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# Averting Hunger and Food Insecurity in Asia

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The recent years have seen a resurgence of economic growth in Asia. The region's growth of roughly 5% achieved in 2003 came close to the level achieved prior to the East Asian financial crisis in the late 1990s. Remarkably, too, despite this crisis that led most countries in East Asia to either a sharp economic slowdown or a contraction, the past decade had witnessed significant poverty reduction. Between 1990 and 2000, the number of people living on less than a dollar a day fell by about 243 million. Poverty incidence in East Asia declined from 29.46% to 15.6%, while that in South Asia fell from 41.3% to 31.1%. At these rates, the Millennium Development Goal (MDG) of halving by 2015 the proportion of people whose income falls below one dollar a day looks attainable for Asia. Indeed, China, Vietnam, Thailand, and Indonesia have already reached the goal, while the rest, except Sri Lanka, are on target (Table 1). The prevalence of undernourishment between the late 1980s and late 1990s also declined from 29 to 13% in East and Southeast Asia, and from 38 to 23% in South Asia (Table 2).

Even so, the region still accounts for about 60% of the world's 1.1 billion poor. The proportion of underweight children in the region fell by only four percentage points (from 35 to 31%) between the early and late 1990s (ESCAP 2003). In Cambodia, Bangladesh, India, and Nepal, almost half of the children under five years are still moderately and severely malnourished. The proportion of undernourished people in the region remains high at 16%, with very little progress in the 1990s for Bangladesh, India, Nepal, and the Philippines. Without renewed push and initiatives,

the region will likely miss the MDG of halving the incidence of hunger by 2015.

The global community's efforts in attacking poverty must focus on agricultural and rural development. Of the world's poor, 75% work and live in rural areas and 60% will continue to do so in 2025. In Asia, nearly two thirds of the poor live in rural areas; the large majority of them are dependent on agriculture and agriculture-related industries for employment and income.

In Vietnam, for instance, about 80% of the poor live in households in which the head works in agriculture (Glewwe et al. 2000). In rural Bangladesh, poverty incidence among marginal farmers is about 43%, while that among landless and nearly landless households - who make up 45% of the population and are mostly agricultural wage laborers - is about 60% (IFAD 2002). Moreover, reductions in rural poverty in the Philippines, Malaysia, Indonesia, Thailand, and India have accounted for 40 to 70% of the observed reduction in national poverty incidence (Warr 2001)<sup>1</sup>.

It is one thing, however, to say that agricultural growth and rural development are keys to the reduction of poverty and food insecurity. It is another matter to identify the key drivers that bring about growth and development in the rural economy, given fiscal constraints, political-economy considerations, and global trends in trade, finance, and technology.

This paper distills lessons from recent Asian experiences and identifies critical development

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<sup>1</sup> The rest are accounted for by urban poverty and migration.

**Table 1. Proportion of population with income below \$1 (PPP\*) per day**

	Early 1990s	2001	MDG Target 2015	Trend 2015
East Asia	29.6	15.6	14.8	7.0
Cambodia	48.3	35.5	24.2	21.6
China	31.3	18.5	15.7	9.5
Indonesia	20.6	7.2	10.3	2.0
Lao PDR	53.0	26.3	26.5	11.0
Malaysia	0.5	<2.0	0.3	0.0
Philippines	19.1	14.6	9.6	10.5
Thailand	12.5	<2.0	6.3	0.0
Vietnam	50.8	17.7	25.4	4.7
South Asia	41.3	31.1	20.6	21.5
Bangladesh	35.9	36.0	19.9	36.1
India	52.5	44.2	27.0	25.9
Nepal		37.7		
Pakistan	47.8	13.4	23.9	2.5

\* Purchasing Power Parity

SOURCES: ESCAP (2003), Figure I.2; Chen and Ravallion (2004).

**Table 2. Proportion of people who suffer from hunger**

Country	Percentage of children under 5 years of age who are moderately and severely underweight			Proportion of the population below minimum level of dietary energy consumption		
	Early 1990	Late 1990s	MDG Target 2015	Early 1990s	Late 1990s	MDG Target 2015
Cambodia	40	45	20	43	36	22
China	16	10	8	16	9	8
Indonesia	35	26	18	9	6	4
Lao PDR	44	40	22	29	24	14
Malaysia	23	18	12	3	-	2
Philippines	30	28	15	26	23	13
Thailand	26	19	13	28	18	14
Vietnam	45	33	22	27	18	14
Bangladesh	67	48	34	35	35	18
India	53	47	26	25	24	12
Nepal	49	48	24	19	19	10
Pakistan	38	38	19	25	19	12
Sri Lanka	38	29	19	29	23	14

SOURCE: ESCAP (2003), Figure I.3.

issues and options for securing rural growth and household welfare. In the next section, the paper revisits recent findings on the growth-inequality-poverty nexus. It then briefly reviews agricultural performance vis-à-vis overall growth and poverty reduction. From there it examines the implications of overarching development issues pertaining to public investment in agriculture, institutions (governance), and globalization and trade reforms, on food security and poverty reduction. It ends with some remarks.

### **GROWTH IS GOOD - BUT NOT ENOUGH**

Asia's GDP growth has consistently outpaced those of other regions of the world in the past 30 years. This growth though has not been uniform across sub-regions and countries. GDP per capita in East Asia expanded by 6%, driven by sustained growth in China, Korea, Thailand, and Malaysia. In South Asia where growth rates of output were relatively low and that of population high, this was about 3% per year. However, for India, growth in the 1990s and early 2000s gained momentum, enabling the country to join the ranks of fast growing nations in Asia.

Income growth was accompanied by poverty reduction. Based on World Bank's poverty line of one dollar (in purchasing power parity [PPP]) a day, poverty in East Asia dropped from 29% in

1990 to 14% in 2000. Performance was less stellar in South Asia: over the same period, the reduction was about 10 percentage points.

The same is observed from data based on national poverty lines, i.e., where income growth rate was relatively low, so was the rate of poverty reduction. For instance, in the past 30 years, per capita real GDP grew at an average of 1% for the Philippines, compared with 4.7% for Thailand and 4.3% for Malaysia (Table 3); average annual rates of poverty reduction were 0.9, 1.9, and 1.6%, respectively. Where high output growth has not yet been sustained for a considerably long period, economic booms have nonetheless been associated with significant abatement of poverty as in the case of the Philippines in 1985-87 and 1994-97 (Balisacan 2003). Recessions, on the other hand, have been accompanied by deceleration or reversal in poverty reduction (Deininger and Squire 1996). The harder hit economies of Thailand and Indonesia, for example, saw higher poverty rates in the aftermath of the 1997 financial crisis (Suryahadi et al. 2000; Balisacan et al. 2003; ESCAP 2003).

Estimates of the responsiveness of poverty to growth corroborate the above story. In developing economies, the elasticity of poverty headcount index to mean income ranges from -2.1 to -3.1 (Ravallion and Chen 1997; Bruno et al.

**Table 3. Annual growth of per capita GDP (%)**

	1970–1979	1980–1989	1990–1999	2000–2002
Cambodia		4.4	1.7	4.4
China	4.1	7.9	8.5	7.0
Indonesia	5.3	4.4	3.1	2.7
Korea, Rep.	6.6	6.3	5.2	5.6
Lao PDR		1.3	3.8	3.2
Malaysia	5.2	3.0	4.6	2.2
Philippines	2.9	-0.4	0.6	2.0
Thailand	4.6	5.4	4.2	3.2
Vietnam		2.1	5.5	5.7
Bangladesh	-0.3	1.7	3.0	3.5
India	0.4	3.7	3.8	3.1
Nepal	0.6	1.9	2.4	1.2
Pakistan	1.6	4.0	1.4	1.4
Sri Lanka	2.5	2.6	4.0	1.2

SOURCE: World Bank, *World Development Indicators* 2003.

1998; Adams 2002). This varies widely across and within countries due to differences in conditions prior to growth. Where access to land, credit, social services, and infrastructure is highly unequal, the response is weak as observed especially in the rural areas. Such is the experience of provinces/districts/regions/states in the Philippines (Balisacan and Pernia 2003), Indonesia (Balisacan, Pernia and Asra 2003), Vietnam (Balisacan, Pernia, and Estrada 2003), and India (Datt and Ravallion 2002).

In some cases, weak local institutions (including social capital), poor investment climate, and inward-looking policies favoring capital over labor-intensive sectors like agriculture exacerbate the feeble response.

For East Asian countries like China and Korea, the effect of growth on poverty is stronger owing to their generally more favorable initial conditions – a salient one for China being the equitable distribution of land-use rights (Fan et al. 2002). Income, besides asset, distribution also affects growth elasticities. Those with lower levels of initial income inequality have more potential to lift people out of poverty (Ravallion 1997; World Bank 2000): countries with Gini below 40 have estimated elasticities of -5.7 to -6.1; for those with Gini above 40, the range is -2.4 to -3.3 (Adams 2002).

More disaggregated data from country studies provide ample evidence that income inequality blunts the poverty impact of growth. If inequality had not changed or worsened, every 1% growth would have reduced poverty incidence in Lao PDR by 3.2% between 1992 and 1998; same for Thailand between 1988 and 1992. But the actual decline for both was about 1% (Kakwani and Pernia 2000). If growth were distributionally neutral in 1994-97 in the Philippines, poverty incidence would have fallen from 32 to 22%, instead of to 25% (Balisacan 2003). Conversely in Thailand, a 1% reduction in per capita income would have raised the percentage of the poor by 4.7%, but the actual increase in the recent financial crisis was 6.5% (Kakwani and Pernia 2000).

During growth periods in Vietnam, households who reside in communities with paved roads obtain larger increases in expenditures than those who do not; those with higher levels of education experience larger declines in poverty incidence. Households which remain poor have about twice as much debt

relative to assets compared with those who have escaped poverty (Glewwe et al. 2000).

In the Philippines, irrigation and favorable terms of trade for agriculture positively influence the living standards of the poor (apart from their indirect impact via overall income growth), as does schooling, if complemented with roads. The welfare of the poor tends to be lower in provinces governed by political dynasties than in those characterized by competitive politics (Balisacan and Pernia 2003).

In Indonesia, improvement in access to technology, such as electricity and information channels, raises the incomes of the poor (Balisacan et al. 2003). Meanwhile in India, states with lower literacy rates, higher landlessness, and higher infant mortality rates benefit less from non-farm growth (Ravallion and Datt 2002). Strong correlations among poverty, technology adoption, irrigation, agricultural productivity, education, road density, electricity, and non-farm employment growth were also observed (Fan et al. 1999).

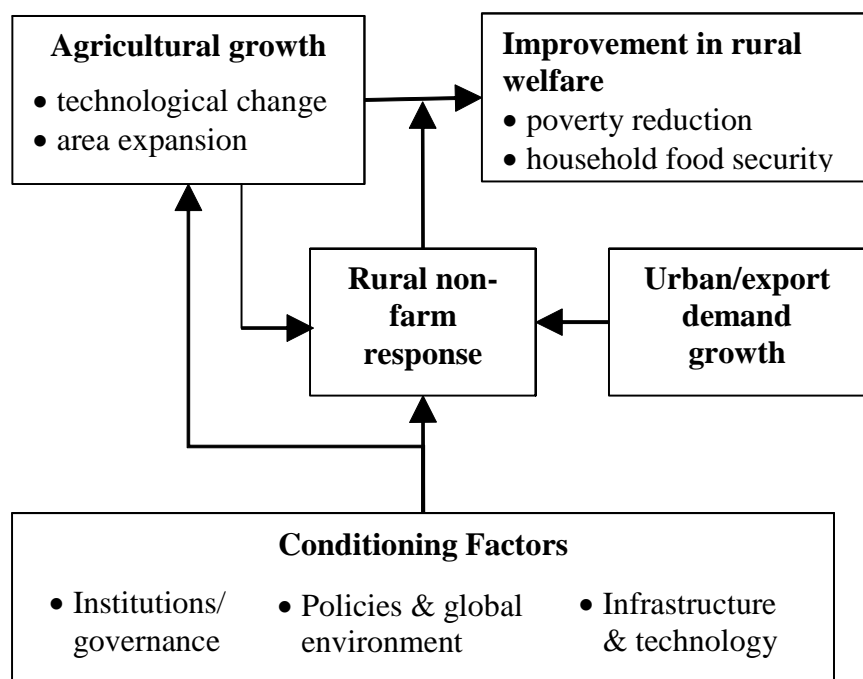
Overall, these observations suggest that policies, quality of institutions, and access of the rural population to infrastructure, credit, land, and human capital are robust predictors of income and poverty.

Evidently, the nature of growth, not just its speed, matters to poverty reduction. In this regard, the quality of growth has to be made more broadly based than it has been for a number of Asian countries. Agricultural and rural development is key to achieving broadly based growth.

## WHY AGRICULTURAL GROWTH MATTERS

As pointed out earlier, the majority of Asia's poor live in rural areas and depend on agriculture. Thus, growth in agriculture reduces poverty and food insecurity directly by augmenting farm incomes. If broadly based, this growth stimulates rural non-farm activities through demand and supply linkages, thereby increasing employment opportunities and providing enduring sources of poverty reduction.

The response of the rural non-farm sector to the stimulus of agricultural growth hinges on certain "conditioning factors," which, for present purposes, can be broadly grouped into: (1) infrastructure, broadly defined; (2) policies and global environment for trade and finance; and (3) institutions. This is illustrated in Figure 1. In what



**Fig. 1. Agricultural growth and rural welfare outcomes**

follows, the paper examines the linkages shown in the figure, as could be gleaned from the Asian experience and from results of recent empirical work.

The pace of agricultural growth in the developing countries of Asia is quite varied (Table 4). During the past two decades, agricultural growth was remarkably rapid in China, where overall growth and poverty reduction were also very impressive by international standards. This was not quite so in the Philippines and South Asian countries (except India), especially if one takes into account their much higher population growth. Agricultural growth was equally robust for the Mekong countries (other than Cambodia); this growth accounted for nearly half of the GDP growth.

#### *Sources of Productivity Growth*

Productivity growth, brought about primarily by investment in R&D and good governance, is key to sustained production growth. Total factor productivity (TFP) growth accounted for two thirds of China's agricultural output growth in 1972-95. This was driven by investments in infrastructure, irrigation, and research, especially in the latter half

of the period when the effects of institutional reforms were already exhausted (Rosegrant and Hazell 2000).

TFP growth was likewise determined by changes in these spending items in India, where its contribution to agricultural growth declined from 42% in 1975-80 to 30% in 1986-90 (Desai 1994; Desai and Namboodiri 1997), as resources were allocated more to input subsidies. By itself, public spending on research and extension accounted for 70% of India's TFP growth (Evenson et al. 1999).

In the Philippines, Thailand, and Indonesia, factor accumulation played a major role in output growth, with fertilizers accounting for 14-20%; irrigated land, 10-16%; and labor, 9-15% (Mundlak et al. 2002). Physical infrastructure (represented by roads) and human capital (represented by schooling and infant mortality) were equally important, each accounting for 10-15% of growth in agricultural output. Notably, the slowdown in agricultural growth in the Philippines, from 3.8% in 1961-80 to 1.4% in 1980-98, was largely driven by the drastic fall in TFP growth from 0.98 to 0.13% (Mundlak et al. 2002).

**Table 4. Contribution of agriculture to GDP growth, 1990-2001**

Region/ Country	Average GDP growth rate (%)	Average agriculture growth rate (%)	Contribution of agriculture to GDP growth (%)
<b>East Asia and the Pacific</b>			
Cambodia	5.02	2.00	19.03
China	9.37	4.08	8.73
Indonesia	4.71	1.94	7.11
Korea, Rep.	6.22	1.58	1.55
Lao PDR	6.28	4.97	44.13
Malaysia	6.76	0.44	0.81
Myanmar	7.05	5.65	47.88
Philippines	2.94	1.84	12.26
Thailand	4.93	1.00	2.27
Vietnam	7.32	3.87	15.44
<b>South Asia</b>			
Bangladesh	4.99	3.78	19.53
India	5.48	3.07	16.05
Nepal	4.99	2.89	24.96
Pakistan	3.89	3.81	25.54
Sri Lanka	4.76	2.09	10.08

SOURCE: World Bank, *World Development Indicators* 2003.***Food Security Performance***

Its falling shares in national income and employment notwithstanding, agriculture continues to be important to developing Asian economies, not only as it fuels industrialization, but more importantly, as it ultimately improves food security and household welfare.

Alongside growth in agricultural output, food supply per capita in Asia rose from 2,200 calories/person/day in 1970 to 2,260 in 1980, and to 2,700 in 2001. In 30 years, this figure increased from 2,030 to almost 3,000 in China. For the rest of East and South Asia, increments were lower but significant nonetheless at around 630 and 340 kcal/person/day, respectively.

If food adequacy is measured at 2,300 kcal per person per day (FAO 1999), Cambodia and Bangladesh have yet to attain the norm. Korea and Malaysia had done so before 1970; China and Indonesia, in the early 1980s; while Thailand, Vietnam, and Pakistan experienced fluctuations around the standard in that decade, but have stayed consistently above it since 1992. The Philippines

and India breached this adequacy norm only in 1989 but have maintained above-base levels since 1994. Lao PDR achieved 2,300 kcal/person/day only in 1999.

Agricultural growth in Asia was accompanied not only by higher food supplies but also by changes in diet composition, particularly shifts from vegetable to higher-quality animal products. The share of calories from animal sources increased from 6% in 1970 to 20% in 2001 in China; that of vegetable sources declined from 94 to 80%. The corresponding changes for the rest of East and Southeast Asia were from 6 to 9%, and from 94 to 91% of total calorie intake. Within the vegetable group, there was also a shift towards non-cereal away from cereal products, whose share in South Asia declined from 67% to 61% over the same period. Notably, these improvements in the quality of diet did not occur or were marginal in the Philippines, Bangladesh, and Sri Lanka.

South Asia now relies less on food aid. The quantity of cereals received by Bangladesh, India, and Pakistan from donor countries dropped from

3.1 million metric tons in 1975 to about 950 thousand metric tons in 2001.

Thus, it appears that at the macro level, availability of food in developing Asian economies has improved. The aggregates, however, gloss over the variations in food entitlements across areas or groups within countries. Stability of household food demand does not automatically follow from availability of total food supply. When economic expansion benefits certain areas only, the consequent demand-pull increase in overall prices may further restrict access to food (and other commodities) of poor households in isolated/backward communities.

The food security performance of Asian economies also shows up in the nutrition indicators. In China and Indonesia, less than 10% of the population is undernourished. Thailand and Vietnam achieved decreases of 10-percentage points in the past decade. By contrast, there has been virtually no progress in Bangladesh, India, and Nepal, which also suffer from very high proportions (about 50%) of underweight and stunted children. Much work also has to be done in Cambodia, Lao PDR, and the Philippines, where an average of 28% of the population is undernourished. In these countries then, performance has been relatively weak, not only in abolishing income poverty but also in controlling malnutrition.

Further improving food security and winning the war against poverty require nothing less than broad-based, rapid, and sustained economic growth. For developing Asian economies, agricultural and rural development is the key.

However, this does not take place in a vacuum. With respect to each agricultural input, the issues of availability, quality, accessibility, and affordability, especially by small farmers, need to be addressed. The urgency of addressing them is critical in view of the degradation of the environment, the infeasibility of further land expansion, and the deterioration of input "quality" (smaller farm sizes, aging farmers, extreme weather conditions, and incidence of new types of pests and diseases). The solution may require prioritization of public expenditure programs, policy changes, and the establishment or strengthening of national and local institutions.

## **PUBLIC SPENDING, GROWTH, AND POVERTY**

One rationale for public spending is to promote economic efficiency. Left unaddressed, market failures result in sub-optimal outcomes. So-called public goods (e.g., roads) may not be provided or may be insufficiently produced by the market. For such a good, individuals would have no incentive to pay for it voluntarily since they would benefit from its provision regardless of their contribution. Some goods and services require large-scale, long-term, risky investments (e.g., agricultural R&D) that private entities may be unwilling to make. Public spending is also carried out to stabilize the economy and to stimulate output with its multiplier effects on employment and national income.

Even in the absence of market failures, public spending may be warranted for equity reasons. Some commodities that possess private good characteristics – that is, consumption is rival and exclusion is relatively easy – are provided or subsidized by the government to ensure access of the poor to these welfare-improving assets. Education, for example, allows the acquisition of knowledge and skills that increase the productivity of labor – the poor's most basic and often only asset – and enhances employment opportunities in both farm and non-farm sectors. In agriculture, it enables the adoption of more advanced technologies that bring about higher yields. Furthermore, investment in education has reinforcing effects on poverty through health, nutrition, and fertility.

Governments spend on health not only to correct insurance market failures but also to provide affordable medical services. This comes from recognizing that better health (as well as nutrition and sanitation) contributes to productivity and incomes of the poor, for instance, by reducing work hours lost due to illness and improving one's capacity for learning.

Hazell and Haddad (2001) point to the following benefits that can be derived by the poor from agricultural research: (1) increased own-farm production, providing more output for consumption and sale; (2) greater agricultural employment opportunities and higher wages within the adopting regions; (3) more opportunities for migration; (4) development of non-farm economy in both rural and urban areas; (5) lower food prices; (6) greater



physical and economic access to more nutritious crops crucial to the well-being of the poor, particularly women; and (7) empowerment of the poor by increasing their access to decision-making processes, enhancing their capacity for collective action and reducing their vulnerability to economic shocks via asset accumulation.

The living standards of the poor are also enhanced by infrastructure such as roads, electricity, and information and communications technology. Farm-to-market roads, for example, enable the producers to bring their raw agricultural produce to markets in urban areas where their products could command higher prices. Moreover, low transport and communication costs strengthen the employment-creating linkages between agriculture and the rest of the economy. Hence, low transaction costs amplify the response of poverty to agricultural and urban demand growth.

In turn, the employment and income generated by public investments in these assets enable the poor to invest more in technology, human capital, and other resources (e.g., land).

Empirical studies have estimated the rates of return on and the poverty effects of these assets, but very few used a comprehensive set of public investment data primarily to assess the impact of various types of government spending on poverty.

Returns to education are typically at 12% or more, and are highest for primary education in China, Nepal, Thailand, Vietnam, and the Philippines, where social rates of return are also greater than private returns (Psacharopoulos and Patrinos 2002).

In Vietnam, an additional year of formal schooling of the household head raises the relative probability of escaping poverty by about 11% (Glewwe et al. 2000), while an extra year of primary education increases crop income by about 8% of the mean (van de Walle 2000). Household attributes are likewise important in the Philippines where the head's education accounts for 30% of the observed variation in household welfare (Balisacan 2003), and in Bangladesh where the spouse's level of education is also important to poverty reduction (Wodon 1999).

In Indonesia, each primary school constructed per 1,000 children increases the education of those aged 2 to 6 by 0.12 to 0.19 years, and wages by

1.5 to 2.7% (Duflo 2001). Improvement in human capital, proxied by adult literacy, reduces poverty principally via growth (Balisacan et al. 2003), and changes in public spending on primary education are most strongly felt by the bottom two quintiles (Lanjouw et al. 2001).

Among public investment variables in rural China, education has the second highest return to agricultural GDP (next to R&D), and the third highest with respect to total rural GDP. In reducing poverty, it has the largest impact with nine persons brought out of poverty per 10,000 yuan of additional investment (Fan et al. 2002). Similar analysis for India yielded 41 persons, for an incremental education spending of one million rupees (Fan et al. 2000). Non-farm growth in this country is more pro-poor in states with higher female literacy and lower infant mortality rates (Ravallion and Datt 2002).

Infrastructure affects growth positively (Jacoby 2000; Balisacan et al. 2003; Fan et al. 2002) as well as improves the welfare of the poor. Assessments of rural road projects show the poorest households deriving substantial benefits though equity impacts are less clear (Jacoby 1998; Jacoby 2000 as cited by Fan et al. 2002; Van de Walle and Cratty 2002).

In rural China, an additional 10,000 yuan of public spending on roads lifts three persons out of poverty. A 100 billion rupee increase in road investment reduces rural poverty incidence in India by 0.65%, with 124 persons raised above the poverty line for every one million rupee of incremental spending (Fan et al. 2000).

In Vietnam, households who live in communes with paved roads experience larger increases in expenditure during growth years, and have a higher probability of escaping poverty than those in communes without paved roads (Glewwe et al. 2000).

The same is observed for households with access to electricity, which, in the Philippines, accounts for 22% of the variance in household welfare (Balisacan 2003). In Indonesia, poverty incidence is more responsive to growth in good road provinces (Kwon 2000), and a 10% improvement in access to technology raises the incomes of the poor by around 2% (Balisacan et al. 2003). Where public investment in electricity

has already been substantial as in India and China, marginal returns are already low (Fan et al. 1999; Fan et al. 2002).

Meanwhile, higher agricultural productivity from irrigation tends to improve the living standards of the poor (Glewwe et al. 2000; Balisacan and Pernia 2003).

Spending on agricultural research and development (R&D) not only accounts for a significant share of TFP growth in Asian agriculture (Evenson et al. 1999; Evenson and Gollin 2003; Rosegrant and Hazell 2000), but also yields high rates of return (ROR).

For China, RORs range from 36 to 90% (Fan 2000). Out of 65 studies on the marginal internal rate of return to agricultural research for Asia, 41 showed that it exceeds 50%; for 20 studies, it lies between 20 and 50% (Rosegrant and Hazell 2000). Per yuan of public spending on R&D increases agricultural and total rural GDP by about 10 yuan each; additional investments of 10,000 yuan lift seven persons out of poverty (Fan et al. 2002). In India, a million rupees of additional public investments on R&D raise 85 persons above the poverty line through improved agricultural production (Fan et al. 2000).

Indicators of investment intensity in agriculture generally reveal decreases over the past 20 years (Table 5). For the entire region, public

spending on agriculture as a percentage of agricultural GDP declined from 10% in 1980 to 8% in 1998. This was about the same figure posted by China and India, which notably used to invest twice as intensively as the former in 1990. The share of public spending on agriculture to total government spending shows a clearer downward trend: between 1980 and 1990, it fell for all countries except the Philippines, Korea, and Thailand; between 1990 and 1998, it declined for all countries except China and Myanmar, hence, the reduction of five percentage points between 1980 and 1998 in agriculture's share in total spending for the entire region.

Estimates of public expenditures on rural areas further highlight the important role of government spending on growth and poverty reduction.

In rural China, public spending on irrigation expanded at an annual rate of 12% between 1953 and 1997 (Table 6). This and agricultural R&D accounted for 25% of total government spending on rural areas. China also made huge investments in education, which grew 6% per year and whose share in total spending remained high at 41%. Infrastructure – roads, power, and communication – composed 34% of total rural spending, up from only 7% in 1953.

**Table 5. Intensity of public spending on agriculture**

	Total Agri Expenditures, in 1995 PPP dollars (billions)			Agri Expenditures in Total Government Expenditures (%)			Agri GVA in GDP (%)		
	1980	1990	1998	1980	1990	1998	1980	1990	1998
Bangladesh	0.73	1.60	2.87	13.0	12.0	11.9	49.6	29.4	24.5
China	24.00	28.91	57.53	12.2	10.0	10.7	30.1	27.0	18.6
India	26.01	44.51	43.52	27.8	20.7	14.5	38.6	31.3	27.7
Indonesia	4.91	5.82	6.98	10.8	8.3	7.2	24.0	20.4	18.1
Korea, Rep.	1.72	6.51	10.57	5.6	9.5	8.1	14.8	8.5	4.9
Malaysia	1.55	2.25	1.33	8.7	6.7	3.4	22.6	15.2	12.6
Myanmar	1.41	0.64	0.77	23.6	9.3	14.4	46.5	57.3	59.0
Nepal	0.27	0.27	0.29	16.1	8.4	6.1	61.8	51.6	39.9
Philippines	1.52	2.95	3.22	6.1	6.8	5.8	25.1	21.9	16.9
Sri Lanka	3.00	0.62	0.69	28.6	5.7	4.8	27.6	26.3	21.1
Thailand	2.09	3.60	4.83	9.7	10.4	7.5	23.2	12.5	12.7

SOURCE: Fan and Rao (2003), Tables 1 and 3; World Bank, World Development Indicators 2002

**Table 6. Public spending in rural China, 1953-97 (millions of 1990 yuan)**

Year	R&D	Irrigation	Education	Roads	Power	Communication
1953	17	177	2,584	194	3	18
1955	55	530	2,490	224	13	26
1960	770	5,291	6,314	510	78	193
1965	584	2,520	4,405	424	136	110
1970	657	3,416	3,060	537	287	156
1975	883	5,859	6,944	572	623	278
1980	1,295	7,457	10,660	693	988	237
1985	1,764	5,183	19,025	1,253	2,565	457
1990	1,625	7,164	25,006	2,559	4,968	1,078
1995	2,267	15,417	34,139	5,673	9,597	7,795
1997	2,170	23,415	41,024	10,700	14,147	9,350
Annual growth rate (%)						
1953-78	19.14	17.55	4.55	5.37	26.85	12.44
1979-89	2.89	(5.26)	9.56	11.01	14.81	13.21
1990-96	4.21	18.43	7.33	22.68	16.13	36.15
1953-96	11.63	11.74	6.48	9.54	20.79	15.28

SOURCE: Fan, Zhang, and Zhang (2002), Table 3.1.

Electricity investments, in particular, have been substantial. As a result, nearly 100% of villages and households have been energized by 1996 (Fan et al. 2002). Telecommunications spending grew from 1 billion yuan in 1990 to 9 billion yuan in 1997, and together with private expenditures, generated a 600% increase in the number of rural telephone sets. Econometric estimates by Fan et al. (2002) confirm that such government expenditures contributed to the improvement of irrigation, to the development of roads, to rural education and communication, and to the increased use of electricity. These in turn enhanced, in varying degrees, productivity, wages, and employment in both the farm and non-farm sectors, and reduced rural poverty incidence, which is now at less than 5% of the population (based on official estimates).

Parallel results were obtained from state spending data for India where the bulk of the resources was allocated to development items, that is, social and economic services (Fan et al. 1999). Social services, which include education, health, and welfare, composed 47% of development spending (and 35% of total state spending), while the rest went to economic services, composed of agriculture, irrigation, transportation, power, and rural development. Annual growth rates of welfare

and rural development spending were highest, while other items posted respectable growth rates of 5-9% in 1970-93.

Agriculture and irrigation spending, in particular, expanded by 6.5% and 5% per year, respectively. Fan et al. (2000) noted that the downward trend in rural poverty from the late 1960s to late 1980s coincided with the rapid adoption of HYVs and improved irrigation, which in turn were a direct result of public investment in R&D and extension, infrastructure, irrigation, and education.

In the Philippines, public spending on agriculture has not only been inadequate but also misallocated. Government expenditure on R&D averages only 0.3% of GDP, while that of Malaysia and Thailand are 1.1% and 1.6%, respectively (David 2003). Long-term productivity-enhancing types of investments account for less than 50% of total agriculture spending. Shares of R&D and infrastructure in 1998 were 8% and 5.5%, while a hefty 19% went to land acquisition and distribution. Production support, postharvest facilities, and price stabilization cornered 12% of agricultural spending.

Moreover, irrigation, infrastructure, and other developmental projects have been plagued by corruption, poor quality and design, and (the

resultant) high maintenance costs. Such weaknesses may have muted the poverty impacts of public investments.

Evidently, countries whose governments spent more on agricultural and rural development obtained larger and more rapid reductions in poverty. It is not only the amount of resources that matters though, but also its allocation. Making effective and efficient investments is even more vital for developing countries where government resources are limited, and where comprehensive income taxes are generally not a viable option for redistribution. Bigger gains from public spending in terms of poverty alleviation, are derived from long-term, productivity-enhancing investments. Also, whether the benefits of public spending materialize and accrue to the poor ultimately hinges on the efficiency of implementation.

While the existing literature has adequately shown that certain types of assets and public investments in them are income-augmenting and poverty-reducing, it falls short in addressing complementarities among assets. There may be enough health centers and schools in rural areas, but the poor will not benefit from them unless there are good roads to make these services accessible. Distributing land to poor farmers enables them to have command over another major resource, but lack of credit may hinder them from making productive use of this asset.

For instance, the level of education of the mother has been found to positively affect the health and nutritional status of children (Skoufias 1999; World Bank 2000; Lanjouw et al. 2001). In the Philippines, a year of education increases annual income by about 13,000 pesos on the average, but this is augmented by an additional 2,000 pesos if the household has electricity (Barnes 1997 as cited by World Bank 2000). In Indonesia, electricity positively influences the income of the poor through growth, with direct effects clearer for the upper quintiles, implying that some minimum level of income and complementary facilities is required to benefit from electricity (Balisacan et al. 2003). Rural electrification, meanwhile, raises the use of irrigation in Bangladesh and India where poverty incidence has been significantly reduced (Songco 2002).

Balisacan and Pernia (2003), using provincial panel data, found that by itself, the roads variable has a negative coefficient with respect to the income of the poor, suggesting that roads do not typically reach the areas where most of the poor live and, where they do, they may exert an adverse impact through factor market, political economy, and other processes.

But when schooling is interacted with roads – which are a proxy for access to markets and social services – the coefficient is positive and significant. In Figure 2, the impact of raising average province-level schooling on returns (in terms of changes in quintile mean expenditures) to roads is shown for the bottom two and top quintiles. The contrast suggests that higher schooling allows the poor to benefit directly from overall road development. Put differently, road access can improve the income of poorer groups provided they have sufficient human capital to take advantage of it.

In Vietnam, benefits from irrigation investments are larger for those with higher levels of schooling: an increase in all adults' education levels raises the net marginal effect of irrigation on crop income by 19%; in the primary schooling of all adults, by 36%. Because of this interdependence, the presence of inequalities in education, correlated with levels of living, results in smaller returns to irrigation for the poor. Thus, irrigation investment, without a corresponding educational investment, may actually increase inequality (Van de Walle 2000).

Ravallion and Datt (2002), testing an empirical model that allows for multiplicative interactions of the sectoral composition of growth with initial conditions, found that higher initial farm yield, higher initial female literacy rate, lower initial infant mortality rate, and lower initial landlessness amplify the responsiveness of state-level poverty measures to non-farm growth in India.

Of these variables, literacy (plotted in Figure 3 with each state's headcount elasticity) exhibits the most significant interaction effect with non-agricultural output growth. An illustration was made for the state of Bihar, which had a female literacy rate of 6.9% in 1960. If it had Kerala's literacy rate of 38.9%, Bihar would have had an

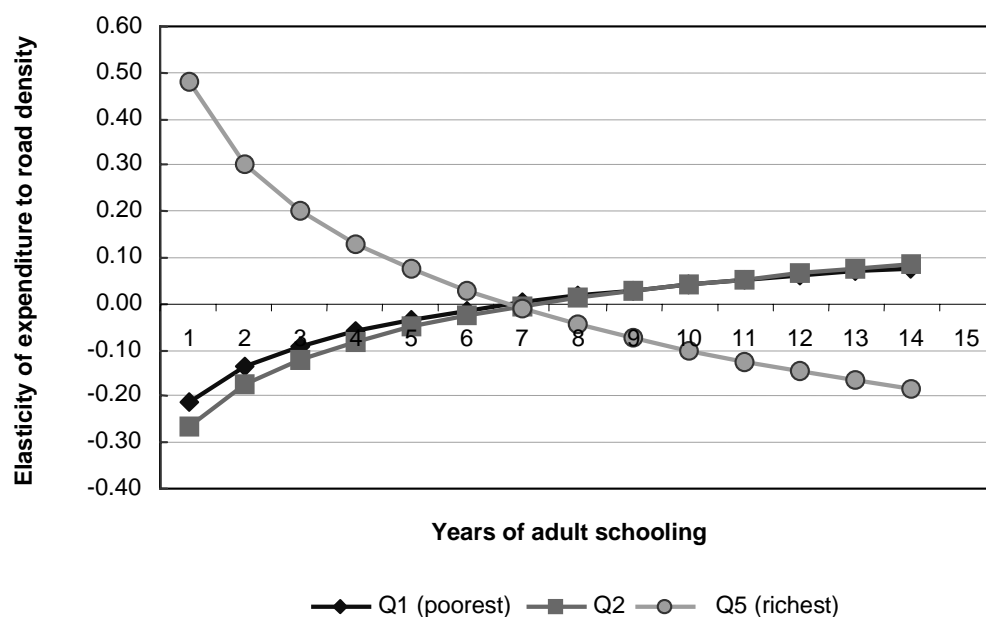
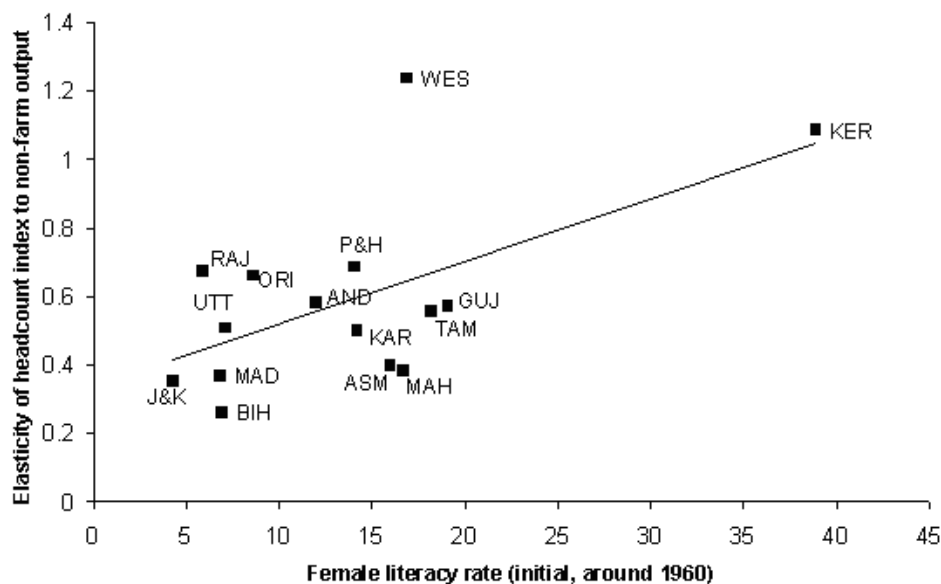


Fig. 2. Schooling and road impact



AND=Andhra Pradesh; ASM=Assam; BIH=Bihar; GUJ=Gujarat; J&K=Jammu and Kashmir; KAR=Karnataka; KER=Kerala; MAD=Madhya Pradesh; MAH=Maharashtra; ORI= Orisa; P&H=Punjab and Haryana; RAJ=Rajasthan; TAM=Tamil Nadu; UTT=Uttar Pradesh; WES = West Bengal  
 SOURCE: Ravallion and Datt (2002)

Fig. 3. Absolute Elasticities of Headcount Index to Non-Farm Output and Initial Female Literacy Rates, Indian States

absolute elasticity of headcount index to non-farm output per person of 0.79, instead of 0.25.

Thus, the benefits that the poor (as well as the non-poor) can derive from the provision of a certain asset are influenced by initial conditions in other assets. From the viewpoint of public finance, this suggests that in assessing the poverty impact of a specific type of investment, or when ranking the returns to various types, these interactions must be accounted for.

Even if this complementarity is addressed by the economic model used, one must additionally be cautious in prescribing the same set of public spending policies to countries or regions within countries. The response of poverty to public investment (and growth) varies significantly across areas and depends on initial conditions. In China, for instance, the marginal returns of public spending are much higher in the western region – where road density, telecommunications access, and labor productivity are lowest, and illiteracy and poverty rates highest – than in the central and coastal regions (Fan et al. 2002).

What is needed then to maximize the poor's benefits from government spending is a prioritization of public expenditure programs that build on the synergies among different assets and cater to the specific needs of each area or group.

### **INSTITUTIONS, POLICIES, AND RURAL DEVELOPMENT**

The prevailing wide disparities in income between rich and poor countries have engendered varied explanations as to the fundamental causes of growth and poverty.

One view maintains the overwhelming role of geography in income determination. Geographical and ecological variables, such as climate zone, disease ecology, and distance from the coast, are held to be strongly correlated with per capita income and other economic and demographic variables (Sachs 2003a). For instance, zones with tropical climates – which are weighed down by many infectious diseases and face special problems of agricultural management – are characterized by low agricultural productivity and levels of income (McArthur and Sachs 2001). Remote regions with few natural resource endowments, high disease prevalence, and immobile factors of production are disadvantaged

by high transactions costs of trade, tourism, migration, and technological diffusion (Sachs 2003b). Indirectly, unfavorable geography apparently leads to even lower levels of welfare if it comes with a “predatory or exploitative government” (Gallup, Sachs, and Mellinger 1998).

The second view upholds the preeminent role of institutions in explaining differences in income and welfare, arguing that prosperous countries tend to have good institutions characterized by:

*“enforcement of property rights for a broad cross section of society, so that a variety of individuals have incentives to invest and take part in economic life; constraints on the actions of elites, politicians, and other powerful groups, so that these people cannot expropriate the incomes and investments of others or create a highly uneven playing field; and some degree of equal opportunity for broad segments of society, so that individuals can make investments, especially in human capital, and participate in productive economic activities” (Acemoglu 2003).*

Proxied by measures of property rights and the rule of law, the quality of institutions is found to be the only positive and significant determinant of income levels (Rodrik et al. 2002)<sup>2</sup>. After controlling for this, geography has, at best, weak direct effects on incomes, though it has a strong indirect effect through the quality of institutions. Likewise, trade or openness (to which the integration view assigns the dominant role) is found to have no direct positive effect on income, but it has an indirect one through institutions.

<sup>2</sup> Rodrik and Subramanian (2003) refer to those that protect property rights and ensure that contracts are enforced as market-creating institutions since, in their absence, markets either do not exist or perform very poorly. Supporting institutions are classified as (1) market regulating: those that deal with externalities, economies of scale, and imperfect information like regulatory agencies; (2) market stabilizing: those that ensure low inflation, minimize macroeconomic volatility, and avert financial crises, e.g., central banks, exchange rate regimes, and budgetary and fiscal rules; and (3) market legitimizing: those that provide social protection and insurance, involve redistribution, and manage conflict.

Additionally, institutional quality has a positive and significant effect on integration, while the latter also has a positive impact on the former (Rodrik et al. 2002). Better governance enhances growth (Kaufmann et al. 1999; World Bank 2000), reduces its volatility (Edison 2003), and improves the availability and quality of public services, and the extent to which the poor have access to them (Deolalikar et al. 2002).

While the importance attached to policies varies, the observed correlation between institutions and policies suggests that sound policies need to be supported by good institutions, while weak institutions reduce the likelihood that policies adopted are good and will be effective (Edison 2003). The Asian financial crisis, for example, showed that policies alone, without strong institutions, were incapable of preventing the fall in incomes and welfare. In some countries, secure property rights over land cushioned the adverse effects of the crisis.

Thus, if there is one point of agreement among the different views, it is that geography, institutions, and policies are all interlinked and jointly determine the levels of income and welfare. But what do the above findings suggest for agricultural and rural development?

Where geography is unfavorable, there is even greater need for productivity-enhancing investments in agriculture. Land, the essential factor of production, is immobile. This implies that complementary inputs would have to be brought in. Outputs meanwhile would have to be transported to the markets. Also, farmers need market information, which is costly to acquire and transmit given the spatial dispersion of agricultural production (Binswanger and Rosenzweig 1986). To improve the welfare of the poor, the necessary transactions costs of trade, migration, and technology and information diffusion must be brought down through, for instance, the provision of good rural infrastructure.

Good institutions are even more crucial for agriculture, which is replete with market failures and risks. The seasonality and synchronic timing of operations in agriculture require adequate provision of credit and insurance to small farmers, who are most vulnerable to income shocks. But markets for credit and insurance are least developed

in rural areas due to incentive problems, high information costs, and the default, yield, and price risks associated with agriculture.

Moreover, small farmers need to be given secure property rights over land. Insecure tenure creates uncertainties and leads to sub-optimal outcomes both for short-term agricultural output and sustainable development. While ownership of land can be the surest way to have access to land, it does not have to be the only way. In fact, with competing uses of land, ownership may not even be affordable. The more important thing, though, is that property rights are properly defined; that there are regulations pertaining to leasehold and even tenancy arrangements. Institutions addressing these issues must be strengthened to ensure a more level playing field for the poor.

Contrary to persistent claims that agricultural supply is not responsive to price incentives, evidence and the Asian experience prove that it is. For instance, relentless pursuit of import-substituting strategies during the 1960s and 1970s and overvaluation of the foreign exchange in most Asian developing countries depressed the domestic price of tradables, including agriculture, relative to non-tradables. This encouraged movement of resources away from agriculture.

The premature shift of resources away from agriculture has resulted in the dampening of growth of employment opportunities and output in rural areas. At the same time, real incomes of rural workers fell as demand for commodities they produce decreased. Hence, in terms of policies, efforts towards agricultural development should involve reforming incentives in the agriculture sector and the rest of the economy.

#### **GLOBALIZATION, TRADING REGIME, AND WTO AGRICULTURE NEGOTIATIONS**

While geography, domestic policies, and institutions play a significant role in promoting pro-poor rural growth, so do the global trading regime for agriculture and the external forces associated with globalization.

Many contend that the twin forces of globalization and agricultural trade liberalization are a bane to the poor in developing countries. The main argument is that developing countries have neither the broad infrastructure nor the institutions

to effectively gain from globalization and trade liberalization; that they, in fact, have experienced increases in inequality and poverty.

Recent evidence, however, does not lend support to this contention. Developing-country globalizers had accelerated growth rates, from 2.9% per year in the 1970s to 3.5% in the 1980s, and 5% in the 1990s. In contrast, the corresponding per capita GDP growth rates for non-globalizers were 3.3%, 0.8%, and 1.4%. The number of poor in globalizing developing-countries dropped by 120 million between 1993 and 1998, while it increased by 20 million in the non-globalizing developing world. Poverty reduction in rapidly globalizing China and Vietnam, in particular, is unprecedented in history. The reduction has also been substantial in India (since the late 1980s) and other globalizers in the region.

While the Asian financial crisis reduced incomes in the two worst-hit countries, namely Indonesia and Thailand, the gains in poverty reduction during the past-quarter century of growth and trade liberalization have largely remained intact. Though factors other than integration affect growth, trade openness – particularly, expanding agricultural exports – has nonetheless been shown to contribute to the improvement in overall incomes, which benefits the poor (Dollar and Kraay 2002; World Bank 2001, 2003).

As regards trade and inequality, while there are winners and losers as well as risks associated with globalization<sup>3</sup>, the evidence shows no systematic relationship between the two: some countries that opened up did experience increases in inequality; others did not. Dollar and Kraay (2002), for instance, found no significant correlation between changes in trade to GDP ratio and changes in the Gini coefficient. A simulation made for globalizers reveals that if trade volumes are increased by 34 percentage points of GDP and inflation is decreased by 12 percentage points, the growth rate of income of the poor would be 2.6 percentage points higher. Of this, 2.2 percentage points are due to increased trade openness, with the bulk coming from growth effects; distribution effects are not significantly different from zero.

Even more fundamental is the additional argument that in practice, “free trade” in agriculture is not “fair trade” since the developed countries continue to provide enormous subsidies to their farmers (thereby limiting the access of developing countries to their domestic markets), while the developing countries have taken great strides in fulfilling their part of the bargain (i.e., opening up their domestic markets).

Substantial reductions in tariffs, domestic support, and export subsidies, have been the main issues tackled in the WTO agriculture negotiations. Adding to work undertaken since the start of negotiations in early 2000, the November 2001 Doha Ministerial Declaration reconfirmed the objectives of establishing a fair and market-oriented trading system through a program of fundamental reforms encompassing strengthened rules and specific commitments on support and protection in line with Article 20 of the Agriculture Agreement.

The declaration also made non-trade concerns, and special and differential (S&D) treatment for developing countries integral to the WTO negotiations, emphasizing that all S&D provisions should enable developing countries to meet their needs, in particular, food security and rural development.

While the global trade talks also dwell on non-farm trade, services, dispute settlement, and the “Singapore issues” of investment, competition, trade facilitation, and government procurement, agriculture is of primary importance to the development promise of the Doha Agenda, given that the majority of the poor work in the sector and that agricultural products are subject to the highest barriers to trade.

Recent World Bank estimates reveal the extent of protection of agriculture in developed countries. About 28% of domestic production in OECD countries is protected by tariff rate quotas. Support to producers in these countries, through higher domestic prices and direct production subsidies was \$248 billion in 1999-2001, two thirds of which came from border barriers or market price support mechanisms. Imports from developing countries face tariff peaks as high as 500%.

Calls from poor countries for rich countries to eliminate these trade barriers and the latter’s firm stand of keeping them have resulted in a standoff

<sup>3</sup> See Stiglitz (2001) for a discussion.



in the agriculture negotiations and the overall failure of the September 2003 Cancun Ministerial Conference, which sought to “take stock of progress in the [Doha Development Agenda] negotiations, provide any necessary political guidance and take decisions as necessary.” No agreement was made on the agriculture negotiations modalities: targets (including numerical ones) and issues related to rules that members are to use in achieving “substantial improvements in market access; reductions of, with a view to phasing out, all forms of exports subsidies; and substantial reductions in trade-distorting domestic support.”

The Conference – which also welcomed Cambodia and Nepal as the first - least developed countries to accede to the WTO since its establishment – concluded instead with a ministerial statement, instructing officials to “continue working on outstanding issues with a renewed sense of urgency and purpose and taking fully into account all the views” expressed then.

While the Cancun Conference has proven that, collectively, developing countries could make a lot of difference in the outcome of the negotiations (“no deal” in this case), it has also shown how unrealistic it is to expect developed countries to completely undo their policy of protecting local producers from international competition. Domestic support and export subsidies did not come out of a vacuum but evolved out of changes in the balance of political influence among competing groups in society (farmers, consumers, and industrialists) in the course of economic development.

More importantly, both sides apparently have yet to recognize the losses engendered by the status quo. The World Bank (2003) illustrates a scenario where tariff peaks in agriculture are cut back to a maximum of 10% for rich countries and 15% for poor countries, and those in manufacturing are scaled down to a maximum of 5% for developed countries and 10% for developing countries. Combined with elimination of export subsidies, decoupling of all domestic subsidies, and the elimination of the use of specific tariffs, tariff rate quotas, and anti-dumping duties and sanctions, the global economy would derive \$291 billion in gains – about three-fourths of the total potential gains from full merchandise trade reform. An estimated \$193 billion of this would come from reforms in

agriculture and food, and the remaining \$98 billion from that in manufacturing.

Of the \$291 billion, about \$159 billion would accrue to developing countries. Of this, \$101 billion would come from lowering barriers in agriculture and food, and \$58 billion from manufacturing. Eighty percent of the poor countries’ gains from freer trade in agriculture would be derived from own-reforms in this sector, while 20% would come from reforms in rich countries. It thus appears that reforms even within developing countries would have high dividends.

Not only would trade and incomes increase; more importantly, this scenario would substantially reduce the number of the poor. Globally, the number of persons living on less than \$2 a day would fall by 144 million. In East Asia and the Pacific, the reduction would be no less than 40 million, while in South Asia, it would be no less than 10 million.

Thus, the benefits of open and non-discriminatory multilateral trading systems are so enormous that for developing countries to withdraw from future agriculture negotiations or put back protectionist trade measures would be a big mistake. Their economies depend heavily on their export markets, and the linkages between agriculture and the rest of the economy cannot be overemphasized. Moreover, freer trade regimes and better government focus on support services would allow more efficient resource allocation among and within sectors of these economies, thereby providing an enduring foundation for sustained rural growth, food security, and poverty reduction.

The formation of regional blocks and/or bilateral trade agreements would be a poor substitute to a multilateral trade arrangement.

What is needed for future negotiations is a practical approach that recognizes the reality of political and economic constraints to domestic policy reform. Proposals, for example, for a complete elimination of agricultural subsidies in developed countries are not credible and feasible.

## CONCLUDING REMARKS

In many countries of the Asian region, both domestic policies and institutions have constrained efficiency and raised the “cost of doing business” in agriculture, thereby blunting productivity growth and eroding competitiveness in the global

marketplace. Liberalizing agricultural trade enhances the welfare of the poor, especially the landless workers and urban consumers, although the short-term cost to the sector in terms of reduced incomes and labor displacement may be quite substantial.

However, when this is combined with public investment in productivity-enhancing support services (particularly R&D and irrigation), agricultural trade liberalization is likely to be a win-win proposition.

In addressing today's pressing issues vis-à-vis poverty and food insecurity, it is important not to lose sight of the key lessons in agricultural growth and development in Asia in the past half-century.

One such powerful lesson has to do with enabling the rural poor through policy, investment, and institutional reforms that enhance the efficiency of domestic markets and provide improved access to technology, infrastructure, and education. This enabling environment allows rural growth benefits to be broadly based, thereby enhancing overall nutrition, human capital development, and productivity and economic growth in the medium- to long-term.

Almost invariably, the successful cases of rural development and poverty reduction have shown tenacity in the pursuit of efficiency-enhancing reforms. The key driver to these reforms has been neither globalization nor agricultural policy in developed countries. Rather, it is, by and large, the internal realization that reforms are for the benefit of the country and its citizens.

Globalization has its downside, but it also offers potentially enormous benefits. Many developing-country-globalizers have shown that those benefits more than outweigh the costs; for example, the speed of poverty reduction is unprecedented in China, Vietnam, and India. The challenge for most countries in the region is to find the appropriate mix of policies and institutions needed to exploit the benefits, while being on guard for the costs.

Fortuitously for agriculture and the rural sector, the key policy and governance reforms – enhancing economic competition, investing in efficiency-enhancing infrastructure and support services, and enabling institutions to efficiently respond to changes in economic landscape –

required for improved efficiency (increased productivity and income) are largely compatible with globalization as well.

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