmers at district and subdistrict levels in setting priorities for extension activities by the Agricultural Technology Management Agencies in India since 2000 increased farmers' incomes by an estimated 25 percent. The declining costs of and increased access to information technologies also provide fascinating new avenues. Increasingly, extension services

are also provided through mixed public-private systems, involving farmer organizations, NGOs, and public agencies contracting out extension services, as in Uganda.

Strengthening farmers' risk management capacity

Farming is a risky business, with climate change further exacerbating uncertainty. Weather-indexed insurance schemes can help farmers better manage weather related risks with payouts triggered if a specified weather event passes a given threshold (e.g. rainfall falls below a certain level). Indexing to events that cannot be influenced by individuals helps overcome moral hazard and adverse selection issues that have plagued the implementation of agricultural insurance everywhere. In a private livestock insurance scheme, currently being tested in Mongolia, herders pay a premium for the base insurance product, which pays an indemnity to individual herders whenever the livestock mortality rate in a local region exceeds a threshold. Private insurance companies are reinsured by the government.

Such indexed insurance programs are promising, but it is not yet possible to draw definite conclusions about their sustainability or impact on farmers' technology and portfolio choices. Governments should also watch the distributional implications of these schemes. The poorest households may not be willing to pay the premiums because they are credit or liquidity constrained, as observed in studies from India and Tanzania, as well as other insurance markets. Targeted subsidies may be considered for variable costs, especially when insurance premiums are less costly than ex post assistance. Subsidies can also offset the fixed costs of establishing a market. Other adaptation measures include

development of flood-, heat-, and drought-resistant crops, and better climate information.

Improving the environmental sustainability of agricultural systems

More crop per drop. Present patterns of water use in many areas are not sustainable. Irrigation currently uses an average of 70-80 percent of the available fresh water, with an efficiency rate of only 50-60 percent, while demand for water for urban, industrial and environmental needs is rising. In South-East Asia, better integrated river basin management is currently pursued under the Mekong River Basin Water Partnership Program (MWARP) to better allocate water across sectors. More efficient water use in irrigation requires setting charges for water and power that reflect their actual cost. Recent experience in China in the Tarim Basin demonstrated that a shift from area based to volume based charges for irrigation water resulted in a 17 percent decrease in water use. Nonetheless, better cost recovery remains a challenge everywhere because of vested interests and measurement problems. It usually works better when the governance of irrigation systems is decentralized. Farmers are also more willing to share the cost of services when it is accompanied by modernization of irrigation schemes to facilitate the more flexible water management needed for production of vegetables for urban markets. New technologies for better measurement are also becoming available such as automated channel control of irrigation as applied in Australia and remote sensing to measure soil moisture content and evapo-transpiration of crops in the field.

Greening the Green Revolution. The environmental damage from fertilizers through runoff can be reduced through better timed application of fertilizer, precision farming (using geographic information systems), introduction of nitrogen fixing legumes in the farming system, and low-tillage farming, as in the Indo-Gangetic Plain in India where wheat is immediately planted after rice without tilling, taking maximal advantage of the left over moisture. In China use of insect resistant Bt-cotton reduced pesticide application by two thirds and raised net incomes by US\$ 470 per hectare (or 340 percent). Nonetheless, the adoption of integrated management practices (including integrated pest management) has been slow. Subsidies for water and electricity distort the real cost. Integrated management also requires adaptive, knowledge intensive extension services that capture the complex interactions characterizing eco-systems.

Animal waste management. Poultry and pork producers have an incentive to concentrate in urban and peri-urban areas so as to reduce transport costs. This is causing pollution of water and soil with animal wastes, especially nitrogen and phosphorous, but also highly toxic heavy metals such as cadmium, copper, and zinc from animal feed additives. Thailand, a major player in the

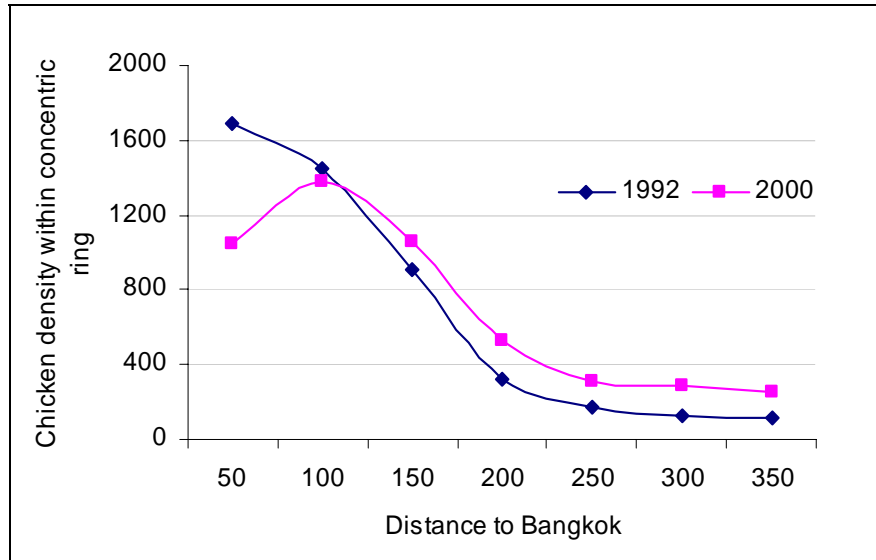
global poultry market—more than 500 million tons of exports in 2003—managed to drastically reduce the concentration of poultry around Bangkok (Figure 6) through taxation. Poultry farmers close to Bangkok had to pay high taxes; those outside the zone enjoyed tax-free status. Regulations such as a minimum distance between farms (Spain) or between farms and the nearest waterway (Brazil) have also been used to manage animal waste. Dense livestock populations increase the risks of spreading animal diseases, some of which may cross-over to humans. The rapid creation of disease-free zones, in response to an avian flu outbreak in 2003 in Thailand, with strictly enforced movement control and thousands of inspectors going door to door to search for diseased animals has been critical in stemming its spread.

2.2. Moving beyond the farm

A buoyant rural non-farm sector is equally critical to facilitate the transition out of agriculture and reduce the rural urban divide. In Indonesia, migrants to jobs in urban areas tend to be better-off rural non-farm workers who were already doing non-farm jobs in rural areas. Less-well-off rural people tend to have stronger income growth when moving relatively small distances (within a sub-district). Given such constraints, one of the best prospects for reducing rural poverty is the potential for rural residents to commute to jobs in nearby towns, while retaining their rural residence and their foothold in farming. In northeast Thailand, the greater availability of non-farm jobs in nearby rural towns led to significant improvements in income.

Studies of the rural investment climate reveal as major constraints in generating off-farm employment lack of well-functioning institutions, poor access to and high cost of credit, inadequate supply of electricity and poor quality roads. In addition rural firms often face low market demand for their goods, the major constraint in Indonesia and Vietnam. The dependence of the rural non-farm economy on local markets links their profitability to local incomes and thus to the factors constraining local agricultural productivity. The establishment of local aggro-based clusters around rural towns can help capture economies of agglomeration and could be fostered through public private partnerships. Indeed, small and intermediate rural towns often act as engines of non farm employment growth further away from large urban centers, including through jobs in sectors that provide services for local agriculture. Market demand can also be expanded by better roads and communications that link rural areas to the urban economy, facilitating subcontracting of labor intensive manufacturing to rural areas close to the cities.

Continued investment in rural education is critical to help poor households find good jobs outside agriculture. Skills remain the principal dividing line between higher paying non-farm jobs and lower paying agricultural ones. In the EAP region (exclusive of China),

Figure 6: Thailand is shifting the concentration of poultry away from Bangkok

Source: Steinfeld and others, 2006.

young male rural workers between 18 and 25 years old have about 2.1 years less education than their urban counterparts; for women the average gap is 2.4 years. Active labor market programs can also assist households migrate out of poverty. A job-matching program for migrants in China provided off-farm employment to about 200,000 upland laborers over six years. The program provided on-the-job training by enterprises. A computerized, demand-driven job placement system emphasized local markets, monitored worker safety and living conditions, and reported abuses and grievances. Migrant women's outlook on life greatly improved.

2.3 Assisting subsistence farmers and populations in lagging areas

Despite rapid overall growth, some populations are being left behind, especially in less-favored areas. East Asian countries are therefore ramping up special poor area development programs. These include Vietnam's P-135 projects aimed at reducing poverty among ethnic minorities and in mountainous areas where poverty rates are much higher, and the Mindanao project in the Philippines. Such interventions prove not only to be politically effective, but also economically efficient. Econometric studies from China, Thailand, India and Uganda show that public investments in certain types of agricultural R&D, rural roads and education can produce competitive returns in lagging areas (Fan, forthcoming). Successful programs combine local agricultural development, better use of environmental services, investment in skills for migration and wide safety nets.

Experience of projects in two of China's poorer provinces, Gansu and Inner Mongolia, indicates the

continued importance of agriculture in developing lagging rural areas. Per capita grain output rose by almost 50 percent following adoption of better agronomic practices and contributed to the increase in net income per capita of more than 50 percent between 1999 and 2004.²⁹ Most of the incremental output was sold in the market. Successful programs put local communities in the driver's seat as in Vietnam and focus on improving technologies for sustainable management of land, water and biodiversity. Water harvesting and small scale irrigation schemes, and agro-forestry, sometimes integrated with livestock, are also promising. In Latin America, payments for environmental services (PES) such as carbon sequestration, harboring biodiversity, and retaining forests are increasingly popular, providing additional sources of revenue. Secure long term property rights and effective land rental markets are necessary for investment in sustainable resource management. They also facilitate occupational transformation and help transfer land to the more productive producers, as in China where decentralized rentals have by now mostly replaced administrative reallocations. While almost 60 percent of those renting out land in China relied on agriculture as main source of income before entering rental markets, only 17 percent continued to do so afterwards; 55 percent migrated, and 29 percent went into local non-farm

²⁹ Two thirds of this increase came from yield increases, the rest from land expansion. The household income structure did not change, with about 70 percent still coming from agriculture (with 60 percent from crop planting, and a quarter from animal husbandry). Better agricultural technology (rather than migration) underpinned the dramatic improvement in living conditions among these rural households. The poverty headcount declined by more than 10 percentage points.

activity. Net revenue on rented plots rose by about 60 percent.

Public investment in rural education and vocational training helps younger farmers migrate out of agriculture, another pathway out of poverty for subsistence farmers in lagging areas. Successful programs include conditional cash transfers such as Mexico's Oportunidades and Brazil's Bolsa Familia that transfer cash conditional on regular school attendance. This helps children stay in school, breaking the vicious circle of intergenerational poverty. Remittances from migrants often provide an important source of income for those staying behind and policies that reduce the transaction costs on remittances and encourage investment in the local economy should be pursued.

Other safety nets can help reduce vulnerability and assist the many households unable to migrate (the elderly and less educated) or those without migrant household members. Flexible, countercyclical public employment and relief programs such as India's Maharashtra Employment Guarantee Scheme and Argentina's Trabajar program have been successful in helping households cope with income shocks. Rural noncontributory pensions have been introduced in countries in Latin America and Europe and Central Asia.

3. Agriculture for development in the 21st Century

Even though poverty has fallen dramatically, the rural-urban income divide in East Asia has increased. More than 90 percent of the poor in EAP live in rural areas now, the vast majority earning their living in agriculture. More rapid growth in the rural economy both on and off the farm provides good prospects for accelerating poverty reduction and tackling the rising rural-urban divide. A three-pronged "agriculture for development" approach is emerging. This approach focuses on increasing agricultural productivity by expanding beyond the Green Revolution towards more sustainable and high value agriculture, drawing on institutional and technological innovations. It fosters rural employment off the farm through a better investment climate and regional and secondary town development. And, it bolsters poor area development programs through a combination of agricultural development and environmental services, education for migration, and wide safety nets for those remaining behind.

Successful implementers of this agenda are pursuing multi-sector, decentralized, and participatory approaches that redefine the role of the state, the private sector and civil society. A major challenge is to avoid the pitfalls of increasing agricultural protection and subsidies, something currently observed in many EAP countries. These are not only economically detrimental in the short run but also difficult to remove once established. Instead, a focus on the provision of public goods such as a better

investment climate, more demand driven agricultural R&D and extension, increasing rural infrastructure and rural education holds most promise in accelerating poverty reduction and addressing the rural-urban divide.

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