CHAPTER 3. UNEQUAL BENEFITS OF GROWTH – AGRICULTURE LEFT BEHIND

Rapid economic growth and good macroeconomic fundamentals are hallmarks of the Asia-Pacific region. The share of people living on less than $1 a day fell from 29% in 1990 to 18% in 2004, and more than 300 million people have escaped poverty since 1990. But despite this success, fault lines are apparent. Of the world's poor, 641 million still live in Asia-Pacific – nearly two-thirds of the global total, mainly in rural areas. Based on recent estimates, countries in South Asia are either slow or regressing in pursuing the Millennium Development Goal of reducing the number of people living on less than $1 a day by 2015 (ESCAP/ADB/UNDP, 2007). The rural poor account for around 70% of the poor in the Asia-Pacific region, and agriculture is their main livelihood.

> *"Agriculture appears neglected, despite providing jobs for 60% of the working population in the region"*

Another worrisome trend: the gap is widening between the rich and the poor, because the benefits of growth are not shared equally by different sectors, regions or income groups. Agriculture appears neglected, even though it still provides jobs for 60% of the working population in Asia-Pacific and generates a quarter of the region's GDP. Growth and productivity in agriculture are slowing, and the green revolution has bypassed millions. The mounting pressure on farmers is evident in declining subsidies, rising input prices, protests over landlessness and an alarming number of suicides among the indebted.

This chapter diagnoses Asia's waning agriculture and assesses the impact of agricultural productivity growth on poverty. Raising average agricultural labour productivity in the region to that in Thailand could take 218 million people out of poverty, a third of the poor. Large gains are also possible through comprehensive liberalization of global agricultural trade, with the region poised to take another 48 million people out of poverty.

The chapter next analyses agriculture's role in reducing poverty and inequality. It finds that agriculture has been static for many years since the green revolution. Diversifying into high value crops, so far confined to a few countries, is something the region could bank on in coming decades. But agriculture alone will not lift Asia-Pacific's 641 million poor people out of poverty. Developing the non-farm sector is equally important.

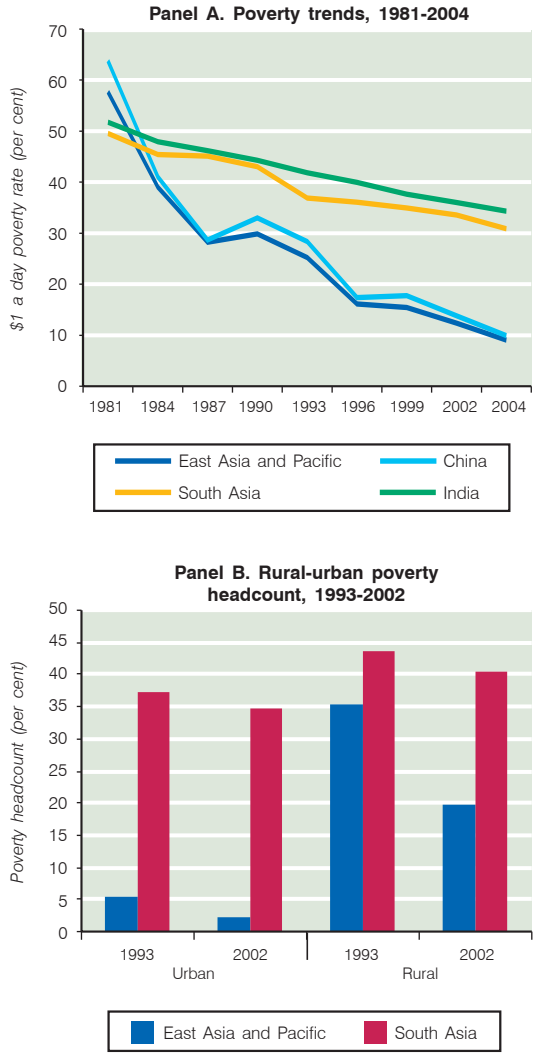
The chapter then proposes a two-pronged strategy to make agriculture economically and socially viable, returning it to its place reducing poverty and inequality.

- First, agriculture needs another revolution. A market orientation with a focus on quality and standards would be part of this strategy. Investments in Research and Development and human capital will increase agricultural productivity significantly. Also needed are revamping land policies, connecting the rural poor to cities and markets, and making credit instruments and crop insurance farmer-friendly.
- Second, facilitating migration out of agriculture should complement agricultural development – by empowering the poor, particularly women, with the skills to tap labour market opportunities and by promoting rural non-farm activities and regional growth centres.

Public policy should support both tracks by levelling the playing field for poor and rich.

Diagnosing Asia-Pacific's waning agriculture

Figure 3.1. Slowing declines in poverty since the 1980s, with progress mainly in urban areas



Source: Based on data from S. Chen and M. Ravallion, "Absolute poverty measures for the developing world", World Bank Policy Research Working Paper No. 4211 (Washington, D.C., World Bank, 2007).

The Asia and Pacific region is at the forefront in reducing poverty, cutting the number of poor living on less than $1 a day from 1.25 billion in 1981 to 641 million in 2004 – a decline of around half. Compare that with a reduction of 2% in Sub-Saharan Africa and an increase of 20% in Latin America. Asia-Pacific's success is attributable mainly to China, where the poverty rate fell from 63.8% in 1981 to 9.9% in 2004, taking more than a half billion people out of poverty.

Poverty declines are slowing, and rural poverty remains stubbornly high: A lethargic agriculture?

The decline in poverty has slowed since the late 1980s (figure 3.1, panel a). In China, half the aggregate decline was in the first half of the 1980s (Ravallion and Chen, 2007). In India, only 6 million people were taken out of poverty after 1999, a period of rapid economic growth.

The reductions have been mainly in urban areas (figure 3.1, panel b). In East Asia and the Pacific, urban poverty fell by almost 50% during 1993 and 2002, rural poverty by 44%. In South Asia, urban and rural poverty each fell by a meagre 7%. Growth has been concentrated in cities and regions where infrastructure and basic service delivery are superior. In Sri Lanka, half the GDP is generated in the western province, indicating a huge regional disparity (Central Bank of Sri Lanka, 2007). In China, most growth is in the eastern coastal belt, while contributions from the central and western regions are substantially lower (Ravallion and Chen, 2007).

The slowing poverty reduction is a result of the neglect of agriculture, which is the focus of the rural sector. Agriculture's lethargy has broken agricultural growth's historically strong contribution to reducing poverty.

Growth in agricultural value added had the largest impact on poverty reduction in Asia in the 1970s and 1980s. That impact has since been waning (figure 3.2). Consider this: a 1% increase in agricultural value added growth in Asia led to a nearly 0.6% reduction in poverty in the 1970s, compared with a 0.1% reduction by manufacturing value added growth and –0.1% by services growth. But agriculture's impact declined to around 0.1% in the 1980s and 1990s, about the same as manufacturing's.

What drives this outcome? One factor is the low productivity of agricultural labour.

Productivity in industry and services increased more rapidly. And the number of people whose livelihood depends on agriculture did not decline as rapidly as the share of agriculture in GDP (figure 3.3). So, less income in agriculture had to be shared by more people. In addition, the land Gini coefficient is high in many developing countries of the region, implying that the income generated in agriculture is not shared equitably.

> *"The share of agriculture in GDP is declining fast – as is policy attention"*

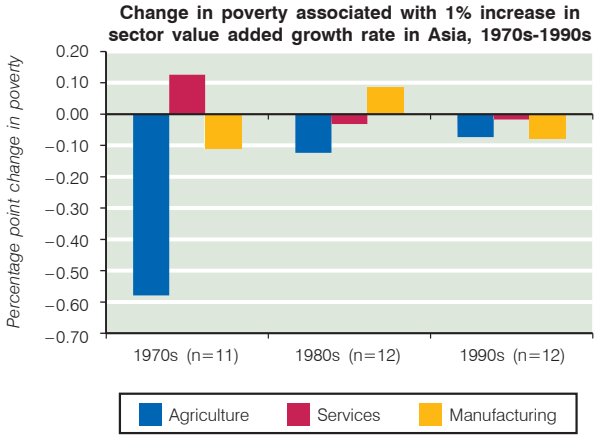
The share of agriculture in GDP has declined due to low productivity (figure 3.4). Low product prices and high input prices have also made agriculture less attractive. The result: low growth in agriculture and lower incomes for the people dependent on it (table 3.1). In South Asia, growth in agricultural output dropped from 3.6% in the 1980s to 3.0% in 2000-2003. Underlying this trend are India's low crop yields, the result of limited investment in research and extension beyond the early green revolution years. Growth in agriculture dropped even more rapidly in East Asia and the Pacific, from 4% in the 1980s to a mere 0.1% in 2000-2003. The benefits of green revolution technologies have largely been exploited, with little room for further gains without new technological infusions (FAO, 2006a).

The role of agriculture in creating jobs is diminishing in some subregions

Although agriculture is still the largest employer, its capacity to generate new employment is falling. In East Asia, South-East Asia and the Pacific, it now has less employment potential than industry or services (table 3.2). In South Asia, it has the highest potential for generating employment, but even there the employment elasticities in agriculture have plunged in recent years.[1]

[1] Except in Bangladesh, employment elasticities in South Asia declined from the 1980s through 2004 (SAARC, 2005).

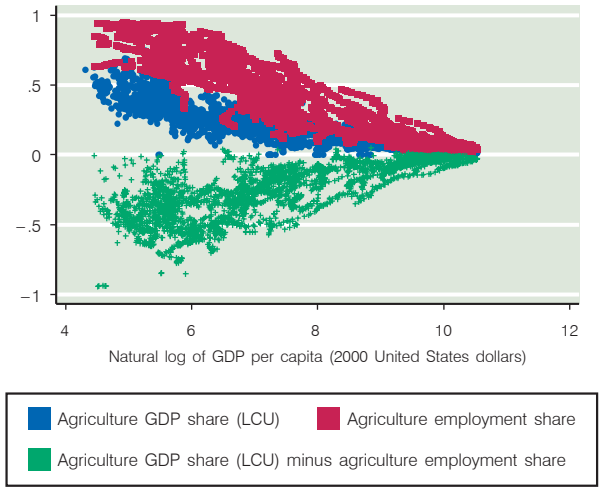
Figure 3.2. Agricultural growth's contribution to poverty reduction has slowed since the 1970s



Source: N. Majid, "Reaching Millennium Development Goals: how well does agriculture productivity growth reduce poverty?" Employment Strategy Papers, No. 2004/12 (Geneva, ILO, 2004).

Note: Based on ordinary least squares regression with Sala-i-Martin poverty data. *n* refers to the number of countries in the sample.

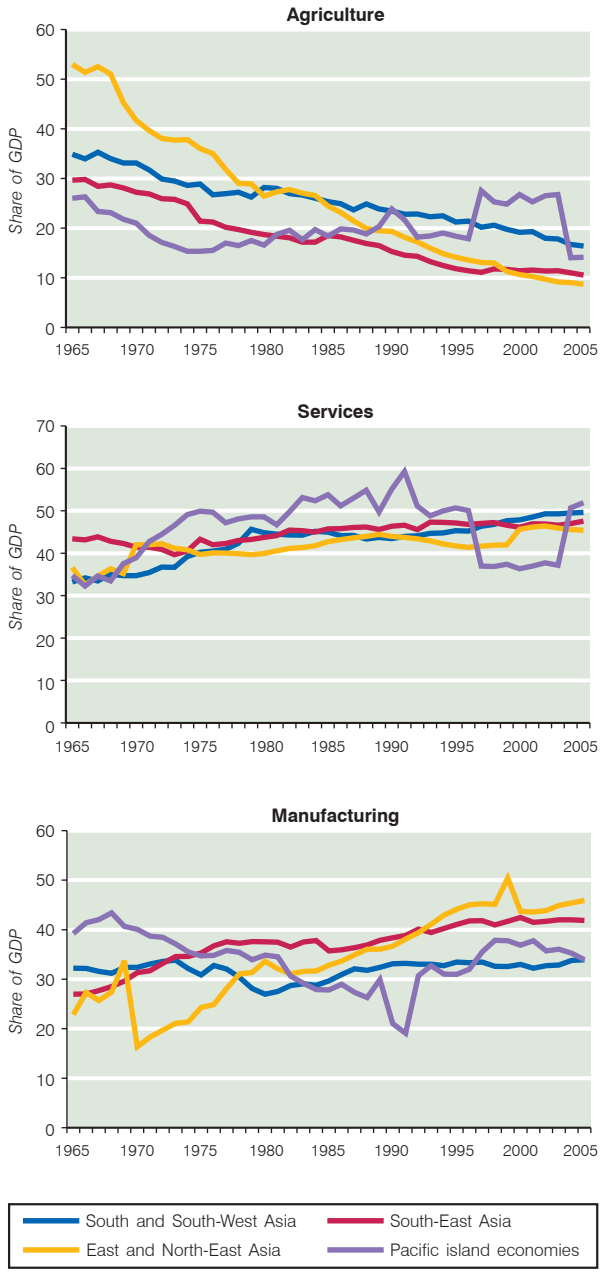
Figure 3.3. The changing share of agriculture in GDP and employment



Source: C.P. Timmer, "Agriculture and pro-poor growth: An Asian perspective", Center for Global Development, Working Paper No. 63 (Washington, D.C., CGD, 2005).

Figure 3.4. A declining share of agriculture's value added in GDP

(Per cent)



Source: Based on data from World Bank, *World Development Indicators 2007* (CD-ROM) (Washington, D.C., World Bank, 2007).

Structural changes in production – in response to productivity gains and opportunities from globalization – appear to have hurt agriculture. Value addition in industry and services is several times that in agriculture. So, agriculture's share in GDP fell from 53% in 1965 to 9% in 2004 in East and North-East Asia, from 35% to 17% in South and South-West Asia, and from 30% to 11% in South-East Asia.

Inequality is widening due to the neglect of agriculture

The region's impressive gains in economic growth and poverty reduction came with a sharp increase in inequality since the 1990s. Only Thailand, Malaysia and Indonesia reduced income inequality, while most countries experienced sharp increases (figure 3.5, panel a). The main reasons? Low and stagnant agricultural productivity, lack of rural infrastructure, incomplete land reform, poor basic service delivery and limited alternative income-generating activities – and thus low incomes for the majority of the rural workforce. Moving away from agriculture is associated with widening income inequality (figure 3.5, panel b). Such inequality may impede growth and threaten social cohesion by leaving people's skills idle.

With limited resources, farmers depend on borrowed money to purchase seeds and other inputs and to farm their land (box 3.1). A drop in their farm income could lead to indebtedness. In India, for example, the distress in rural areas is reflected in the high number of suicides by farmers: 86,922 during 2001-2005 (Government of India, 2007). Sharma (2004) puts the blame on a shift towards commercial agriculture and more liberal imports. Farm debts and suicides are also reported in China (BBC News, 2007), Sri Lanka (MONLAR, 2005) and Thailand (Asian Farmers Association for Sustainable Development, 2007).

Agricultural labour productivity growth is declining, and productivity gaps remain wide

Asia-Pacific's average annual agricultural labour productivity growth of 2.5% in the 1980s dropped to 2.2% in the 1990s and to 1% during 2000-2002. The main culprits were stagnating productivity growth in South-East Asia, after it reaped the benefits of the green revolution in the 1970s and 1980s, and South Asia's slow progress in catching up. Even within Asia-Pacific, productivity gaps remain wide (figures 3.6 and 3.7). On the back of China's rapid technological progress in

Table 3.1. Agricultural and non-agricultural growth rates

(Average annual percentage, 1960-2003)

	Agriculture					Non-agriculture				
	1960s	1970s	1980s	1990s	2000-2003	1960s	1970s	1980s	1990s	2000-2003
South Asia	2.9	1.7	3.6	3.2	3.0	5.7	4.7	6.4	6.2	5.9
East Asia and Pacific	4.0	3.2	3.0	1.7	0.1	7.7	7.4	4.9	5.1	5.0
Europe	1.2	1.7	2.0	1.7	−0.8	6.0	3.5	2.6	2.5	2.3
North America	..	−0.3	3.2	2.7	−1.8	..	3.7	2.7	2.7	3.2

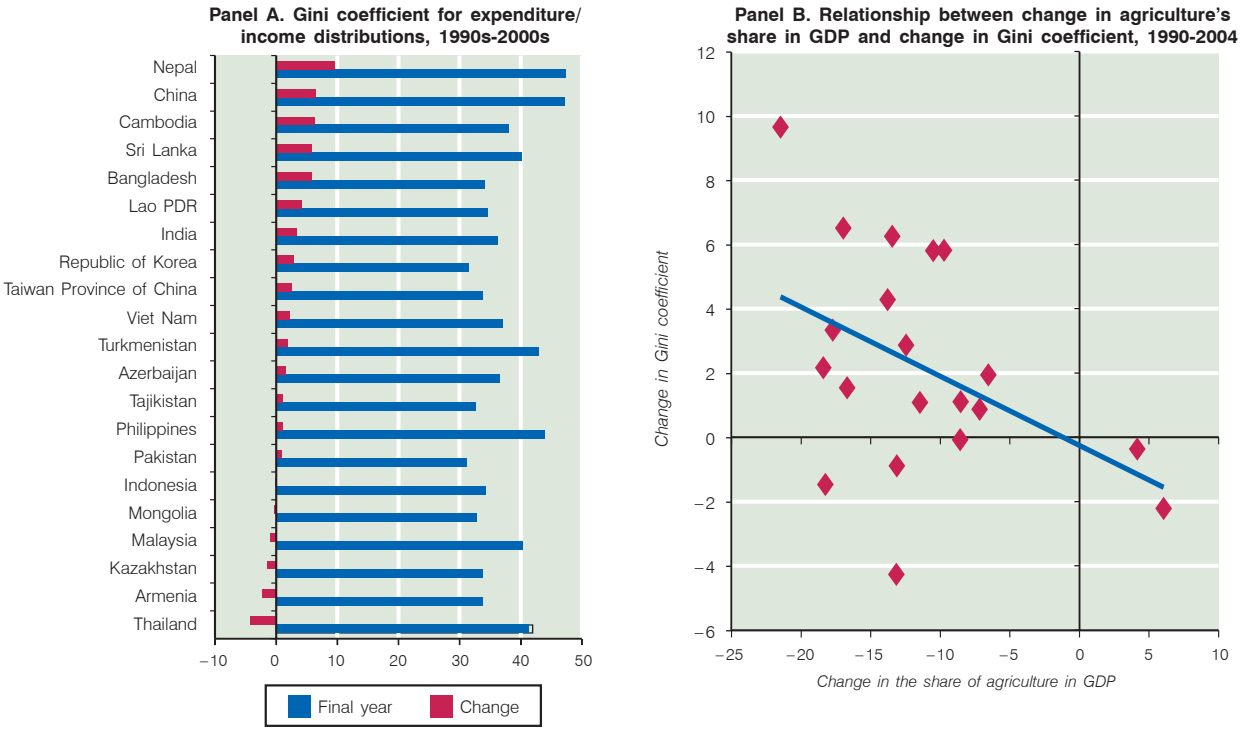
Source: Based on data from L. Christiaensen, L. Demery and J. Kuhl, "The role of agriculture in poverty reduction", World Bank Policy Research Working Paper No. 4013 (Washington, D.C., World Bank, 2006).

Table 3.2. Sectoral employment elasticities, 1991-2003

	Agriculture		Industry		Services	
	Elasticity	Value added growth	Elasticity	Value added growth	Elasticity	Value added growth
East Asia	0.23	3.7	0.06	12.5	0.50	8.8
South-East Asia and Pacific	0.20	2.1	0.68	5.4	0.99	4.6
South Asia	0.71	2.9	0.37	5.9	0.36	6.9

Source: Based on data from ILO, *Key Indicators of the Labour Market 2007 Database, 5th Edition* (Geneva, ILO, 2007).

Figure 3.5. Income inequality and its relationship with the change in agriculture's share in GDP



Sources: Based on data from ADB, *Key Indicators of Developing Asian and Pacific Countries 2007* (Manila, ADB, 2007); and World Bank, *World Development Indicators 2007* (CD-ROM) (Washington, D.C., World Bank, 2007).

Box 3.1. Growing farm debt, increasing distress in Indian agriculture

Rising farm debt and its tragic consequences are major concerns in many developing countries in the region. Perhaps India is the best example where this phenomenon has been studied in depth and brought to the attention of senior policymakers.

According to a recent report (Government of India, 2007), Indian agriculture faces a crisis from debt, especially since the mid-1990s, evident in the large number of farmer suicides in some regions. Of the estimated 89.3 million farmer households in 2003, 43.42 million (48.6%) were indebted (Government of India, 2005). The average outstanding debt was 12,585 rupees ($320) per farmer household and 25,902 rupees ($660) per indebted farmer household (Government of India, 2007).

Farmers' indebtedness varies by state, low in less developed states and high in agriculturally developed states (see table). In 2003, indebtedness was higher in states that had input-intensive and diversified agriculture, as in Andhra Pradesh (82%), Tamil Nadu (74.5%), Punjab (65.4%), Kerala (64.4%), Karnataka (61.6%), Maharashtra (54.8%) and Haryana (53.1%). In at least four states, a large proportion of the debt went to productive purposes. More than half the indebted farmers took loans for capital or current business expenditures, accounting for 58.4% of outstanding loans.

The sources of that debt make a big difference. At one end of the spectrum is Maharashtra, where institutional credit accounted for most of the indebtedness. But in Andhra Pradesh, local moneylenders dominate the scene. Across India, more than two-fifths of debt is owed to non-institutional agencies. Of that non-institutional debt, 37.5% carries an interest rate above 30%. Interest rates for home and car loans are lower than those for farm loans. And even banks and microfinance institutions charge 18-24% on farm loans (Indian Express, 2007). Formalization of debt will thus reduce the debt burden on farmers, but other measures are also essential.

Also evident is some relationship between farm debt and suicides. In all states that reported suicides among farmers, debt incidence and debt per farmer household were high. During 2001-2005, 86,922 farmers committed suicides – 54% from Andhra Pradesh, Karnataka, Kerala and Maharashtra. Driving the distress were declining profitability, growing production and marketing risks, an institutional vacuum and lack of alternative livelihood opportunities.

Table. Farmer indebtedness in major Indian states, 2003

State	*Estimated number of indebted farmer households*	*Share of farmer households indebted (per cent)*	*Average loan per household (rupees)*
Andhra Pradesh	49 493	82.0	23 965
Tamil Nadu	28 954	74.5	23 963
Punjab	12 069	65.4	41 576
Kerala	14 126	64.4	18 135
Karnataka	24 897	61.6	18 135
Maharashtra	36 098	54.8	16 973
Haryana	10 330	53.1	26 007
Rajasthan	27 828	52.4	18 372
Gujarat	19 644	51.9	15 526
Madhya Pradesh	32 110	50.8	14 218
West Bengal	34 696	50.1	10 931
Orissa	20 250	47.8	5 871
Uttar Pradesh	69 199	40.3	7 425
Himachal Pradesh	3 030	33.4	9 618
Bihar	23 383	33.0	4 476
Jammu and Kashmir	3 003	31.8	1 903
Assam	4 536	18.1	813
All India	434 242	48.6	12 585

Source: Based on data from National Sample Survey Organization, "Situation assessment survey of farmers, 2003", as reported in Government of India, *Report of the Expert Group on Agricultural Indebtedness* (New Delhi, Ministry of Finance, 2007).

agriculture, agricultural productivity growth accelerated in East Asia after 1980.

The potential gains from higher productivity in agriculture are large. Christiaensen and others (2006) suggest that a percentage point of additional growth in agricultural GDP per capita in South Asia would reduce the poverty headcount 3.85 times more than an additional percentage point growth outside agriculture. In the region as a whole, the figure is 2.63 times.

Low labour productivity in agriculture reflects slow progress in technological adaptation and innovation in farm practices due to low literacy among the rural poor; low mechanization rates; inability to produce on a mass scale because of restrictions on land ownership; and limited knowledge of the quality aspects of production, distribution and marketing.

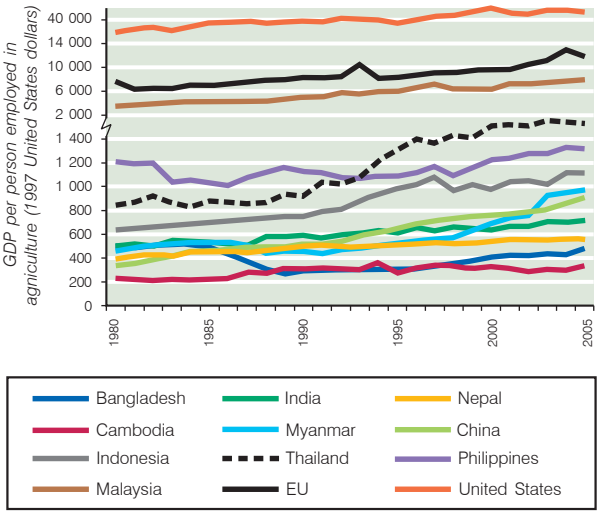
For example, access to high-yielding varieties of grain by the poor is limited in remote communities, and illiterate farmers do not have the knowledge to use them. Illiteracy among the rural poor, particularly women, is high in Asia, particularly in South Asia. Female illiteracy was 46% in India in 2001, and 72% among rural females (NLM, 2001). Illiteracy among rural females in Balochistan (Pakistan) was 98% (Rehman, 1998).

Slow progress in mechanization also contributes to low agricultural productivity. Agricultural tractor use in developing countries of the region in 2001 was 40% of that in the rest of the world (8.4 tractors per 1,000 hectares in Asia and the Pacific, against 20.7 in the rest of the world). Per capita agricultural land holding in developing countries in Asia and the Pacific was only 0.27 hectares, against 1.41 hectares in the rest of the world. A large portion of Asia's agricultural produce is lost during transportation to markets. For example, nearly 40% of India's agricultural produce is wasted because of a lack of post-harvest facilities for handling, storage and transportation (India Research, 2006).

Land productivity has improved but remains well below European levels

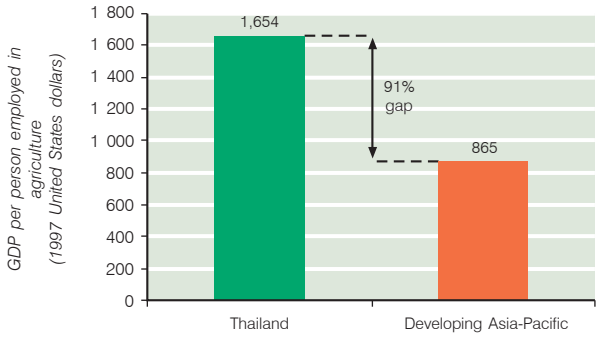
Asia has recorded the largest land productivity gains anywhere since 1961. Output per hectare increased by 284% during 1961-1994, faster than the United State's 186% and Europe's 169%. But its land productivity, although ahead of North America's by a large margin, was 24% lower than Europe's in 1994 (table 3.3). It

Figure 3.6. Labour productivity trends in agriculture, 1980-2005



Source: Based on data from ILO, *Key Indicators of the Labour Market 2007, 5th Edition* (Geneva, ILO, 2007).

Figure 3.7. Productivity gaps in agriculture, 2005



Source: Based on data from ILO, *Key Indicators of the Labour Market 2007, 5th Edition* (Geneva, ILO, 2007).

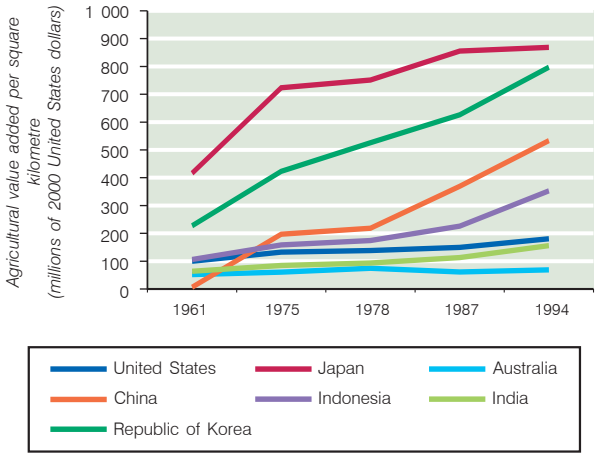
Table 3.3. Land productivity by continent

	Asia	Europe	North America
Output per hectare (United States dollars)			
1961	370.6	815.04	374.79
1994	1 051.18	1 374.48	697.37
Productivity growth (per cent)			
1961-1994[a]	8.5	0.8	5.6[b]
1994/96-1998/00	3.5	1.1	2.3
2000-2003	2.1	−0.8	−0.3
Annual productivity gap vs. Europe			
1994			
United States dollars per hectare	323.3	-	677.11
Per cent gap	23.5	-	49.3
2003			
United States dollars per hectare[c]	126.7	-	707.5
Per cent gap	9.9	-	102

Sources: Data for 1961-1994 from FAO, *AGROSTAT Database* (Rome, FAO, 2007); data for 1998-2000 from FAO, *Compendium of Agricultural-Environmental Indicators 1989-1991 to 2000* (Rome, FAO, 2003); data for 2000-2003 based on World Bank, *World Development Indicators 2006* (CD-ROM) (Washington, D.C., World Bank, 2006).

[a] Simple annual average growth.
[b] Includes Central America.
[c] Estimates.

Figure 3.8. Land productivity in selected countries, 1961-1994



Sources: Data based on D. Lee and L. Zepeda, "Agricultural investment and productivity in developing countries" (Rome, FAO, 1997) and FAO, *AGROSTAT Database* (Rome, FAO, 2007).

improved further since then, if at a declining pace. Even with the improvement, it is estimated to be 10% lower than Europe's.

Land productivity gains in Asia are spearheaded by China, with an 87-fold increase since 1961 (figure 3.8), but other developing countries are catching up. Land productivity in India and Indonesia lags far behind Japan, Republic of Korea and China. China's success is due partly to land reforms, mechanization and higher input use. Its fertilizer use is on a par with Japan and New Zealand. Fertilizer use in India, by contrast, is less than half that. While land irrigation had a greater impact on agricultural productivity in the 1960s through the 1980s, its impact has been declining due to the scarcity of water and the resulting slow growth in irrigated land, which now comes mostly from groundwater development, putting pressure on its sustainability.

Agriculture – a powerful driver of poverty reduction and social equity

Faster economic growth is only one part of reducing poverty. The regions and sectors of growth also matter. Poverty in India responds far more to rural economic growth than to urban (Ravallion and Datt, 1996). Differences in initial conditions related to rural development and human resource development also lead to different outcomes (Ravallion and Datt, 1999). And agricultural productivity and public expenditure on rural development are important determinants of poverty (Ravallion and Datt, 2002).

Raising agricultural productivity can take 218 million people out of poverty

Agricultural labour productivity also has a significant impact on poverty reduction. ESCAP estimates show that a 1% increase in agricultural productivity would lead to a 0.37% drop in poverty in the Asia-Pacific region (table 3.4).[2] Given the large agricultural labour productivity gaps among countries in the region, the potential gains appear substantial. Raising the region's average agricultural productivity to Thailand's, the benchmark for this chapter, can take 218 million people out of poverty.[3,4] India has the most to gain from a productivity drive, with nearly two-thirds of the region's poor and a large agricultural productivity gap.

Investment, literacy and agricultural productivity reduce income inequality. Increases in agricultural value added are more effective in reducing income inequality because of their disproportionate effect on the lowest income groups (World Bank, 2007). ESCAP estimates that raising agricultural productivity to the level of Thailand could reduce inequality, measured by the Gini coefficient, by 6%.

> *"Agricultural development promotes equality"*

Agricultural R&D, education of the rural population and rural infrastructure, particularly electricity and roads, are key determinants of labour productivity and have a major impact on poverty reduction (Fan and others, 2003). Additionally, there is strong evidence of the greater impact of human capital development on agricultural total factor productivity (Majid, 2004; Rao, Coelli and Alauddin, 2004). ESCAP estimates a significant positive impact on agricultural productivity from life expectancy (elasticity of 0.20), literacy (0.70) and economic openness (0.40). These estimates indicate that both economic and social conditions – particularly health and education – affect agricultural productivity.

Table 3.4. Impacts of labour productivity in agriculture on poverty reduction in the Asia-Pacific region

Results		Reduction in the number of poor (millions)
Agricultural labour productivity (long run) elasticity of $1 a day poverty line: –0.37	Due to 1% increase in agricultural labour productivity	2.37
	By raising the agricultural labour productivity to the benchmark level	218.3

Source: ESCAP estimates.

Note: Pooled least squares estimation for 46 developing countries for 1975-2000.

[2] This is consistent with estimates by others. Fan and others (2003) estimated the agricultural labour productivity elasticity of poverty to be at –0.417 for Thailand. Rao and others (2004), using Sala-i-Martin data, found an elasticity of –0.87.

[3] Thailand was taken as the benchmark for several reasons. First, it is one of the few countries in the region that has achieved most of the Millennium Development Goals. Second, agriculture has contributed much towards these targets. Third, the productivity levels in better performers (such as Malaysia, Singapore and the Republic of Korea) are either relatively high or not representative.

[4] The impact of agricultural productivity growth could be highest on the poorest. For example, Ligon and Sadoulet (2007) found that a 1% increase in GDP originating in agriculture increased the expenditures of the poorest half of the population on average by 3.7%, far more than growth originating in the rest of the economy.

Liberalizing trade in agricultural products and its impact on developing economies have long been contentious in international trade negotiations, including the Doha development round. Developing countries have so far been cautious in multilateral agricultural trade reforms – because of possible harm through preference erosion, rising agricultural prices for small food-importing economies and adverse effects on food security and poverty.

A study by ESCAP on the impact of agricultural trade liberalization shows poverty reductions in some countries but increases in others (table 3.5). The region could take 5 million people living on less than $1 a day out of poverty through Doha agricultural trade reforms in the short run, possibly increasing to 7 million in the long run. China appears to gain the most, reducing the number of poor people by 10 million, mainly in rural areas, due to an increase in unskilled workers' real wages. Thailand and Viet Nam would also reduce the prevalence of poverty, as would Indonesia and the Philippines.[5] Poverty would increase, however, in Bangladesh, India, the Russian Federation and Sri Lanka in both the short and long runs. India would suffer the most, with 7.2 million new poor due to the negative impact on the real wages of unskilled labourers.[6]

Comprehensive reforms going beyond Doha could take 48-51 million people out of poverty

If the world goes beyond the Doha reforms and undertakes comprehensive agricultural liberalization – eliminating all tariffs, export subsidies and domestic support for agricultural and food products – the Asia-Pacific region could take 48 million people out of poverty in the short run, increasing to 51 million in

Table 3.5. Impact of Doha and comprehensive reforms on poverty

(Based on $1 a day poverty line)

	Under Doha reforms		*Under comprehensive reforms*	
	Short run headcount (Δ millions)	*Long run headcount (Δ millions)*	*Short run headcount (Δ millions)*	*Long run headcount (Δ millions)*
Bangladesh	0.4	0.3	−2.5	−2.4
China (rural)	−10.3	−11.5	−24.7	−27.3
China (urban)	−0.1	−0.1	−0.2	−0.3
India (rural)	5.9	5.9	−10.2	−10.0
India (urban)	1.3	1.3	−2.2	−2.1
Indonesia	−0.9	−1.2	−3.2	−3.8
Malaysia	0.0	0.0	0.0	0.0
Mexico	−0.1	−0.1	−0.4	−0.3
Philippines	−0.6	−0.8	−2.1	−2.4
Russian Federation	0.0	0.0	−0.5	−0.5
Sri Lanka	0.0	0.0	0.1	0.1
Thailand	−0.4	−0.5	−0.6	−0.6
Viet Nam	−0.2	−0.2	−1.4	−1.4

Source: ESCAP estimates.

[5] Estimates by Cororaton and others (2006) indicate that Doha reforms could lead to a slight increase in poverty in the Philippines due to a deterioration in the terms of trade that could result in a larger increase in the prices of consumption goods than in household nominal incomes.

[6] Annabi and others (2006) find similar results for Bangladesh.

the long run. All countries except Sri Lanka would see a reduction. Rural China would see nearly 25 million people come out of poverty, and India 12 million.

Many other studies find a positive impact from agricultural trade reform on developing economies (see, for example, Anderson and Martin, 2005). The results also suggest that the largest increases in welfare would accrue to rural households. The size of the effect varies. In China, the urban-rural income ratio declines under global trade liberalization scenarios, but not significantly (Hertel and Zhai, 2006). In Indonesia too, the impact on inequality would be negligible, but rising incomes would boost a small number of people out of poverty (Robilliard and Robinson, 2006).

> *"The largest increases in welfare due to trade reforms would accrue to rural households"*

ESCAP estimates of the aggregate welfare effects under Doha show modest annual gains of $4.6 billion globally in the short run, increasing to $5.2 billion in the long (table 3.6). Two-thirds of the total gains would accrue to Asia, with Japan gaining the most. Developing countries in Asia would gain a modest $365 million (8% of the total) in the short run, rising to $640 million (12%) in the long run. The Republic of Korea, Thailand and India appear to gain the most from agricultural trade liberalization under Doha, due mainly to gains in the terms of trade. China, which stands to gain the most in poverty reduction under Doha, appears to lose in overall absolute welfare gains. Many others will also lose, though marginally, mainly due to a terms-of-trade shift. The small aggregate gains reflect the relatively small degree of reform anticipated if the proposal on agriculture remains in its current form.

Similar results are found in Annabi and others (2006). According to that study, Doha reforms could result in aggregate welfare losses for Bangladesh due to an adverse terms-of-trade effect. In India, the welfare of the poorest households could fall while the richest could gain.

Developing Asia-Pacific region to gain $3.3-3.5 billion under comprehensive agricultural trade reforms

Under comprehensive agricultural trade reforms, both regional and global welfare gains increase several times. Global welfare gains exceed $23 billion in the short run, increasing to $37 billion in the long run. Developed economies in Asia and the Pacific as a group – Japan, Australia and New Zealand – gain the most under Doha and comprehensive reforms. Developing country gains in the region also increase nearly 10 times to $3.3 billion in the short run, rising to $3.5 billion in the long run. Many countries that could suffer welfare losses under Doha reforms turn out to be net gainers under the comprehensive reforms, with China, Bangladesh and the Philippines the exceptions.

The Republic of Korea, Malaysia, Thailand and India would gain the most in absolute terms. Malaysia and Sri Lanka would turn losses under Doha into gains under the comprehensive reforms, of 1.5% and 0.7% of GDP, respectively.

Table 3.6. Estimated aggregate welfare effect of agricultural reforms

	Under Doha reforms				*Under comprehensive reforms*			
	Short run		*Long run*		*Short run*		*Long run*	
	Welfare effect (millions of United States dollars)	*GDP share (per cent)*	*Welfare effect (millions of United States dollars)*	*GDP share (per cent)*	*Welfare effect (millions of United States dollars)*	*GDP share (per cent)*	*Welfare effect (millions of United States dollars)*	*GDP share (per cent)*
Developing Asia-Pacific economies								
Bangladesh	−39.9	−0.09	−27.7	−0.06	−46.1	−0.10	−19.0	−0.04
China	−477.4	−0.04	−441.0	−0.04	−976.5	−0.08	−918.6	−0.08
Hong Kong, China	−15.8	−0.01	−3.7	0.00	1 64.2	0.10	201.3	0.12
India	66.2	0.01	94.6	0.02	351.3	0.07	844.2	0.18
Indonesia	−64.3	−0.04	−53.8	−0.04	101.8	0.07	−25.8	−0.02
Malaysia	−30.0	−0.03	−22.6	−0.03	1 346.4	1.53	830.6	0.94
Philippines	−31.5	−0.04	−38.4	−0.05	−27.9	−0.04	−73.1	−0.10
Republic of Korea	818.3	0.19	955.0	0.22	1 741.1	0.41	2 113.1	0.49
Singapore	−15.7	−0.02	22.5	0.03	6.1	0.01	16.6	0.02
Sri Lanka	−0.4	0.00	3.9	0.02	105.5	0.66	116.0	0.73
Thailand	130.7	0.11	156.0	0.14	508.4	0.44	415.9	0.36
Viet Nam	−6.3	−0.02	−13.3	−0.04	46.9	0.14	43.5	0.13
Developed Asia-Pacific economies								
Australia	856.9	0.24	755.2	0.21	1 242.5	0.35	2 145.6	0.60
New Zealand	390.4	0.77	324.6	0.64	529.8	1.05	506.1	1.00
Japan	1 514.7	0.04	2 117.2	0.05	8 067.9	0.19	17 614.1	0.42
Other								
Canada	90.0	0.01	70.8	0.01	314.0	0.04	442.3	0.06
Mexico	−188.7	−0.03	−143.9	−0.02	−177.6	−0.03	−125.6	−0.02
Russian Federation	−344.4	−0.11	−273.5	−0.09	3.2	0.00	108.7	0.04
United States	1 213.9	0.01	1 483.2	0.01	2 179.0	0.02	2 691.6	0.03
European Union	1 716.2	0.02	1 196.6	0.01	5 405.9	0.07	7 587.6	0.09
South and Central America	607.4	0.04	465.6	0.03	578.4	0.04	263.2	0.02
Rest of the world	−1 617.5	−0.07	−1 415.7	−0.06	1 886.6	0.08	2 340.0	0.09

Source: ESCAP estimates.

Note: Welfare effect is based on equivalent variation. Changes in GDP share are as a percentage of base GDP.

What is holding back agriculture?

Structural constraints, anti-agriculture policy bias and external factors are behind the slow growth in agricultural productivity.

- Structural constraints include inequality in land ownership, lack of human capital development due to limited access to health and education, and inadequate rural infrastructure.
- Policy constraints include anti-agricultural macroeconomic policies, failure in agricultural credit policies and lack of promotion of R&D and extension services.
- External factors include limited progress in liberalizing agricultural trade, agricultural price instability and declining official development assistance (ODA).

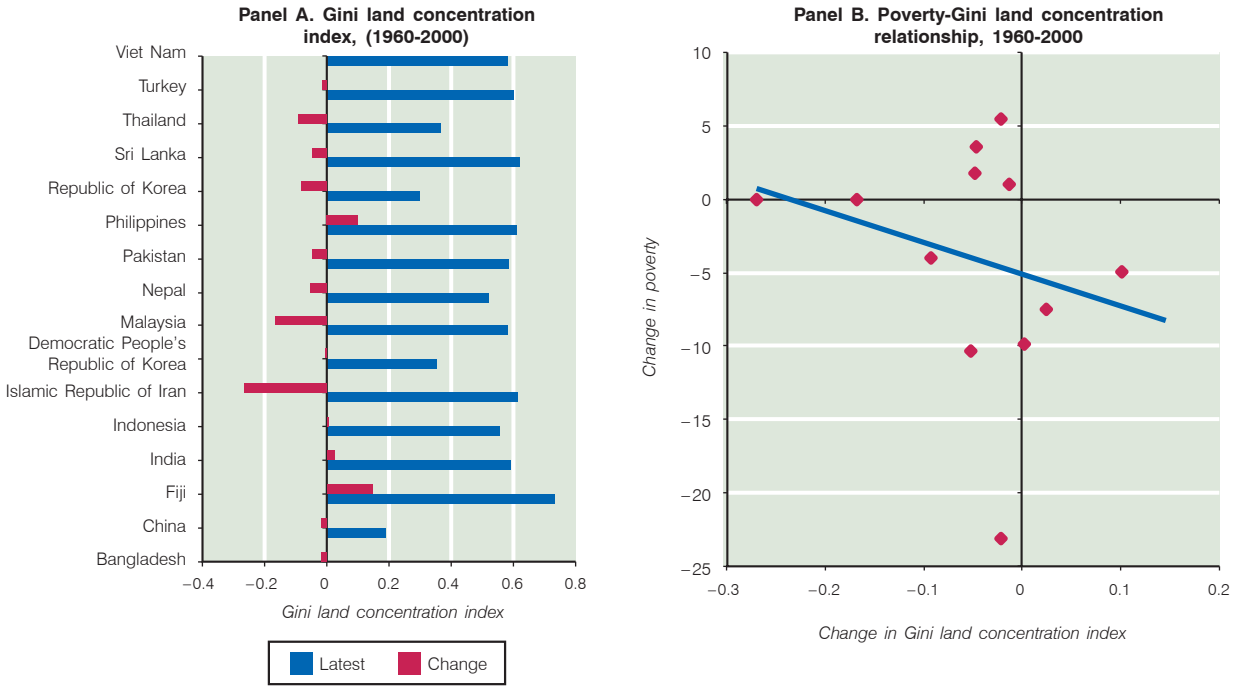
Inequality in land ownership weighs on productivity

Inequality in asset ownership, particularly land, remains high in the region, holding down agricultural productivity. The land Gini coefficient remains high in many developing countries in the region (figure 3.9, panel a). The distribution of land is often skewed towards the rich and the middle class, with the poorest left out. In China, however, the household responsibility system, introduced in the 1980s, has had a significant impact on agricultural growth and poverty reduction (figure 3.9, panel b; Lin, 1992).

> *"Agriculture is not being widely used as an effective channel for redistributing income"*

Redistribution policies will not reduce poverty without economic growth, but, combined with growth, they can reduce poverty more than growth that leaves the distribution unchanged. Progress in distributional change will – in addition to the one-shot effect on

Figure 3.9. Land Gini coefficient and its relationship with poverty, 1960-2000



Sources: Calculations based on data from IFAD, *The Rural Poverty Report 2001* (Rome, IFAD, 2001); and World Bank, *Millennium Development Goals Database* (Washington, D.C., World Bank, 2007).

Note: The Gini land concentration index measures the inequality of land holding, with numbers closest to 1 indicating greater inequality.

poverty from pure redistribution – have a long-run effect by increasing the sensitivity of poverty to growth (World Bank, 2005). But despite agriculture's potential, many Asia-Pacific countries are not using it as a channel for redistributing income.

Wide inequality in access to health and education has made agriculture less productive

Inequalities in access to health and education are common. The urban-rural gap in access to safe drinking water is 19% in the Asia-Pacific region. Nearly a quarter of the rural population does not have access to safe drinking water, against 7% in urban areas. The gap in access to improved sanitation is worse, at 52% (figure 3.10). Fewer than a third of people in rural areas have access to improved sanitation, compared with 70% in urban areas.

> *Lack of rural infrastructure is a major bottleneck for growth in agriculture and for poverty reduction*

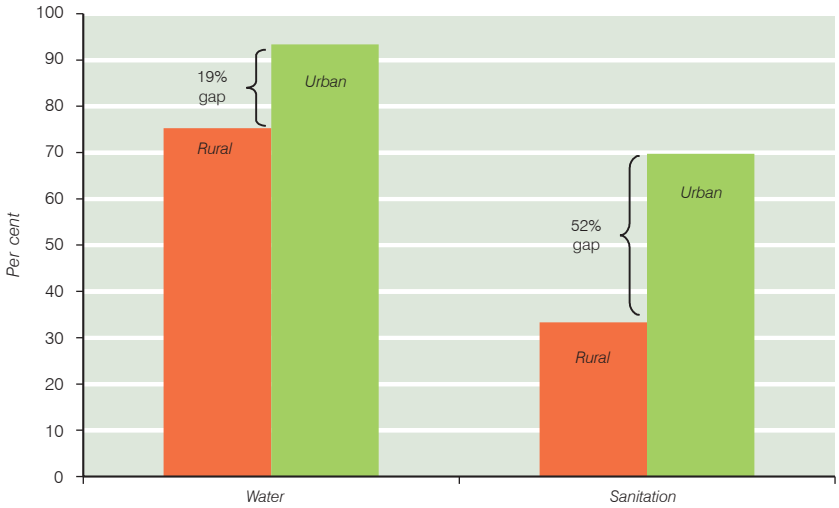
The inequality in access to water and sanitation is reflected in health indicators as well. Infant mortality was 12% higher in rural areas in China in 1995 (Zhang and Kanbur, 2003), and in India 68% higher (Ravi, 2003), mainly the result of disparities in basic services (box 3.2). In China, the number of hospital beds per 1,000 people was more than five times higher in urban areas than in rural areas; in India, it was 15 times higher. Equally large are the disparities in health-care personnel and births attended by a skilled health professional. A similar disparity is seen in education. In China, 116 million adults, mainly in rural areas, were illiterate in 2005 (Washington Post, 2007). In India, rural female literacy rate was 47% in 2001 (India, 2001).

Inequality in access to health, education and other services makes poverty reduction difficult and retards growth. By increasing strength, endurance and cognitive power, better health would mean higher worker productivity. And better education boosts productivity by increasing workers' ability to adopt and adapt to new technologies.

Lack of rural infrastructure hinders growth

A lack of rural roads, electricity and telecommunication constrains rural farmers. In South Asia, 35% of the rural population lives more than two kilometres from an all-weather road (ESCAP, 2006b). More than a billion people in Asia and the Pacific did not have access to electricity, the majority of them rural poor. In South Asia alone, 57% of the population did not have electricity, and in Nepal 85%. Better access to electricity can clearly reduce poverty (box 3.3; Fan, Jitsuchon

Figure 3.10. Weighted average rural-urban gap in access to water and sanitation in Asia and the Pacific, 1996-2004



Source: Based on data from United Nations, *A Future Within Reach: Reshaping Institutions in a Region of Disparities to Meet the Millennium Development Goals in Asia and the Pacific* (United Nations publication, Sales No. E.05.II.F.27, 2005).

Box 3.2. The nexus between poverty and health in rural areas

Poverty is often compounded by a lack of access to quality health care. And that, in turn, is partly the result of relatively low investment in health. India has three times more physicians in urban and high-income areas than in rural areas. The situation is similar in many other Asian developing countries and in the Pacific (Durairaj, 2007).

Reinforcing the vicious cycle of poverty and ill health in rural areas are low levels of education (especially for women and girls), widespread landlessness and unemployment, poorly developed financial institutions, and limited negotiating experience and collective organizations. People in rural areas lack basic services, such as safe water, sanitation and electricity. Environmental issues are also important, with rural areas prone to flooding, drought and desertification. Added to these are diseases such as malaria, which remain entrenched in rural areas of the Pacific, South Asia and South-East Asia.

In the larger countries of Asia-Pacific, 80-90% of poor people live in rural areas. Bangladesh, China, India, Indonesia and Pakistan alone have more than two-thirds of the world's people living in rural areas without access to sanitation (ESCAP, 2007). For most such people, out-of-pocket expenditures are the main way to finance heath care. Such expenditures can become catastrophic. In some instances, household spending on health is more than 40% of income after subsistence needs are paid for. Out-of-pocket payments increased the rate of poverty by 33% in Viet Nam, 19% in China, 17% in Bangladesh and 12% in India (Durairaj, 2007).

The lesson is the need for greater investment, both in the health sector and in other sectors related to rural health and poverty. Improvements in health and economic growth are mutually reinforcing, especially if policies are pro-poor. One example is suitable and effective health insurance systems that pool risks and subsidize health care for those least able to pay. And addressing the social determinants of health, which include gender equity and education, can have far-reaching benefits for the rural poor.

Box 3.3. Rural infrastructure making a dent in poverty in Thailand

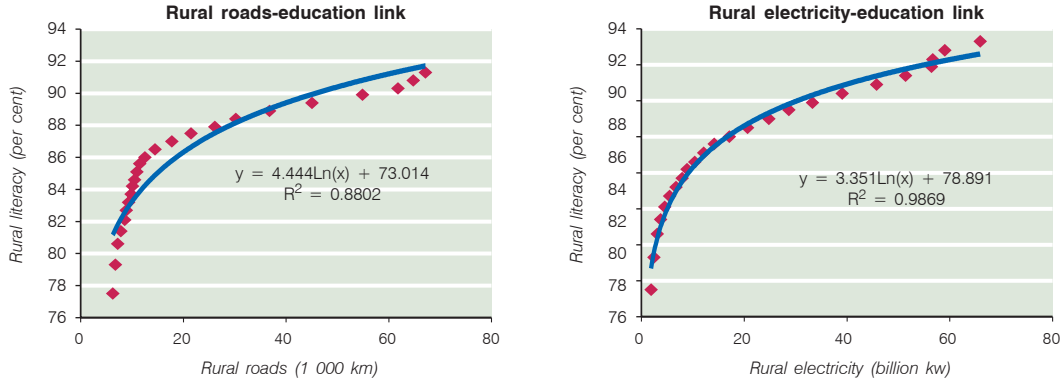
In the last quarter century, rural infrastructure in Thailand has improved immensely, connecting the rural economy to markets. Rural road lengths increased on average by 11% per year, increasing the rural road density from 12 kilometres per 1,000 square kilometres of geographical area to 124 kilometres. Rural telephone lines have increased by 23% per year, raising the number of telephone lines per 1,000 rural residents to 37 in 2000 from 0.5 in 1977. Finally, a 17% annual increase in rural electricity access raised the share of the rural population with access to electricity from 7% in the early 1970s to 97% in 2000. The result has been a tremendous increase in agriculture's productivity.

Improvements in rural roads and electricity have had a positive effect on human capital by providing opportunities for education (figure a). The impact of such improvements on the poorest is very high. Rural infrastructure has enabled the rural poor, mostly in agriculture, to generate more income and reduce poverty. Human capital development had an even larger impact on poverty reduction (figure b).

(Continued on next page)

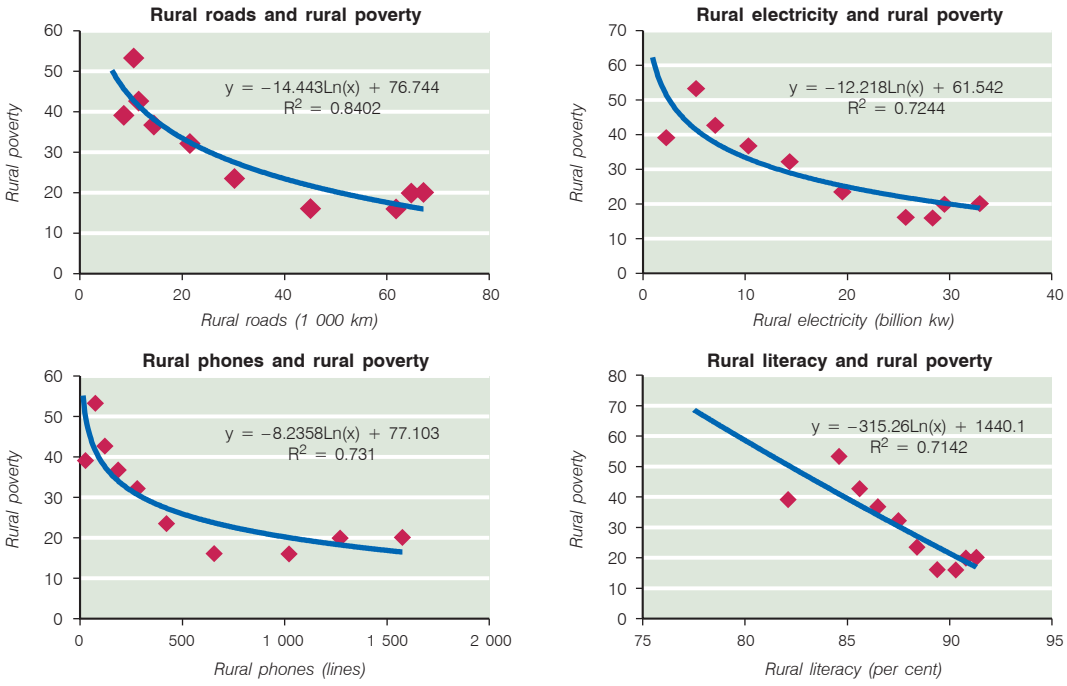
Box 3.3 *(continued)*

Figure a. Positive effect of rural roads and electrification on education, 1975-2000



Source: Data based on S. Fan, S. Jitsuchon and N. Methakunnavut, "Impacts of public investments on poverty reduction in Thailand", International Food Policy Research Institute (Washington, D.C., IFPRI, 2003).

Figure b. Rural infrastructure helped reduce poverty over 1975-2000



Source: Data based on S. Fan, S. Jitsuchon and N. Methakunnavut, "Impacts of public investments on poverty reduction in Thailand", International Food Policy Research Institute (Washington, D.C., IFPRI, 2003).

Note: Rural poverty refers to percentage of rural population living below the poverty line.

and Methakunnavut, 2003). Poor telecommunications also deprive farmers of vital information on agricultural product prices. In India, only 4 of 100 farmers had a fixed telephone line in 2004, and another 4 a mobile phone.

Macroeconomic policy has been anti-agriculture

Macroeconomic policies have both direct and indirect effects on the agricultural poor. Inflation – a regressive and arbitrary tax on incomes and assets – has a disproportionate impact on the purchasing power of the poor. High interest rates reduce the borrowing capacity of small-scale farmers, curtailing investment and farm cultivation. High inflation and interest rates also discourage private investment, reducing growth, the single most important factor influencing poverty (IMF and World Bank, 2001). A low-yielding agricultural sector could bear the brunt of inflation-induced investment cuts. Maintaining macroeconomic stability is therefore a key policy in agricultural growth and poverty reduction.[7]

Inflation in the developing countries of Asia and the Pacific rose from a low of 3% a year in the 1960s to more than 10% in the 1970s and 12% in the 1980s and 1990s. Rates have since come down to about 6%, but they remain high in Pakistan, Sri Lanka, the Lao People's Democratic Republic, Samoa and Tonga.

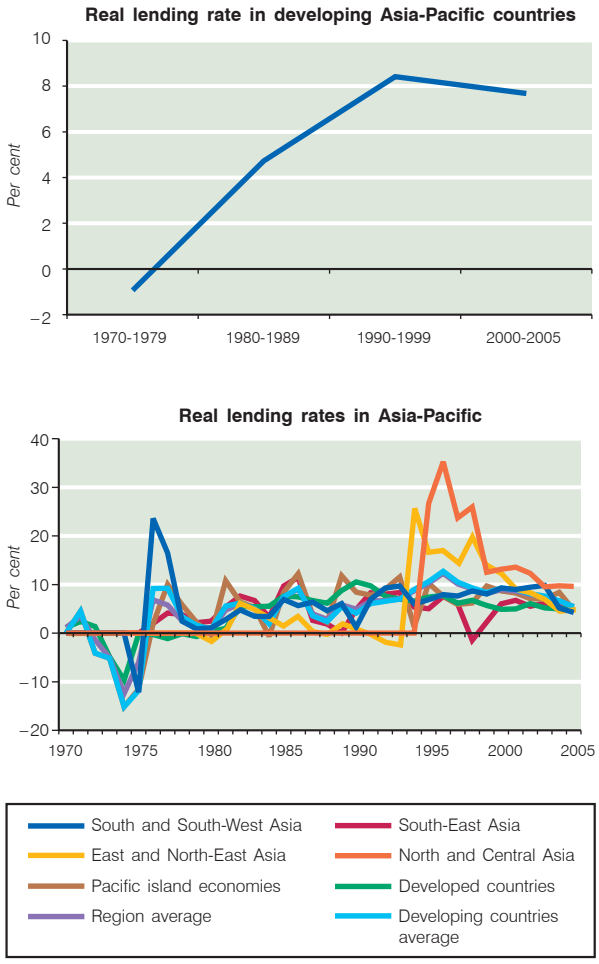
> *"Taxing agriculture pushes people into poverty"*

Higher inflation tends to produce more poverty – and lower inflation, less. Research has found that macroeconomic stability has a positive impact on poverty reduction, notably by avoiding inflationary shocks (Chen and Ravallion, 2007). The inflation-poverty nexus signals the macroeconomic policy implications, particularly in South Asia and Central Asia, which have higher inflation than East, North-East and South-East Asia.

The real lending rate climbed to a historical high exceeding 8% in the mid-1990s and remains high even now (figure 3.11). North and Central Asia, the Pacific islands and South Asia have had higher real interest rates than East, North-East and South-East Asia. Interest spreads are on the rise, indicating the pressure of inflation (figure 3.12).

Direct and indirect taxation of agriculture was common in many countries from the 1960s to the 1980s, reaching 40% in some countries and slowing both agricultural growth and overall growth. In Asia, as in other regions, indirect taxation on agriculture is more than twice direct taxation, such as through price intervention

Figure 3.11. High real lending rates, 1970-2004



Source: Based on data from World Bank, *World Development Indicators 2007* (CD-ROM) (Washington, D.C., World Bank, 2007).

[7] Other elements of macroeconomic stability, such as exchange rates and debt, also affect the poor.

(table 3.7). Agricultural taxation comes mainly through exchange rate policies and industrial protection, but because the poor depend heavily on agriculture, they lose most.

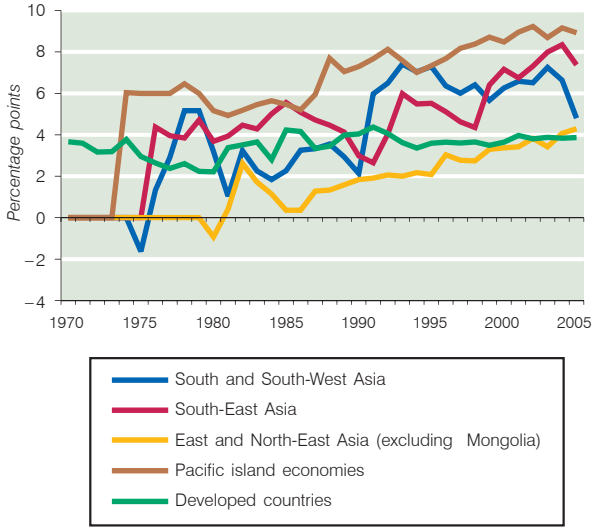
Credit markets discriminate against rural farmers

Access to finance by rural farmers has also been curtailed, particularly since the structural adjustment programmes of the 1980s and the phasing out of subsidized credit schemes. With the changes in monetary policy, the agricultural refinance schemes operated by central banks have ceased. Price stability has become the main objective. Many central banks now set rediscount rates and avoid directly supporting specific sectors.

Commercial bank lending for agriculture is naturally limited due to the low returns and lack of collateral. Many countries – such as Indonesia, Malaysia, Thailand and Viet Nam – tend to use voluntary savings for financing agriculture. Thailand and Viet Nam have issued bonds for agricultural finance, while Pakistan has used equity issues in recent years, but the amounts remain small (FAO, 1999).

Although the region is resource-rich, the financial resources available for agriculture could be curtailed if global recessionary fears materialize. If the subprime crisis spills over to Asia-Pacific, it could compel financial institutions to be cautious in lending to risky areas such as agriculture, unless governments step in to guarantee such loans or make special arrangements to mitigate the adverse effects.

Figure 3.12. Interest rate spreads on the rise, 1970-2004



Source: Based on data from World Bank, *World Development Indicators 2007* (CD-ROM) (Washington, D.C., World Bank, 2007).

Note: Interest rate spread refers to lending rate minus deposit rate.

Limited spending on agricultural R&D and extension constrains productivity growth

Agricultural R&D is one of the main sources of productivity growth, amply evident in the green revolution. While expenditure on R&D in the Asia-Pacific region has gradually increased, in some countries it either declined or remained stagnant. In China, it fell from 0.57% of agricultural value added in the early 1960s to 0.4% in 2000. In Thailand, it has remained more or less stagnant, at 0.4-0.5% since the 1970s, with a small recent improvement. India recently increased its R&D expenditure from 0.18% of agricultural value added to 0.34% (figure 3.13).

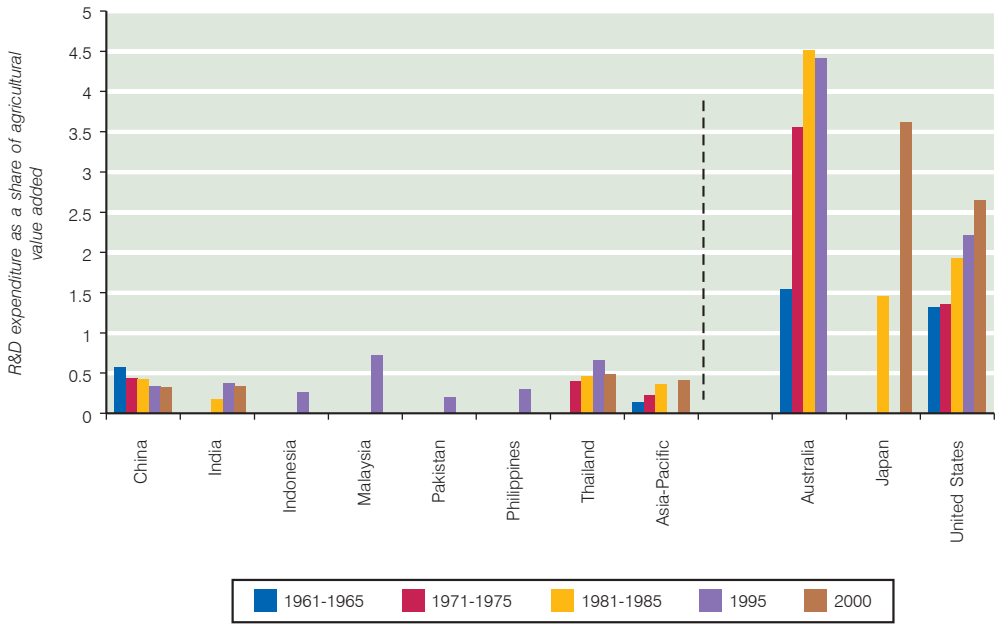
Table 3.7. Taxation of agriculture in Asia

(Period averages, per cent)

	Period	Indirect tax	Direct tax	Total tax
Malaysia	1960-1983	8.2	9.4	17.6
Pakistan	1960-1986	33.1	6.4	39.5
Philippines	1960-1986	23.3	4.1	27.4
Republic of Korea	1960-1983	25.8	−39.0	−13.2
Sri Lanka	1960-1985	31.1	9.0	40.1
Thailand	1962-1984	15.0	25.1	40.1

Source: M. Schiff and A. Valdes, "Agriculture and the macroeconomy", World Bank Policy Research Working Paper No. 1967 (Washington, D.C., World Bank, 1998).

Figure 3.13. R&D intensities for selected Asia-Pacific countries and developed countries, 1960-2000



Source: Based on data from World Bank, *World Development Report 2008* (Washington, D.C., World Bank, 2007).

Despite a gradual increase in R&D spending for agriculture in the region, it remains much lower than in developed countries, a possible constraint on productivity growth. Why the slow growth? First, private participation in R&D in the region is limited. In 2000, the share of private agricultural R&D was 8.1% of total R&D expenditure. Although this is somewhat higher than the developing-country average of 6.3%, it is far below the 54% of developed countries. Among the reasons for the lethargic participation of the private sector are issues related to patents, plant breeder rights and other forms of intellectual property.

Private participation in agricultural R&D is limited

Second, the drop in donor support for agricultural R&D since the mid-1990s curtailed R&D. For example, USAID support for the region closed in 1996, when it shifted funds to global research. World Bank funding of agricultural R&D also declined.[8] Third, public financing of agricultural R&D is constrained by fiscal pressure and low motivation for innovation. As the contribution of agriculture to growth has dwindled, public policy priorities have shifted from agriculture to industry and services.

Slow progress in agricultural trade liberalization hits the poorest hard

The impact of agricultural trade liberalization on poverty is unclear, particularly for the poorest, who produce mostly non-tradable goods. Trade liberalization affects multiple actors, markets and institutions in the economy, some positively, others negatively (Winters, 2002). The impact can also vary depending on infra-

8 World Bank lending in 1998 was an exception, with large research components under which China ($68 million) and India ($136 million) were able to borrow for agricultural R&D.

structure, type of commodity and social structures (such as inequality of land ownership).

International trade can have a positive impact on the poor through changes in relative prices and the availability of goods. Net exporters of food and agricultural products (Indonesia, Malaysia, Thailand and Viet Nam) could benefit from higher agricultural prices, the impact becoming larger when the poor are net producers. In Viet Nam, the poorest quarter of the people are net producers of rice, and export liberalization is estimated to have reduced the number of poor people by 5% (FAO, 2006b). Liberalization could also benefit the poor by making food available at low prices. But it could harm the poor in net importers, such as Bangladesh and the Philippines.

> *"The full benefits of globalization and international trade are not reaching the poor"*

Another channel for trade liberalization to affect agriculture and poverty is the greater availability of farm inputs and the resulting increase in agricultural productivity. In Bangladesh, liberalizing trade in irrigation equipment and fertilizer markets in the early 1990s produced structural changes in agriculture and a significant increase in rice productivity. The resulting increase in output reduced rice prices by 25%, benefiting the poor, who are the main consumers of rice (Klytchnikova and Diop, 2006).

For trade to have a greater impact on growth requires not just a supportive macroeconomic policy environment but effective institutions and good governance. In most developing countries in the region, however, institutions and governance structures are weak, and liberalization is incomplete. Facing stiff resistance from both developed and developing countries, agricultural trade liberalization has been limited. So, the full benefits of globalization and international trade are not reaching the poor.

Declining international prices discourage producers of staple crops

The share of staple foods in the food basket of the population is falling with rising incomes, but the decline in international prices to historical lows brings mixed blessings. The low prices benefit the landless poor the most by increasing their purchasing power, with the trend in poverty quite close to that of grain prices (figure 3.14). But low and unstable prices could cut competitiveness and discourage producers. People with the means (both poor and non-poor) could diversify production into more lucrative higher value crops. But poor farmers' income dropped, reducing their purchasing power, so those just above the poverty line could have fallen into poverty.

Average growth in production of the main staple crops in the Asia-Pacific region – rice, wheat and cereals – has been low in the last decade, at around 1% annually (figure 3.15). In per capita terms, average growth in production of these staples remained low: 2% for rice, 1% for wheat and cereals. Yields increased by 2-3% (figure 3.16). Production declined gradually from a peak in the late 1990s before recovering in 2003. In China, production of rice, wheat and cereals dropped by 12%, 20% and 12%, respectively, during 1999-2003. A similar trend was seen in India, with drops in rice and cereal production of 19% and 12%, respectively, during the same period.

However, production of rice, wheat and cereals has increased by 12-13% since 2002-2003 due to recoveries in China and India and production increases in Bangladesh, Indonesia, Myanmar, Thailand and Viet Nam. Rice production increased by 10% during the past decade. While wheat production declined marginally, cereal production increased by 11% over the period, and maize production, by 41%.

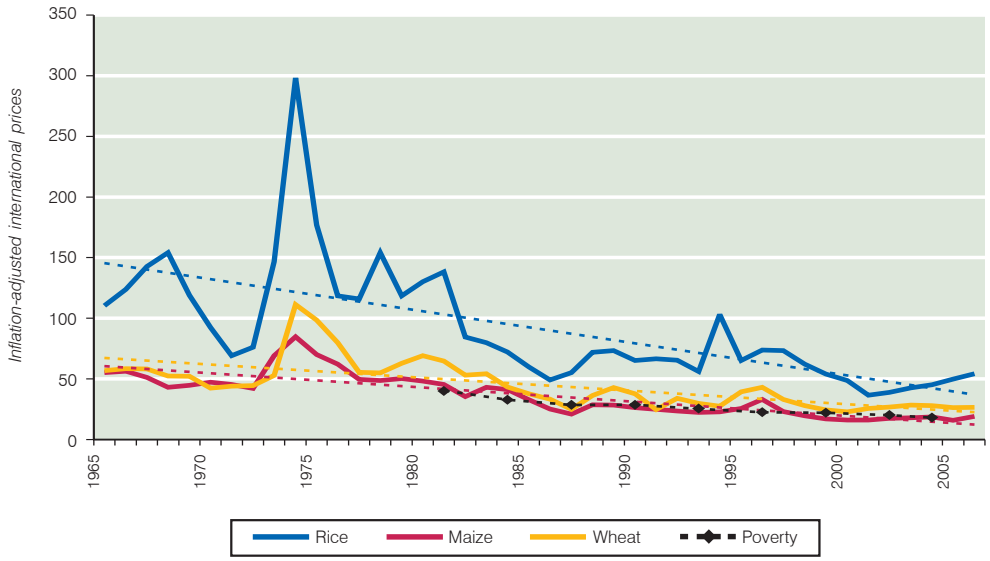
> *"The increases in staple prices create an opportunity to correct agricultural policies"*

Recent increases in the production of staple crops could reflect higher demand generated by their increased use in biofuels. The price increases could bring opportunities for the rural poor to raise their incomes – and enable governments to remove distortionary agricultural subsidies as the sector becomes commercially viable.

Progress in crop diversification is slow and limited

The driving force behind the revival of agriculture in some Asia-Pacific countries, particularly China and

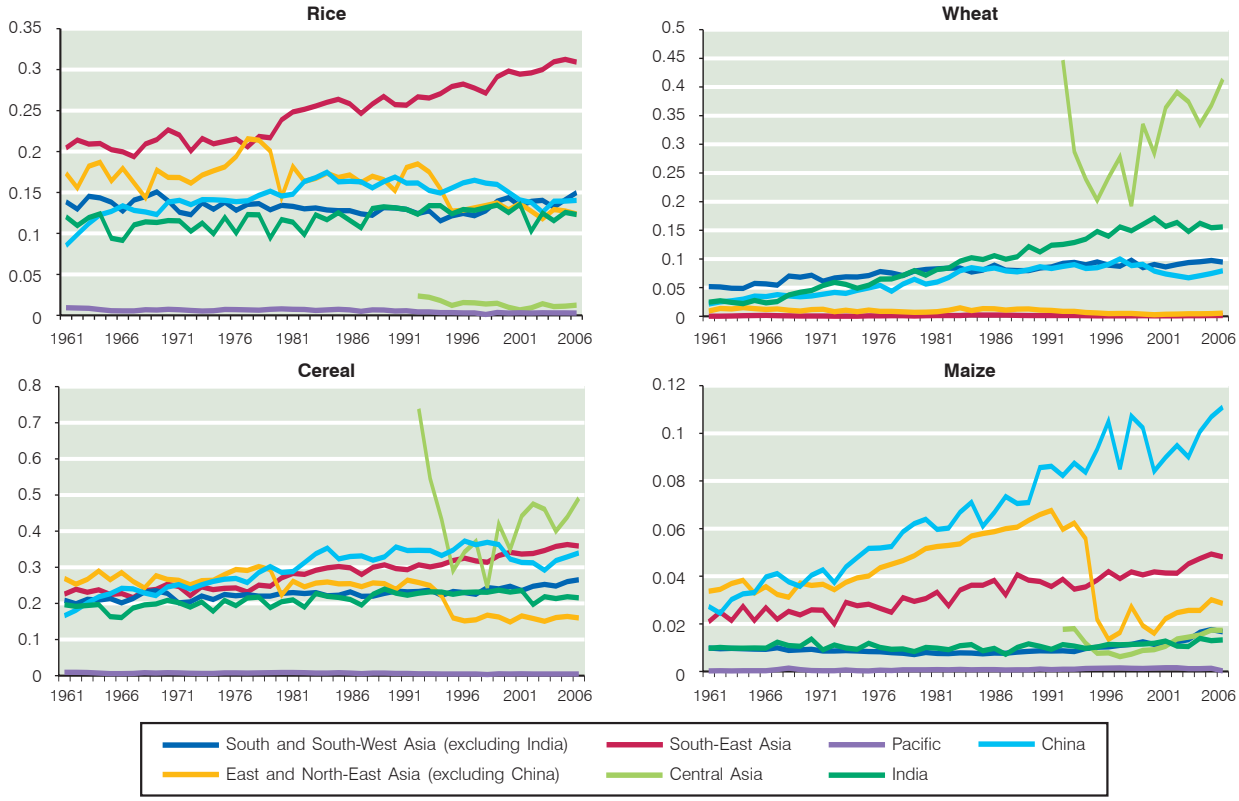
Figure 3.14. Trends in poverty and prices for major staple foods, 1965-2006



Sources: IMF, *International Financial Statistics* (CD-ROM) (Washington, D.C., IMF, 2007); and World Bank, *Millennium Development Goals Database* (Washington, D.C., World Bank, 2007).

Figure 3.15. Per capita production in key staple crops, 1961-2005

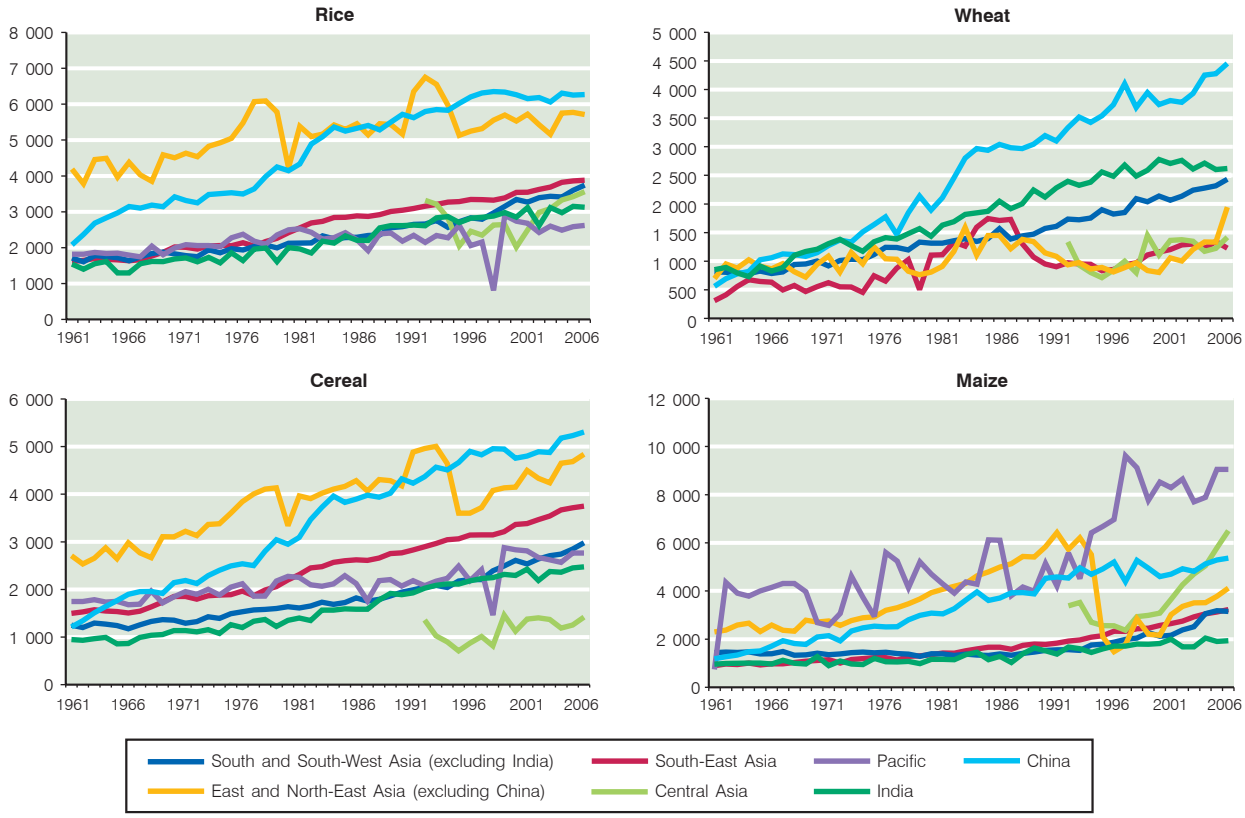
(Metric tonnes per capita)



Source: Based on data from FAO, *State of Food and Agriculture 2003-04 Database* (Rome, FAO, 2004).

Figure 3.16. Rice, wheat, cereal and maize yields, 1961-2005

(Kilograms per hectare)



Source: Based on data from FAO, *State of Food and Agriculture 2003-04 Database* (Rome, FAO, 2004).

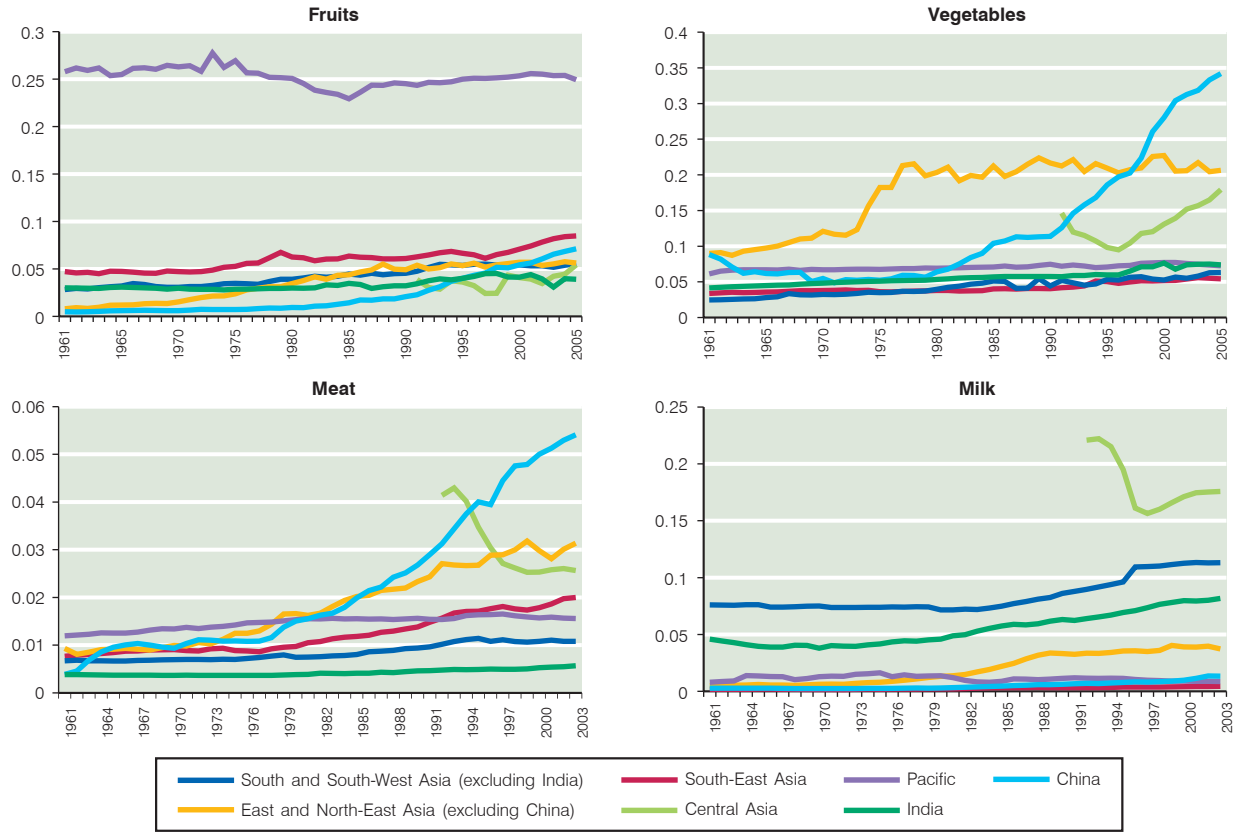
India, is the emergence of crops and livestock that are more profitable than traditional staples. Globalization and changing dietary patterns across regions have made diversifying into high value crops and livestock feasible and financially rewarding. The changing structure of production in major agricultural products indicates consumer appeal and producer response.

For example, fruit production in developing Asia-Pacific countries grew by 5.3% per year since 1990, more than doubling total production, much higher than 2.3% in the rest of the world (figure 3.17). China registered phenomenal growth of 345%, and India 59%. The picture is similar for vegetables, meat and milk, with growth substantially exceeding that of the rest of the world, due in part to higher yields (figure 3.18).

The recent shift towards non-staple crops is an important step in generating more income for the poor, but the impact appears to be limited because only a few countries have benefited from it.

Figure 3.17. Per capita production in fruits, vegetables, meat and milk, 1961-2005

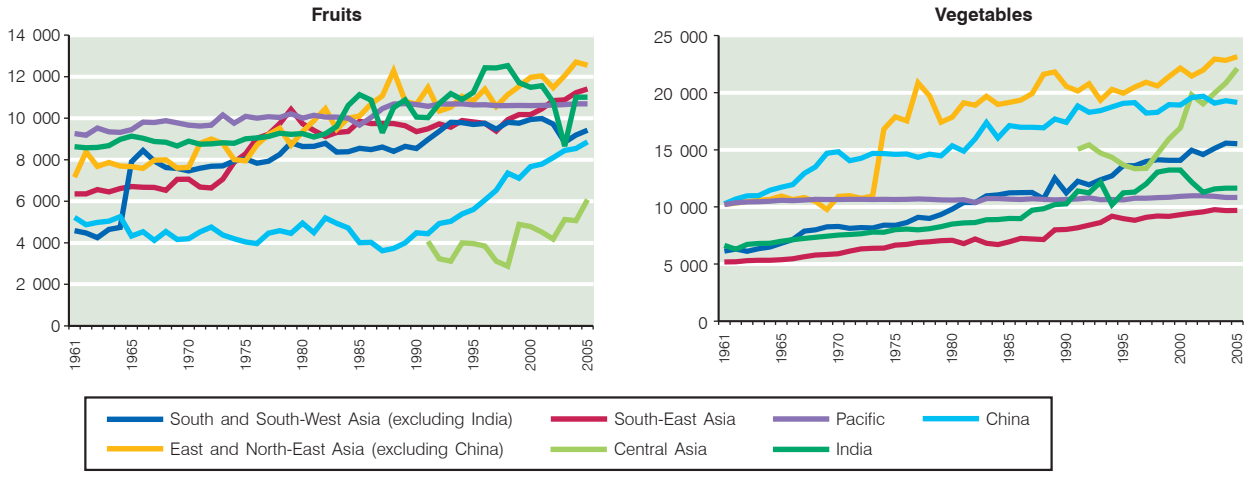
(Metric tonnes per capita)



Source: Based on data from FAO, *State of Food and Agriculture 2003-04 Database* (Rome, FAO, 2004).

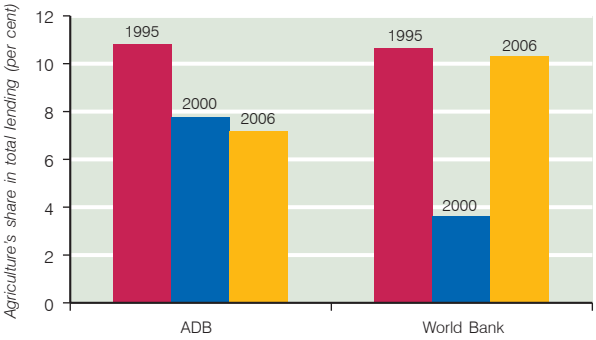
Figure 3.18. Fruit and vegetable yields, 1961-2006

(Kilograms per hectare)



Source: Based on data from FAO, *State of Food and Agriculture 2003-04 Database* (Rome, FAO, 2004).

Figure 3.19. Declining multilateral lending to agriculture, 1995-2006



Sources: ADB, *Annual Report 2006* (Manila, ADB, 2006); and World Bank, *Annual Report 2006* (Washington, D.C., World Bank, 2006).

Official development assistance for agriculture is declining

Between 1983-1987 and 1998-2000, official development assistance for agriculture fell by 57% to an annual average of $5.1 billion (Anriquez and Stamoulis, 2007). Lending for agriculture by multilateral lending agencies, such as the World Bank and the Asian Development Bank, also trended downwards. The World Bank's free-standing agricultural credit dropped from a peak of more than $1 billion in 1983 to less than $200 million in 1995. The share of agriculture in total lending to the Asia-Pacific region declined from 11% in 1995 to about 4% in 2000 before increasing to 10% in 2006 (figure 3.19). Lending for agriculture by the Asian Development Bank also declined, with the share dropping from more than 10% in 1995 to about 7% in 2006.

Two strategies to make agriculture socially and economically viable

Because most of the poor live in rural areas and depend heavily on agriculture for their survival, a policy priority should be to revitalize agriculture. Some of the poor will remain in agriculture and continue to make farming their primary livelihood. Others, however, will shift from agriculture to industry and services, which offer them a better chance of escaping poverty. Policies should be put in place to make this transformation easy. Public policy could thus adopt a two-pronged approach, taking both aspects into account: revitalizing agriculture while facilitating the migration of excess labour from agriculture to industry and services.

> *"Attacking poverty head-on requires both reviving agriculture and facilitating migration out of agriculture"*

Strategy 1: Revitalize agriculture

Revitalizing agriculture requires connecting the poor to markets by improving rural infrastructure, improving agricultural technology, increasing the capacity to adapt technologies, and speeding diversification and commercialization. It also requires improving the distribution of land and the access to agricultural credit and extension – and making macroeconomic policy friendlier to agriculture, all enabling the poor to make a dent on poverty by themselves.

Connect the rural poor to cities and markets to alleviate poverty

Connecting the rural poor to cities and markets is vital to reducing costs and risks and exploiting new opportunities. Information and communications technology could give them easier access to information on the prices of inputs and products (box 3.4). Rural roads would enable them to sell their products in the marketplace and obtain better prices. Better information would also give them a sense of market demand and of seasonal variations in produce and prices so that they can adjust their production.

Electricity and water supply appear to have the highest payoffs for the poor. Electricity could generate a multiplier effect on poverty reduction through mechanization,

Box 3.4. Improving the efficiency of farmers through technology

Telecentres called e-Choupals – established by ITC Ltd., an Indian company – have a computer with Internet access, operated by an ITC-trained local farmer. The operator facilitates the farmers' access to good practices in agriculture and to market prices for commodities. Better market information helps farmers to decide when and where to sell (in the local market or to ITC). By purchasing directly from the farmers, ITC made the channel more efficient and created value for both the farmers and the company (Bowonder, Gupta and Singh, 2003). Farmers benefit from more accurate weighing, faster processing and prompter payment. By 2007, more than 6,500 e-Choupals were operating in about 31,000 villages (Sahay, 2007).

In Malaysia's remote Bario district, telecentres (e-Bario) have improved livelihoods through education and tourism. The once-isolated community now communicates with potential tourists directly through email and confirms bookings for accommodations online. More youths are staying in Bario to run the tourist accommodation and tourist activities (ESCAP, 2006a).

Another example is the Beijing Academy of Agriculture and Forestry Science, which runs a distance education system to train farmers on the outskirts of Beijing and in the rural areas of Xinjiang and Tibet. Since 2002, its centres have provided more than 600,000 farmers with remote education by satellite (Jianxin, Sun and Luo, 2005).

The Indian Space Research Organization also uses satellites to provide remote health services for the rural poor. The medical history of the patient in rural areas is sent to specialist doctors, who study and provide diagnosis and treatment during videoconferences with patients. More than a million patients in rural areas have received health services through this system (Satyamurthy and Murthy, 2007).

entrepreneurship and human capital development. In Bangladesh, rural electrification increased study time by two hours per day and raised women's involvement in their children's education. Literacy and school enrolment were much higher in electrified areas, and service delivery was better (Songco, 2002).

Improve service delivery to boost the health and education of the rural poor

Human capital, an important ingredient in production, can help the poor acquire and adapt new technologies in agriculture. Providing education for young and adult men and women would provide some insurance against poverty. Timmer (2005) points out that expanding public spending on education had a disproportionately positive effect on the poor in Indonesia. In particular, it enabled girls to catch up with boys, virtually eliminating the gender bias. Education helps the poor raise their agricultural productivity and thus their income. It also helps them acquire the skills to move into industry and services. Better health service delivery in rural areas can add to productivity gains.

Public spending on health and education should be increased sharply, especially targeting rural areas. In addition, there should be a conducive policy and institutional environment for the private sector to engage in service delivery. This would relieve pressure on the government budget and increase flexibility in allocating funds.

Human capital development should go hand in hand with providing opportunities for employment in rural and urban areas. Establishing links with the rural non-farm sector can provide employment in both the agricultural and non-farm sectors. Special programmes could target needy poor families for skills development by providing education and employment opportunities. These initiatives could have an intergenerational effect on poverty (box 3.5).

Diversify and commercialize agriculture to tap new markets and opportunities

Diversifying and commercializing agriculture is the key to raising incomes, particularly in a globalized world where tastes and quality matter. This transformation is already under way in China, India and Thailand, but many poor developing countries are lagging. Increasing the production of rice, wheat and maize will be a focus of antipoverty programmes in many parts of Asia, but tapping highly competitive retail food markets and supermarkets, with higher quality and safety standards, will require investments in skills development and technology, including R&D and extension services.

Box 3.5. Using family histories to understand the intergenerational transmission of poverty

The retrospective family life history approach focuses on individuals and households within a larger kinship network, particularly on descendants of a common ancestor, to identify determining factors in the long-term dynamics of rural poverty. Rather than looking in detail at one or two points in time, histories generate a long-term perspective. This allows researchers to study and explain changes in time in ways that household surveys cannot (Moore, 2001). Life history interviews can register important elements in the history of individuals, even across generations, by focusing on downward and upward mobility; ownership and control of assets; inheritance; accumulation strategies; strategic decisions, such as sending children to school or migrating to other areas; and life crises and shocks leading to downward mobility (Quisumbing, 2007).

A study in the progress of families over three generations by Centre for Alleviation of Poverty through Secondary Crops' Development in Asia and the Pacific (Bottema, Siregar and Madiapura, 2007) finds that:

- Every pathway consists of sequential components: agriculture, migration, local trade, local services and agriculture again.
- The number of rural-born people returning and residing in their area of origin is very high, over 95% in the current explorative research.
- People and families have a true long-term view of how to improve their lives. This offers huge scope for local livelihood improvements and participatory methods.

The region could also benefit from agricultural biotechnology for food crops. Asia and the Pacific has so far been cautious and selective in the use of genetically modified organisms in agricultural production, due to safety concerns, but it may be worthwhile to explore their use with strict safeguards in place. Organic farming represents another possible lucrative venture, given the rising consumer demand for organically produced food products.

Don't forget staples

Staple foods have historically had a large effect on poverty reduction. In countries where a single staple dominates consumption, the production of that staple has reduced poverty more than any other. Despite the potentially large multiplier effects, market failures and political biases have undermined the agricultural sector. As a result, the productivity of most staple crops is stagnant, the area under cultivation declining, and investment in R&D for staple crops falling.

Country experiences indicate that a balanced approach could be more effective in reducing poverty. Where poverty is acute, opportunities for crop diversification may not be readily available to the poorest. For these groups, staple crop production will still have a larger impact on poverty. In Bangladesh, India, the Lao People's Democratic Republic and Nepal, an emphasis on staple crops could be the most effective route to reducing poverty among the poorest because staples dominate consumption.

Redouble investment in agricultural R&D and extension

Traditional staples and the new agriculture require upscaling R&D. The benefits are simply too large to be neglected. In the poorest region of China, 140 people can be brought out of poverty with each 100,000 yuan of extra R&D investment, against the national average of 30 people (Fan, Zhang and Zhang, 2002). Productivity increases in staples will reduce poverty. Higher value crops will enhance access to markets, both national and international. The adverse effects of climate change on agriculture will require heavy investments to develop seeds that are not only more drought-resistant, heat-resistant and flood-tolerant but scale-neutral so that the poor can benefit. According to the Intergovernmental Panel on Climate Change (2007), the rising temperatures in the coming decades could reduce South Asia's agricultural productivity by 30% by the mid-21st century (box 3.6).

> *"The benefits of R&D are simply too large to be neglected"*

Investments in R&D can also be lucrative. Of all public investments in rural agricultural R&D had the highest cost-benefit ratio (12.62), several times higher than any other (Fan, Jitsuchon and Methakunnavut, 2003). National R&D in agriculture should be redoubled at a time when ODA for agricultural research is declining and most research is governed by commercial interests. An investor-friendly environment has to be created for private engagement in R&D by resolving issues related to patents, plant breeder rights and other intellectual property.

Focus on irrigation and water management to avoid overexploitation

North-west India and the North China plain are two places where the scarcity of water has affected wheat production (FAO, 2006a). Water scarcity will also be a major issue for most other Asian countries in the near future, particularly as competition from industrial, and municipal use increases. Output increases based on irrigation will therefore be very limited, and good, effective water management will be critical. Requiring greater policy attention are water conservation, water pricing, diversions from surplus to deficit areas, and establishing and restoring water management structures and institutions. Shifts to more diversified agricultural production, with less water-intensive higher value crops, would ameliorate the impact of growing water scarcity on agricultural production.

Remove institutional bottlenecks to sustain agricultural productivity and growth

Institutional bottlenecks hinder growth in agriculture, and the disproportionate impact of weak institutions on the poor widens inequality. Providing new institutions to support agriculture and improving the efficiency of defunct or inefficient institutions can revitalize agriculture. Productivity gains, however, are possible and sustainable only if proper institutions are in place and efficiently run. Well functioning institutional structures are required in rural finance, agricultural insurance, input and output markets, land titling and leasing, agricultural R&D and extension, irrigation and water management, and health and education.

Box 3.6. Climate change likely to change the landscape of the region

With many in Asia-Pacific dependent on agriculture for their livelihoods, the impact of climate change is of great significance. If business continues as usual, the region will be reshaped by climate change:

- The world's average temperature could rise by as much as 6 degrees Celsius by the end of the century, with devastating economic and social implications. Water and agriculture are particularly likely to be affected.
- Sea levels could rise by as much as 40 centimetres by the end of the 21st century, causing landward erosion and more frequent climate-related hazards. Livelihoods, particularly of those dependent on tourism, could be affected. Some of the small island States in the Pacific could disappear. Asia is likely to lose most in aquatic ecosystems: around 30% of Asia's coral reefs could disappear during the next 30 years, compared with 18% globally.
- Increased water stress will hit 185 million to 1 billion people in South and South-East Asia. Ingress of sea water in costal areas could make the subsurface water saline in many countries where ground water is subject to overexploitation.
- Himalayan glaciers could shrink by 80% by 2030, increasing river run off, floods and avalanches. As a result, the fresh water and water for irrigation for downstream agriculture could become unsustainable.
- Floods will affect 13-94 million people in low-lying areas of South, South-East and East Asia. Bangladesh, China, India and Viet Nam will be among the most affected. Asian mega-delta regions could be under threat of intense flooding from both seas and rivers.
- Agricultural productivity is estimated to decrease by 5-30% by the 2050s compared with 1990, increasing poverty and hunger. Central and South Asia, in particular, could face crop yields lower by as much as 30% by the mid-21st century.
- Health consequences could come from a higher risk of dengue fever, particularly in China and India, where transmission rates are 50%. Other insect-borne diseases, including malaria, schistosomiasis and other viral diseases, could spread widely. Heat stress and smog-induced cardiovascular and respiratory illnesses could become common, as could water-borne diseases such as cholera and diarrhoea with the contamination of drinking water.
- Forest fires could become more frequent and intense in northern Asia and South-eastern Australia.

These effects will be felt more acutely by the poor, both rural and urban, who live and work in settlements on marginal lands and do not have the resources to insulate themselves against natural disasters and other adverse effects of climate change.

Source: IPCC, "Climate change 2007: mitigation", Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, <http://www.ipcc.ch/pdf/assessment-report/ar4/wg3/ar4-wg3-frontmatter.pdf>.

Recognize that sound macroeconomic policy is always pro-poor

A sound macroeconomic policy environment promotes growth and has a direct, positive impact on the poor. Low inflation is necessary to keep the prices of basic consumption goods low and affordable. Artificially high interest rates in most Asia-Pacific countries, indicating inefficient financial systems, can reduce investment and lead to more defaults. Maintaining positive real interest rates is a must for raising savings, but lending rates should not be kept artificially high. Exchange rates have to be stable and aligned to macroeconomic conditions. All taxes on agriculture, except sector development-oriented cesses, should be removed in view of efficiency and welfare gains.

> *"Be fair, that's all farmers want"*

Create farmer-friendly credit markets

The structural adjustment policies of the 1980s removed impediments to the interest rate structure and improved monetary management, but they have not been accompanied by micro-arrangements to counter the negative impact on agricultural credit markets in most countries. Furthermore, there is still a wide communication gap between bankers and poor farmers. As a result, the poor in rural areas have to depend on informal lenders at high rates.[9] If the debt is paid in kind (a portion of the harvest), the effective rate could be 200-300% per year.

Local credit institutions (such as cooperatives or regional rural banks with limited scope) could bridge the gap between credit institutions and farmers. Crop insurance could defend against agricultural loan defaults. Commercial bank branches could also be expanded to rural areas. Group lending along the lines of Grameen Bank could be viable for sustainable financing of agriculture, particularly through existing cooperative institutions and NGOs. Improving land ownership and entitlements and enabling the poor to use such entitlements as collateral would be the keys here. Also needed are more savings opportunities for the poor, innovative substitutes for collateral and flexible borrowing arrangements.

> *"Urgent policy attention needed on farm debt"*

Governments must be prepared for eventual intervention to ensure the flow of credit to the agricultural sector if the subprime crisis spills over to the region and curtails institutional credit.

Introduce crop insurance to mitigate crop failures and price declines

Most farm-related suicides occur because of and debts from crop failure or price declines. Many countries have crop insurance to cover crop failures, but few cover losses from price declines. Extending crop insurance to cover price declines below a cut-off could help farmers avoid extreme hardship. Rent-seeking by field officers and other malpractices have to be eliminated for the full benefits of such schemes to reach poor farmers. A positive step would be providing farmers with information on commodity prices, perhaps by establishing commodity futures markets.

Revamp land policy for socially inclusive growth

Many countries have undertaken extensive land reforms. In China, they led to significant gains in agricultural productivity and reductions in poverty. Yet for many others, the reforms are incomplete and inadequate. For example, India's land reform mainly changed tenure but not ownership. Half of India's arable land therefore remains in the hands of large landowners.

Improving efficiency in land records and administration can eliminate rent-seeking and corruption. Governments could impose ceilings on land ownership and distribute public land, but these steps would require political commitment at the highest levels. Another option is to adopt innovative mechanisms for land use, particularly in land leasing and renting. Community organizations in Pakistan lease land from landlords or the State at scale, negotiating good terms. They then lease these lands to the landless poor. As an intermediary, they fill gaps in land ownership. Removing regulatory barriers to leasing and renting land could thus help the landless poor.

[9] In Cambodia, the effective lending rate in the informal market, where the majority of the rural poor borrow, exceeds 180% per year.

Pursue fiscal decentralization to gain extra resources to meet local needs

In regions where agriculture is the major economic activity, local governments have a narrow revenue base, and the resources for development are very limited.[10] Fiscal decentralization could also affect the central government's redistributive power.[11]

To reduce the large disparities in local revenue and spending, it is necessary to widen the tax base. Increased transfers are important for equalizing revenue, and better fiscal management would reduce rent-seeking and corruption. Close coordination among local and central authorities is required to implement a national agricultural policy at local levels to achieve the desired outcomes.

Promote social mobilization to influence agricultural policy

Social mobilization puts poor people at the centre of their own development initiatives and organizes them into forums for microplanning. The potential of people in agriculture could be built on the three elements of social mobilization. First, the poor in the agricultural sector are brought into an organized fold through social mobilization. Second, the skill base of the poor – managerial, productive, technical and cooperative skills – is enhanced. Third, a financial or capital base is built to move the poor towards greater self-reliance.

Rural support programmes specialize in mobilizing the poor, something that governments are not equipped to do. As intermediaries between the government and the people, they can advocate for communities to influence public policy.

Strategy 2: Facilitate migration out of agriculture

Farmers can leave agriculture for non-farm activities in rural areas or for work in urban areas. The first requires creating opportunities in the non-farm sector – the second, urban planning. Both require better opportunities for skills development and strategies for raising overall economic growth.

Empower the poor to enter labour markets

Finding work in the non-farm sector in rural and urban areas requires skills. So, providing basic education to all can facilitate outmigration. Increasing the opportunities for technical education can build the entrepreneurial skills of young people for self-employment and wage employment. Social barriers that restrict women's access to education and participation in the labour market need to be eliminated, and better access to health care can enhance the productivity of the poor by supplementing the gains in education.

Improve urban planning

Concentrations of economic growth and opportunities for employment in cities make rapid rural-urban migration inevitable. Good urban planning and development are therefore essential to help people out of agriculture. If not properly planned and managed, urbanization could add to congestion, ill health, environmental damage and unmet demand for basic services.

Promote the rural non-farm sector

One way of managing rural-urban migration while promoting poverty reduction is to promote the rural non-farm sector, enabling the poor to diversify their income sources and insure against shocks to their agricultural income (McCulloch, Weisbrod and Timmer, 2007). Rural infrastructure is the key. Because the non-farm sector is competitive and requires better skills, the work force needs to be healthy and educated. Technology transfers and finance are also important. A little effort could bring a large reward. In Indonesia, for example, non-farm income is more than 50% higher than agricultural income. And people who migrate to non-farm jobs in urban areas earn 60% more than those in the rural non-farm sector.

Promote regional growth centres

Regional growth centres, acting as "multi-hubs" to develop peripheral communities, could become production centres and end-markets for rural products. Promoting them would address regional growth disparities – and reduce the push factors that drive the rural poor to big cities.

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[10] See Zhung (2006) for a discussion on this issue in China.

[11] For example, fiscal decentralization in China has reduced the central government's redistributive power (see Zhang and Kanbur, 2003).

Go beyond Doha agricultural trade liberalization to reap immense benefits

The benefits of comprehensive agricultural trade liberalization flow to all countries in the region, a far better option than piecemeal approaches that benefit only a few. In countries such as India, where Doha agricultural trade reforms could increase poverty, comprehensive reforms would include rationalizing subsidies and removing regulations restricting trade. Under the Doha agricultural reforms, such countries could redistribute welfare gains to the poor through progressive income taxes.

Liberalizing manufacturing and services would add to the benefits of agricultural trade liberalization, if accompanied by better facilitation. Promoting international trade can raise the net returns to farmers if post-harvest operations attract more attention. Post-harvest losses of vegetable and fruits are high. Better packaging, quality control, transport and marketing could slash these losses, enabling rural producers to increase their net incomes by about 30%.

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