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AGRICULTURE AND STRUCTURAL CHANGE:

POLICY IMPLICATIONS OF DIVERSIFICATION IN ASIA AND THE NEAR EAST

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ABSTRACT

Agriculture and Structural Change:

Policy Implications of Diversification in Asia and the Near East

In the mid-1980s, the rice-based and wheat-based economies of Asia and the Near East began to face the problem of widespread surpluses, which forced down rice and wheat prices in domestic and international markets. The resulting low incomes for farmers who were not protected from price declines caused these farmers to search for alternatives to rice or wheat cultivation. Countries that kept domestic prices above the low prices in the world market often faced large budgetary costs, and these governments sought to diversify their farmers out of the basic food staple. Donor agencies, especially the World Bank and the Asian Development Bank, found their agricultural portfolios heavily invested in rice-specific irrigation systems, with very low economic returns being generated when evaluated at world prices. Rural diversification thus became a vehicle for alleviating the distress caused at three levels--farmers, governments, and donors--by the collapse of world wheat and rice prices under the pressure of large supplies in the mid-1980s.

Designing and implementing new policies and investment strategies to foster rural diversification turned out to be a complicated undertaking, however. Two major trade-offs surfaced very quickly as governments attempted to respond to the "crisis of success." First, a concern for income distribution--farm incomes were already lower than urban incomes--conflicted fairly directly with efficiency considerations, at least in the short run, and governments found it difficult to choose one or the other or an appropriate balance of the two. Attempts to have more of both created a second important trade-off, between incurring large budgetary costs to stabilize rice or wheat prices and passing on the costs to consumers. The dilemma for these countries, especially the ASEAN-4 countries of Indonesia, Malaysia, the Philippines, and Thailand plus parts of South Asia, is in reconciling their concerns to minimize the adjustment costs to the rural sector of

coping with low cereal prices, to keep their budgetary costs under control, and all the while to be sure that future patterns of resource allocation are not badly distorted by the policies and investments initiated to cope with the short-run problem. In principle, the approach in the long run is to let the "pull" factors of higher incomes in the nonagricultural sector attract resources out of agriculture rather than let chronically low prices "push" farmers into urban jobs. Ultimately the process of rural diversification must be consistent with longer-run patterns of structural transformation. Arguably, the most successful countries will find ways to use the diversification process to stimulate this transformation, thus laying the groundwork for more efficient resource allocation and better income distribution.

Agricultural diversification is a much broader process than just finding new crops to grow instead of rice or wheat; it involves the entire rural economy and is a process of broadening and maintaining the sources of incomes of rural households. The process extends from the introduction of new crops into traditional farming systems to the development of off-farm jobs in small-scale rural industries and eventually to the exit of a significant proportion of the rural work force from agriculture as part of the structural transformation of the economy. At this level of generality, rural diversification is a gradual and inevitable process engendering little controversy.

The structural transformation is crucial to sustaining economic growth. Structural change is the ultimate measure of an economy's development because a society has safely managed the transition from a traditional primary-based and extractive economy to one based on technology and knowledge only when the modern industrial and service sectors make up a majority share of economic activity. Only economies based on technology and knowledge can offer sustainable improvements in welfare for a growing population.

Government policy makers in developing countries, however, are faced with a dilemma in managing this transitional process. It is shortsighted to allow farmers to be driven off their land by low prices for agricultural commodities, particularly in response to temporary price declines in world markets. Food security must be maintained and

future supplies of the basic food staple guaranteed, whether rice or wheat. Despite the changing patterns of food demand that can be expected in the process of economic development, the large countries of Asia cannot rely on the world market to meet their requirements for the basic food staple; they must grow most of it themselves. Policy makers have to find a balance among the appropriate level of incentives to farmers to grow the basic cereal, policies that encourage some farmers or some agricultural regions to diversify their production and become less dependent on production of a single commodity for their incomes, and policies that encourage resources to flow out of agriculture altogether.

The first part of this paper describes the process of structural transformation of an economy from an agriculturally based one to a modern industrial and service based economy. The second part looks at structural change in the countries of South and Southeast Asia and the Near East. From this review of the comparative experience of these developing countries, important policy issues emerge. Higher rural incomes do not automatically result from diversifying agricultural production. Many other government policies, both within the agricultural sector and outside, affect the welfare of rural workers. Some countries have ignored their agricultural sectors; others seem to be overwhelmed by the magnitude of the problems of rural poverty, population pressures, and shortages of jobs outside of agriculture. The third part addresses these policy issues in the context of likely trends facing the agricultural sector in the 1990s.

CONTENTS

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POLICY IMPLICATIONS OF DIVERSIFICATION IN ASIA AND THE NEAR EAST

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The problem arises when the process is not gradual. A pressured pace is felt when incomes to be earned from growing a specific crop or from working in the agricultural sector in general are "too low." Low incomes can be relative to prior levels of income from the activity or relative to incomes to be earned in other agricultural activities or sectors of the economy. Either way, income disparities induce resource movements, especially labor, from areas of low return to areas of high return. In the long run these resource movements are a significant contributor to efficient resource allocation and higher national income; in the short run, pressures to switch commodities or to leave farming can cause great distress if the costs of adjustment are large. To a great extent,

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1. The first draft of this paper was prepared and edited by Carol F. Timmer, drawing on our joint work over the last several years on the process of structural change in agriculture and the role of diversification in this process. The most complete discussion of structural change in this context is in C. Peter Timmer, "The Agricultural Transformation," in Hollis B. Chenery and T. N. Srinivasan, eds., Handbook of Development Economics (Amsterdam: North-Holland, 1988), pp. 275-331. The work on diversification has been partly supported by the Agriculture and Rural Development Department of the World Bank; early results are reported in C. Peter Timmer, "Crop Diversification in Rice-Based Agricultural Economies: Conceptual and Policy Issues," in Ray A. Goldberg, ed., Research in Domestic and International Agribusiness Management, vol. 8 (Greenwich, CT: JAI Press, 1988), pp. 95-163. Much of the empirical material reported here draws on Carol F. Timmer and C. Peter Timmer, "Patterns of Agricultural Diversification in Asia" (Cambridge, MA: Harvard Institute for International Development, 1988; typescript). The impact of income-generated changes in demand patterns is discussed in Rajiv Chaudhri and C. Peter Timmer, "The Impact of Changing Affluence on Diets and Demand Patterns for Agricultural Commodities," Staff Working Paper no. 785 (Washington, D.C.: World Bank, 1985).

these adjustment costs depend on the flexibility of farming systems and on the effectiveness with which rural and urban factor markets are integrated.

Incomes from farming, at least in the short run, depend on output prices, input prices, and yields. When input prices and yields are relatively inflexible, instability in farm incomes is driven primarily by instability in output prices. The emergence of crop surpluses can force output prices down sharply, thus pressuring farmers either to grow other crops or to leave the agricultural sector. Diversification becomes a problem when this process of adjustment does not happen quickly enough to bring farm incomes back into balance with previous levels or with incomes being earned in other sectors of the economy.

The response of agricultural workers to chronically depressed incomes relative to those in other sectors of the economy is to leave the agricultural sector either for jobs in urban areas or in small-scale rural industry and service jobs in rural areas. In the early stages of economic development, the share of agricultural workers in the total labor force should decline, and by the middle stage, the total number of workers in agriculture should decline. These workers are supposed to find more attractive jobs in growing industrial and service sectors. Rising real wages for unskilled labor in rural areas are an important signal that this process of structural transformation is successfully under way.

This transformation is crucial to sustaining economic growth. Structural change is the ultimate measure of an economy's development because a society has safely managed the transition from a traditional primary-based and extractive economy to one based on technology and knowledge only when the modern industrial and service sectors make up a majority share of economic activity. Only economies based on technology and knowledge can offer sustainable improvements in welfare for a growing population.

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to temporary price declines in world markets. Food security must be maintained and future supplies of the basic food staple guaranteed, whether rice or wheat. Despite the changing patterns of food demand that can be expected in the process of economic development, the large countries of Asia cannot rely on the world market to meet their requirements for the basic food staple; they must grow most of it themselves. Policy makers have to find a balance among the appropriate level of incentives to farmers to grow the basic cereal, policies that encourage some farmers or some agricultural regions to diversify their production and become less dependent on production of a single commodity for their incomes, and policies that encourage resources to flow out of agriculture altogether.

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The Structural Transformation

All countries are striving for a successful structural transformation--the gradual evolution of an economy from one based primarily on agriculture to one in which the large majority of labor and output is in the industrial and service sectors. This evolution in the role of agriculture has been a remarkably uniform process when viewed from outside the agricultural sector itself. The share of agriculture in a country's labor force and total output declines in both cross-section and time series samples as incomes per capita increase. The declining importance of agriculture is uniform and pervasive, a tendency obviously driven by powerful forces inherent in the development process, whether in socialist or capitalist countries, Asian, Latin American, or African, currently developed or still poor.

A second uniform and pervasive aspect of the development process also involves agriculture--the apparent requirement that rapid agricultural growth accompany or precede general economic growth. The logic of the classical model of economic growth requires it:

> Now if the capitalist sector produces no food, its expansion increases the demand for food, raises the price of food in terms of capitalist products, and so reduces profits. This is one of the senses in which industrialization is dependent upon agricultural improvement; it is not profitable to produce a growing volume of manufactures unless agricultural production is growing simultaneously. This is also why industrial and agrarian revolutions *always* go together, and why economies in which agriculture is stagnant do not show industrial development.[2]

The historical record to which Lewis alludes supports the strong link between agricultural and industrial growth, at least in market-oriented economies. Nor is this importance restricted to the lessons from the currently developed countries. The statistical link between agricultural and overall economic growth in currently less-developed countries has been well documented; with the exception of some mineral- or

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2. W. Arthur Lewis, "Economic Development with Unlimited Supplies of Labor", Manchester School of Economic and Social Studies, 22, 1954, p. 433, emphasis added.

oil-based economies such as Morocco and Algeria, more than two-thirds of developing countries whose agricultural growth in the 1970s exceeded 3 percent a year achieved growth in GDP of more than 5 percent a year.

> The parallels between agricultural and GDP growth suggest that the factors which affect agricultural performance may be linked to economy-wide social and economic policies. . . . Expanding agricultural production through technological change and trade creates important demands for the outputs of other sectors, notably fertilizer, transportation, commercial services, and construction. At the same time, agricultural households are often the basic market for a wide range of consumer goods that loom large in the early stages of industrial development--textiles and clothing, processed foods, kerosene and vegetable oils, aluminum holloware, radios, bicycles, and construction materials for home improvements.[3]

The need for rapid agricultural growth and for the decline in the agricultural sector's share of output and the labor force are not contradictory, of course, but the apparent paradox gave rise to a widespread misperception that agriculture is unimportant--that it does not require resources or a favorable policy environment--*because* its relative share of the economy declines.

So long as market forces provide the primary direction to the sectoral allocation of resources, how analysts perceive this process is irrelevant to the process itself. When government planners intercede, however, they do so within a framework of objectives and constraints, and this framework is ultimately conditioned by the prevailing academic understanding of how economic growth proceeds. The mainstream paradigm of the 1950s suggested that agriculture could and should be squeezed on behalf of the more dynamic sectors of the economy. This strategy could be successful if agriculture was already growing rapidly (as in Western Europe and Japan) or if it started with a large surplus relative to the subsistence needs of the rural population (as in the U. S. S. R.). But if the agricultural sector started with traditional technology and yields and living standards near subsistence, the "squeeze agriculture" paradigm created economic stagnation, not growth. In those cases, major attention was needed to induce an agricultural transformation if the industrial revolution was to have any real hope of success.

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3. World Bank, World Development Report, 1982, (Oxford University Press, New York), pp. 44-45.

Upon closer examination, it is not paradoxical that agricultural growth leads to agricultural decline. At least two mechanisms, now relatively well understood and documented, account for this process of structural transformation. Engel's Law alone, in a closed economy with constant prices, explains a declining share for agriculture (and low farm incomes unless some farmers leave agriculture) no matter how fast the sector grows. Because growth is led by demand patterns in market economies, a less-than-unitary income elasticity for the products of the agricultural sector guarantees that gross value of sales by farmers will grow less rapidly than gross domestic product. As Lewis implies in the previous quotation, if agricultural output fails to grow rapidly enough, rising prices might actually garner farmers a higher share of consumers' expenditures. But this reflects *lower* real incomes for the society as a whole, not economic growth.

If the terms of trade are not to rise in favor of agriculture, farm productivity must rise--an agricultural revolution is needed. The second factor that explains the joint agricultural growth and relative decline is seen in the rapid growth in agricultural productivity, measured by output per laborer or output per hectare, in all the successfully developed countries. Technical change in agriculture in all of the OECD countries proceeded at such a pace that the long-run terms of trade declined for farm products. Lower prices thus exacerbated the sluggish demand growth due to low income elasticities; the combination put pressure on agricultural resources to move out of farming and into the more rapidly growing sectors of the economy. Such intersectoral movements of resources have been painful in all societies that have undergone successful structural transformation, and all societies have found mechanisms to cushion the adjustment process.

The paradox over the agricultural transformation occurs at this point. Just as countries learn how to institutionalize the process of rapid technical change in agriculture, its product no longer has high social value. The resulting low incomes for farmers create powerful political pressures to slow the process of structural change, and the seemingly inevitable result is massive distortion of the price structure. Nearly all rich

countries protect their agricultural sectors from international competition, and countries no farther along in the development process than Malaysia, Indonesia, Zimbabwe, and Mexico protect key food-producing sectors during periods of depressed world prices.

Historically, all industrial revolutions have been accompanied by rising productivity in agriculture. This gain in productivity generates the resources that then stimulate expansion of other sectors. Managing this transformation is obviously a delicate process: if agriculture receives too much stimulation, the surplus resources will try to stay in the sector; if it is taxed too heavily, the surplus resources will not be generated at all.

Evolving Stages

From both historical and contemporary cross-section perspectives, the agricultural transformation seems to evolve through at least four phases that are roughly definable. The process starts when agricultural productivity per worker rises. This increased productivity creates a surplus, which in the second phase can be tapped directly, through taxation and factor flows, or indirectly, through government intervention into the rural-urban terms of trade. This surplus can be utilized to develop the nonagricultural sector, and this phase has been the focus of most dual-economy models of development. For resources to flow out of agriculture, rural factor and product markets must become better integrated with those in the rest of the economy. The progressive integration of the agricultural sector into the macro economy, via improved infrastructure and market-equilibrium linkages, represents a third phase in agricultural development. When this phase is successful, the fourth phase is barely noticeable; the role of agriculture in industrialized economies is little different from the role of the steel, housing, or insurance sectors. But when the integration is not successfully accomplished--and most countries have found it extremely difficult for political reasons--governments encounter serious problems of resource allocation and even problems beyond their borders because of pervasive attempts by high-income countries to protect their farmers from foreign competition. Managing agricultural protection and its impact on world commodity

markets thus provides a continuing focus for agricultural policy makers even when the agricultural transformation is "complete."

The four phases in the agricultural transformation call for different policy approaches. In the earliest stage of development the concern must be for "getting agriculture moving," to use Arthur Mosher's vivid phrase. A significant share of a country's investable resources may well be extracted from agriculture at this stage, but this is because the rest of the economy is so small. Direct or indirect taxation of agriculture is the only significant source of government revenue.

Building a dynamic agriculture requires that some of these resources be devoted to the agricultural sector itself. These resources need to be allocated to public investment in research and infrastructure as well as to favorable price incentives to farmers to adopt new technology as it becomes available. As these investments *in* agriculture begin to pay off, the second phase emerges in which the agricultural sector becomes a key contributor to the overall growth process.

As the empirical literature on structural patterns of growth emphasizes, there is a substantial disequilibrium between agriculture and industry at this early stage of the development process. Indeed, differences in labor productivity and measured income (as opposed to psychic income) between the rural and urban sectors persist to the present in rich countries, although the gap is narrowing and now depends on agricultural prices for any given year.[4]

The process of narrowing the gap gives rise to the third environment for agriculture, in which it is integrated into the rest of the economy through the development of more efficient labor and credit markets that link the urban and rural economies. This

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4. The structural rigidities in the economy that give rise to this substantial disequilibrium obviously mean that neoclassical models based solely on perfect markets and rational actors will fail to predict accurately the impact of government interventions. However, purely structural models that assume an absence of market response might be equally far from the mark. A messy amalgam of structural rigidities, imperfect markets, and decision makers interested in their own, but vaguely defined, welfare seems to characterize the actual starting point from which government interventions must be evaluated.

integration is a component of the contribution process; the improved functioning of factor markets merely speeds the process of extracting labor and capital from those uses in agriculture with low returns for those in industry or services with higher productivity. The improved markets have welfare consequences as well, because they lessen the burden on individuals trapped in low-income occupations. The gain has costs, however. As agriculture is integrated into the macro economy, it becomes much more vulnerable to fluctuations in macro prices and level of aggregate activity and trade and much less susceptible to management by traditional instruments for the agricultural sector, such as extension activities and specific programs for commodity development and marketing.

This vulnerability and complexity create the fourth phase in the agricultural transformation, the treatment of agriculture in industrialized economies. As the share of the labor force in agriculture falls below about 20 percent and the share of food expenditures in urban household budgets drops to about 30 percent, low-cost food is not as important to the overall economy nor is it as expensive in relative terms to increase in price. A host of political problems arise if low farm incomes, induced by rapid technical change and low farm-gate prices, are allowed to push resources out of agriculture rapidly. Farmers do not want to leave, especially if they must sell their farms under duress at low prices; and urban-based unions do not want to see them coming to the cities in search of industrial jobs. A nostalgic memory of farming as a "way of life" leads many second- and third-generation farm migrants living in cities to lend political support to higher incomes for agriculture, even at the expense of higher grocery bills (which may be barely noticeable). By this stage of the process, the share of the farm-gate price of the commodity in the consumer's market basket is small because of processing and marketing costs. Commodity price supports become the primary vehicle for supporting farm incomes, and the subsidies have devastating effects on resource allocation. Farmers invest heavily in land and machinery when farm prices are high, only to produce surpluses that are impossible to sell profitably without government supports. Eventually, the budgetary and distortionary costs of this approach become so high that even the European

Community, Japan, and the United States must face choices over how to rationalize agricultural returns with their social profitability.

The economic environments for agriculture created by these four phases are characterized by financial and labor resource flows to or from agriculture over time.[5] As agricultural productivity begins to rise, labor and financial flows to the rest of the economy increase. As the absolute population in agriculture starts to decline, the agricultural labor force drops to a fairly small proportion of the overall labor force. Whether financial resources continue to flow out of agriculture at this stage in the process depends almost entirely on government price policy and its resulting impact on farm investment. Policies to cushion the impact on farmers of successful structural change need not inevitably rely on price interventions that impede the adjustment process, but price supports have been the most popular in the United States, Western Europe, and Japan for plausible political reasons.

The Current Dilemma Facing Developing Countries

In the mid-1980s, the rice-based and wheat-based economies of Asia and the Near East began to face the problem of widespread surpluses, which forced down rice and wheat prices in domestic and international markets. The resulting low incomes for farmers who were not protected from price declines caused these farmers to search for alternatives to rice or wheat cultivation. Countries that kept domestic prices above the low prices in the world market often faced large budgetary costs, and these governments sought to diversify their farmers out of the basic food staple. Donor agencies, especially the World Bank and the Asian Development Bank, found their agricultural portfolios heavily invested in rice-specific irrigation systems, with very low economic returns being

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5. It is important to distinguish subsectors within agriculture. An export-crop subsector producing rubber or coffee might continue to provide financial resources to the rest of the economy, some of which could be returned to the foodcrop subsector in order to foster its development. As the foodcrop subsector is modernized, attention then turns to higher-value crops and livestock products as the sector becomes more diversified in line with changing patterns of consumer demand.

generated when evaluated at world prices. Rural diversification thus became a vehicle for alleviating the distress caused at three levels--farmers, governments, and donors--by the collapse of world wheat and rice prices under the pressure of large supplies in the mid-1980s.

Designing and implementing new policies and investment strategies to foster rural diversification turned out to be a complicated undertaking, however. Two major trade-offs surfaced very quickly as governments attempted to respond to the "crisis of success." First, a concern for income distribution--farm incomes were already lower than urban incomes--conflicted fairly directly with efficiency considerations, at least in the short run, and governments found it difficult to choose one or the other or an appropriate balance of the two. Attempts to have more of both created a second important trade-off, between incurring large budgetary costs to stabilize rice or wheat prices and passing on the costs to consumers. The dilemma for these countries, especially the ASEAN-4 countries of Indonesia, Malaysia, the Philippines, and Thailand plus parts of South Asia, is in reconciling their concerns to minimize the adjustment costs to the rural sector of coping with low cereal prices, to keep their budgetary costs under control, and all the while to be sure that future patterns of resource allocation are not badly distorted by the policies and investments initiated to cope with the short-run problem. In principle, the approach in the long run is to let the "pull" factors of higher incomes in the nonagricultural sector attract resources out of agriculture rather than let chronically low prices "push" farmers into urban jobs. Ultimately the process of rural diversification must be consistent with longer-run patterns of structural transformation. Arguably, the most successful countries will find ways to use the diversification process to stimulate this transformation, thus laying the groundwork for more efficient resource allocation and better income distribution.

Rural Diversification in Countries of Asia and the Near East

Since the mid-1960s, the performance of the agricultural sector has been impressive in the countries of Asia and the Near East, particularly in response to the massive resources poured into expanding rice and wheat production. By the mid-1980s, expansion of cereal production was all too successful, even exceeding goals for self-sufficiency in several countries. Surpluses found few buyers in world markets, and governments were faced with high storage costs and the prospect of plummeting incomes for farmers if price-support programs proved too costly to the government budget.

It was the growth in rice production, and also in wheat production in South Asia, that fueled growth in the agricultural sector and contributed to general rising prosperity in rural areas. The impressive agricultural performance of the Asian developing countries since the early 1970s in the face of many difficulties must in no small measure be attributed to government policies based on a recognition that the economic fate of their countries depended on the agricultural sector. The policies pursued by these countries have generally had similar objectives, but the main one was increased food production. Governments wanted increased food security through self-sufficiency in staple food production. Apart from its political and social justifications, the objective of self-sufficiency in food production has a sound economic rationale in those countries that produce their staple foods at lower cost to the economy than the average cost of imports. A secondary objective of agricultural development was the promotion of export-oriented commodity crops, primarily agricultural raw materials.

The ultimate objective of any agricultural sector, however, is to produce incomes for those employed in the sector that are comparable to opportunities in other sectors or activities. The link between agricultural diversification and longer-run structural change occurs mostly because diversification is a bridge between the declining income-earning opportunities from growing food staples and the exit from agriculture altogether. Slow growth of employment in modern industry in most countries places a heavy burden on

agriculture (and a labor-intensive residual service sector) to create jobs at a pace that matches the rate of new entrants to the labor force. These jobs are unlikely to be in cereal-growing.

The countries of Southeast and South Asia and the Near East vary widely in the success with which they have stimulated growth of per capita incomes in their agricultural sectors. Not surprisingly, in none of the countries are incomes in the agricultural sector as high as those in the nonagricultural sector. As Table 1 shows, the share of agriculture in GDP is always less, often sharply less, than the share of the labor force in agriculture, which implies that labor productivity and incomes are lower on average than in nonagriculture. But some countries have done much better than others in maintaining parity of growth rates in per capita incomes between the two sectors. Surprisingly, the degree of agricultural diversification is *not* a significant explanatory factor in the growth of agricultural incomes. More important is growth in the rest of the economy--the degree of structural change taking place--and the extent to which the agricultural sector is protected from the declining comparative advantage that comes from such structural change. Some very interesting lessons can be learned by comparing these patterns across the region.

The Southeast Asian Experience

The results of the diversification policies (or nonpolicies) pursued since the mid-1960s by Thailand shed some light on the complexity of trying to achieve both goals of diversifying agricultural production and raising rural incomes. Protection of farmers has never been a significant element of Thai agricultural policy. Domestic rice prices have been stabilized through the rice premium and other controls on exports, but the beneficiaries have been Thai consumers, not farmers. Other commodity prices have been transmitted fairly neutrally into the domestic economy from world markets, and Thai farmers have been among the most responsive anywhere in the world. Thai agricultural exports have become sharply diversified since 1965. Farmers have found crop after crop

Table 1. Basic Economic Structure of Representative Countries in Asia and the Near East

Region / Country	Share of Agriculture in Labor Force			Share of Agriculture in GDP				Per Capita GDP, 1985 (U.S. dollars per year)	
	1960	1970	1980	1960	1970	1980	1985	Average	Agricultural
Southeast Asia									
Malaysia	63	54	42	37	32	24	21[a]	2,000	1,000
Thailand	84	80	71	40	28	25	17	800	192
Philippines	61	55	52	26	28	23	27	580	302
Indonesia	75	66	57	54	47	26	24	530	223
South Asia									
Pakistan	61	59	55	46	37	31	25	380	173
Sri Lanka	56	55	53	38	34	28	27	380	194
India	74	73	70	50	47	37	31	270	120
Bangladesh	87	86	75	61	59	54	50	150	100
Near East									
Tunisia	57	50	35	24	19	17	17	1,190	578
Turkey	79	68	58	41	30	23	19	1,080	356
Egypt	58	54	46	30	29	23	20	610	265
Morocco	63	57	46	23	21	18	18	560	219

[a]1983.

Sources: Data from World Bank, *World Development Report, 1987* (New York: Oxford University Press for the World Bank, 1987) and World Bank, *World Tables*, Second Edition, 1980 (Baltimore: Johns Hopkins University Press for the World Bank, 1980).

to adopt as markets opened up. Corn, cassava, and rubber compete with rice as the leading farm export, and broilers, shrimp, orchids, and processed fruits and vegetables are gaining. With surplus land, good roads, an aggressive private marketing system, and flexible farmers, crop diversification in Thailand has been successful--with little direct government intervention.

Diversification has not, however, been a solution to the problem of low farm incomes in Thailand. The low world price for rice in the mid-1980s caused major distress for Thai rice farmers. Although the aggregate pattern of Thai agricultural production has been broadly diversified, individual farmers tend to specialize in a single crop. Such specialization has adverse consequences for income distribution when prices of different commodities rise and fall. If a major force inducing Thai farmers to diversify was sheer poverty, the success of the market-induced aggregate change in production patterns may hold little allure for other countries.

According to World Bank statistics, among the ASEAN-4 countries Thailand was second to Malaysia in average per capita income in 1985, well ahead of the Philippines and Indonesia (see Table 2). In 1965, Thailand and the Philippines had identical per capita incomes, and both were well behind Malaysia and well ahead of Indonesia. The structure of production in the two years roughly corroborates these overall economic rankings; the poorer countries have higher shares of GDP from agriculture, and vice versa. The pattern is similar, but even rougher, for the share of labor force in agriculture. The disparities between the two shares can be used to reveal some striking patterns of rural poverty and relative growth rates in agricultural incomes.

In all four countries for both time periods, the share of the labor force in agriculture is substantially higher than the share of GDP generated by agriculture, thus indicating that rural labor productivity (and almost certainly per capita incomes) is lower than labor productivity in the rest of the economy. The differences are not uniform across countries, however, and the pattern has changed dramatically over time. In 1965, Malaysia, Thailand, and the Philippines had ratios that ranged from 0.43 to 0.47, implying

Table 2. Relative Shares of Agriculture and Changes in Agricultural Incomes in Southeast Asia, 1965-1985

Row	Item	Malaysia		Thailand		Philippines		Indonesia	
		1965	1985	1965	1985	1965	1985	1965	1985
1	Per capita income (1985 U.S. dollars)	845	2,000	365	800	365	580	208	530
2	Average annual change, 1965-1985 (percent)		4.4		4.0		2.3		4.8
3	Share of labor force in agriculture[a] (percent)	59	42	82	71	58	52	71	57
4	Share of agriculture in GDP, current prices (percent)	28	21[b]	35	17	26	27	56	24
5	Share in labor force minus share in GDP[c] (percent)	31	21	47	54	32	25	15	33
6	Ratio of share in GDP to share in labor force[d]	0.47	0.50	0.43	0.24	0.45	0.52	0.79	0.42
7	Implied per capita income in agriculture[e] (1985 U.S. dollars)	397	1,000	157	192	164	302	164	223
8	Average annual change in per capita agricultural income, 1965-1985 (percent)		4.7		1.0		3.1		1.5

[a] Data for labor force are for 1980 instead of 1985.
[b] Data for 1983.
[c] Row 3 minus Row 4.
[d] Row 4 divided by Row 3.
[e] Assumes all GDP generated in agriculture accrues to the agricultural labor force. Calculated as Row 6 times Row 1.

Source: Carol F. Timmer and C. Peter Timmer, "Patterns of Agricultural Diversification in Asia" (Cambridge, MA: Harvard Institute for International Development, 1988; typescript).

that agricultural workers were approximately 45 per cent as productive as non-agricultural workers. The ratio for Indonesia was 0.79, which reflected a much more equal distribution of income in a far more primitive economy at the time.

The most interesting statistics are the implied per capita incomes for the rural populations in each country. Even in 1965 Malaysia was well out in front; its per capita rural income was more than double the level of any other country in the ASEAN-4. Rural incomes in the other three countries were roughly equal, probably approximating a near-subsistence standard of living. Individuals substantially below the indicated averages were likely to be highly vulnerable to disease or hunger. By 1985, all countries had made progress in improving rural productivity, but the changes were very unequal. The implied growth rate in rural per capita incomes in Malaysia exceeded that of average national per capita incomes. This rapid rate of growth in rural incomes reflects a remarkably successful effort to channel resources to the agricultural economy. The Philippines also had a higher rate of growth in rural incomes than non-rural ones, although this seems to reflect an inefficient allocation of resources in a protected industrial sector rather than striking success in agriculture. Indonesia's growth in rural incomes was modest, surprising in view of the rapid growth in agricultural output during this time period but not surprising in view of the deteriorating terms of trade for agriculture that accompanied the "Dutch Disease" side effects of the boom in oil prices.

In Thailand, rural incomes rose only 1.0 per cent per year over this period from a level already slightly below those of Indonesia and the Philippines in 1965. Despite the significant diversification into new export markets by 1985, Thailand's farmers lagged even further behind their comrades in the rest of ASEAN, with Malaysian per capita farm income levels five times higher, the Philippines fifty per cent higher, and even Indonesian levels one-sixth higher. Thailand's success with crop diversification was not matched by rising real incomes in rural areas. Two factors may account for this result: exposure to low world commodity prices in the mid-1980s; and the slow increase in the industrial work force, an outcome of the capital-intensive industrialization effort which

left so many workers in agriculture. Malaysia and the Philippines have been more successful in raising rural incomes but somewhat less successful in diversifying agricultural output. Indonesia has been less successful at both, although its rice farmers were relatively well protected from low prices in world markets in the mid-1980s.

Experience of South Asia

The patterns of agricultural shares and income growth in South Asia contrast sharply with those in the ASEAN-4 countries. Table 3 shows parallel data for Pakistan, Sri Lanka, India, and Bangladesh. Overall growth in per capita income from 1965 to 1985 is much lower on average--only Pakistan and Sri Lanka have rates as high as the lowest rate, for the Philippines, in the ASEAN-4 countries. Per capita incomes are much lower in South Asia, with the highest averages--in Pakistan and Sri Lanka--only 70 percent of Indonesia's level, the lowest in the ASEAN-4. The structure of the South Asian economies largely reflects this poverty. Agriculture contributes a larger share of GDP in all South Asian countries than in any of the ASEAN-4, with the exception that Pakistan and Sri Lanka are roughly equivalent to the Philippines. An important similarity, however, is in the agricultural share of the labor force. Only Malaysia has a level significantly below the shares in South Asia. The share in Thailand is roughly equal to those in India and Bangladesh; the labor force shares in the Philippines and Indonesia are comparable to those in Pakistan and Sri Lanka.

The ratios of agricultural labor-force shares to GDP shares reflect these contrasting patterns. The 1965 ratios were high relative to all countries in the ASEAN-4 sample, except for Indonesia, which was as poor as Sri Lanka and Pakistan at the time. The ratio changed little in Bangladesh in 20 years, mostly because the overall economy remained so stagnant. Any further deterioration in rural standards of living would no doubt have caused death rates to rise sharply. Even by 1985 the implied level of per capita incomes in the agricultural sector remained below the lowest levels in other countries in 1965. The

Table 3. Relative Shares of Agriculture and Changes in Agricultural Incomes in South Asia, 1965-1985

Row	Item	Pakistan		Sri Lanka		India		Bangladesh	
		1965	1985	1965	1985	1965	1985	1965	1985
1	Per capita income (1985 U.S. dollars)	227	380	211	380	193	270	138	150
2	Average annual change, 1965-1985 (percent)		2.6		2.9		1.7		0.4
3	Share of labor force in agriculture (percent)	60	55	56	53	73	70	84	75
4	Share of agriculture in GDP, current prices (percent)	40	25	28	27	47	31	53	50
5	Share in labor force minus share in GDP[a] (percent)	20	30	28	26	26	39	31	25
6	Ratio of share in GDP to share in labor force[b]	0.67	0.45	0.50	0.51	0.64	0.44	0.63	0.67
7	Implied per capita income in agriculture[c] (1985 U.S. dollars)	151	173	106	194	123	120	87	100
8	Average annual change in per capita agricultural income, 1965-1985 (percent)		0.7		3.1		-0.1		0.7

[a] Row 3 minus Row 4.
[b] Row 4 divided by Row 3.
[c] Assumes all GDP generated in agriculture accrues to the agricultural labor force. Calculated as Row 6 times Row 1.

Source: Carol F. Timmer and C. Peter Timmer, "Patterns of Agricultural Diversification in Asia" (Cambridge, MA: Harvard Institute for International Development, 1988; typescript).

rural-urban distribution of income in Bangladesh reflects this extreme poverty, being more equal than in any other country in the sample.

In Pakistan, the distribution of income deteriorated between 1965 and 1985, as overall economic growth raised average per capita incomes by 2.6 percent per year. Consequently, rural per capita incomes increased only 0.7 percent per year, the same as in Bangladesh. The higher starting point, however, meant the absolute gains in Pakistan were nearly double those in Bangladesh, and the 1985 level was higher than the 1965 levels in Thailand, the Philippines, and Indonesia. Indeed, Pakistan in 1985 looks statistically much like those three countries in 1965.

Sri Lanka presents yet another contrast. It had the fastest growth in the region during the twenty-year period, reaching parity with Pakistan in per capita incomes by 1985. Moreover, it did this with no deterioration in the rural-urban income distribution, with the ratio of agricultural labor share to GDP share actually rising from 0.50 in 1965 to 0.51 in 1985. Accordingly, agricultural incomes rose 3.1 percent per year during the period, faster than all countries in Asia except Malaysia (and equal to the Philippines), reflecting the important role of agriculture in the recovery and the switch to an export orientation of the Sri Lankan economy after 1978. In many ways Sri Lanka in 1985 looks more like the bottom of the ASEAN-4 in 1985 than like the other countries in South Asia. Its switch to a more open economy, stress on agricultural growth and diversification, and private marketing activities may explain the emergence of Sri Lanka into a faster pattern of structural change.

The most puzzling pattern of all is the decline in agricultural per capita incomes in India from 1965 to 1985. The decline is caused by the sharp decline in the ratio of agricultural labor share to GDP share, from 0.64 in 1965 to only 0.44 in 1985. The drop is not as large as that in Indonesia--from 0.79 to 0.42--but overall per capita incomes in Indonesia grew 4.8 percent during the period compared with only 1.7 percent in India. No oil-export boom accounts for a deteriorating rural-urban terms of trade as in Indonesia. A relatively closed economy with high industrial protection, poor integration of rural and

urban labor markets, little structural change in demand patterns because of slow growth in income, and consequently no demand stimulus to agriculture from the rest of the economy are likely to be the main factors accounting for this poor record of economic growth. Despite the great success in reaching self-sufficiency in staple grains in India during this period, the high prices used to induce growth prevented diversification into other crops. In the absence of significant demand stimulus for foods with high value added and more diversity, India's agricultural economy on average was even more moribund than the rest of the economy.

South Asia presents startlingly different patterns of agricultural change than those of Southeast Asia, at least as represented by the ASEAN-4 countries. No strong lessons emerge yet, however. Strong aggregate growth sometimes stimulates agricultural growth, as in Malaysia and Sri Lanka. But experience in Pakistan, Thailand, and Indonesia demonstrates that agriculture can have a hard time competing in the face of rapid structural change if price policies or macroeconomic policies are not supportive. Very slow growth in the macro economy seems to spell trouble for agriculture as well; the absolute poverty in India and Bangladesh where such a pattern was seen in Table 3 may be as much to blame as poor agricultural policies. The four countries in the Near East examined in the next section add useful perspective to these issues because all four had reasonably dynamic economies under the stimulus of the Middle Eastern oil boom.

Experience of the Near East

Table 4 shows parallel data for four countries in the Near East--Algeria, Tunisia, Egypt, and Morocco. The spread in per capita incomes in 1985 was similar to those in the ASEAN-4 countries, from a low of $560 in Morocco to a high of $2550 in Algeria. The Near Eastern countries started the period about 40 percent better off than the Southeast Asian countries and ended only about 25 percent better off, reflecting the superior growth performance in the ASEAN-4 countries. Still, the lowest growth rate, 2.2 percent for

Table 4. Relative Shares of Agriculture and Changes in Agricultural Incomes in The Near East, 1965-1985

Row	Item	Tunisia		Turkey		Egypt		Morocco	
		1965	1985	1965	1985	1965	1985	1965	1985
1	Per capita income (1985 U.S. dollars)	543	1,190	646	1,080	331	610	362	560
2	Average annual change, 1965-1985 (percent)		4.0		2.6		3.1		2.2
3	Share of labor force in agriculture (percent)	49	35	75	58	55	46	61	46
4	Share of agriculture in GDP, current prices (percent)	22	17	34	19	29	20	23	18
5	Share in labor force minus share in GDP[a] (percent)	27	18	41	39	26	26	38	28
6	Ratio of share in GDP to share in labor force[b]	0.45	0.49	0.45	0.33	0.53	0.43	0.38	0.39
7	Implied per capita income in agriculture[c] (1985 U.S. dollars)	244	578	291	356	175	265	136	219
8	Average annual change in per capita agricultural income, 1965-1985 (percent)		4.4		1.0		2.1		2.4

[a] Row 3 minus Row 4.
[b] Row 4 divided by Row 3.
[c] Assumes all GDP generated in agriculture accrues to the agricultural labor force. Calculated as Row 6 times Row 1.

Morocco, would be a respectable performance for South Asia, and the other three countries had rates of growth in per capita income between 3.1 and 4.0 percent.

More striking is the significantly greater structural change apparent in the Near East economies. None has more than 20 percent of GDP from agriculture, compared with a low of 25 percent in South Asia and 17 percent in Southeast Asia (in Thailand, an artificially low figure due to low world commodity prices in 1985). Perhaps more importantly, the good performance in growth in the overall economy did not lead to a deterioration in rural-urban income distribution. Only in Egypt did the ratio of agricultural share in the labor force to GDP share decline; in the other three countries it remained constant or increased. Accordingly, per capita incomes in the agricultural sector as measured by the methodology used here showed very respectable growth, from a low of 2.1 percent per year in Egypt to 4.4 percent in Tunisia.

The agricultural economies of these four countries in the Near East diversified significantly during this period, as comparative advantage in cereal growing declined, and access to markets in the oil-exporting countries of the Middle East and to winter markets in Europe stimulated exports of fruits and vegetables. Patterns of domestic demand began to evolve rapidly as well under the impetus of higher urban incomes resulting from oil revenues or foreign remittances. Some of these revenues also fueled increases in prices of good agricultural land, especially close to cities, and the higher land values further increased pressures to find higher-value crops. In these circumstances, dynamic urban economies and strong export markets stimulated diversification away from wheat cultivation, and agricultural incomes rose in step with incomes outside the sector. To accomplish this parity, however, large numbers of agricultural workers had to migrate, and the share of agricultural workers in the total work force declined sharply, from 49 to 35 percent in Tunisia, from 75 to 58 percent in Turkey, from 55 to 46 percent in Egypt, and from 61 to 46 percent in Morocco. The number of workers in agriculture actually declined in Tunisia and barely increased in Turkey, which reflects a major turning point in the structural transformation of agriculture. No country in Southeast or South Asia

has reached this point--not even Malaysia, where the agricultural labor force continues to increase about 1.0 percent per year.

A review of the experience in countries of Asia and the Near East suggests that diversification is more a result of structural change, trade orientation, and export opportunities than of conscious government policies. To stimulate diversification, agricultural policy makers must integrate policies that increase flexibility in production with those that maintain farm incomes. In resolving the problems of such policy coordination, policy makers must juggle all the complexities of finding optimal budgetary allocations for agricultural research and investment as well as pricing policies and marketing structures that provide adequate agricultural incomes from production of cereals and yet offer incentives to diversify. No country seems to have managed all dimensions of this task consistently well, and the trade-offs in approach are quite apparent. What the market gives in efficiency, it can take in incomes; what the government can provide in incomes, it can easily lose in poor resource allocations.

Policy Issues for the 1990s

By the 1980s it was apparent that most Asian countries knew how to stimulate their farmers to grow enough wheat or rice to meet domestic goals for food security (which was sometimes, but not always, interpreted to mean self-sufficiency). With the real value of these commodities in world markets at low levels, the economic value of this achievement, especially at the margin, was questionable. Where, then, should governments put their resources? Since the mid-1960s, they went mainly into food production, especially rice and wheat, but production successes alone did not solve the problem of food consumption nor will they raise farm incomes in the future if prices remain low. Other policies that address farm incomes--access to non-cereal markets and off-farm employment--will be needed, and for these, broader diversification policies will play an important role. What is clear is that production of rice and wheat can no longer fuel widespread growth in the

agricultural sector. There will remain a need for sufficient grain for food security, and for large Asian countries this means growing most of it domestically. But policies that generate these grain supplies need also to be consistent with the longer-run process of shifting out of grain production specifically, and out of agriculture more generally, as part of the structural transformation.

Many countries, especially in Latin America and Africa, have found it difficult to strike the right balance between support for primary food grains such as wheat and rice, secondary foodstuffs such as starchy staples with low or negative income elasticities, higher-value pulses, vegetables, fruits, and livestock products, and crops destined specifically for export. Allowing the market to be the sole determinant of this mix runs the risk of undervaluing foods for the poor and food security in general, whereas high-income consumers and export markets are well served. Concentrating too much on basic foods, however, can lead to rigid production systems that are unable to adjust rapidly to surpluses and discrimination against earning foreign exchange.

Most Asian countries have done reasonably well in striking this balance. They have stressed domestic food security through developing their rice or wheat sectors intensively and earning foreign exchange from tree crops and other commodities, which have relatively little interaction with the cereal economy. The problem with this strategy emerged only in the mid-1980s, and then only as a problem of success. There was too much rice and wheat, at least temporarily. The surpluses did, however, reveal a gap in most agricultural development strategies: a neglect of the "intermediate" agricultural sector that is neither basic food staple nor traditional export crop. The important policy question is whether diversification into this intermediate sector from both the rice or wheat sector and the more traditional export-crop sector is technically and economically feasible. Experience with this process varies, both with respect to individual commodities and with respect to countries.

The Approach to Policy Design

By the very nature of agricultural production in South and Southeast Asia and the Near East, most of the adoption of diversified cropping patterns will be by millions of small-scale farmers acting in accord with their private interests. State-owned plantations can be diversified by command, and public exhortations to farmers to switch out of rice or wheat might induce some response. But by and large, at the level of adoption, diversification is an activity of the private sector. At the other extreme, relatively few resources from the private sector will be invested in large-scale irrigation projects, roads, electrical and communications networks, or even agricultural research on alternative crops to rice or wheat that can be grown by smallholders. These activities fall almost entirely in the domain of the public sector, at least in the countries of concern. In between these two clearly defined domains lies the possibility of a significant hiatus with respect to implementation of crop diversification schemes.

A basic premise of current diversification efforts is that further, large increases in rice and wheat production will not find a market at remunerative prices. Unless prices actually facing farmers communicate this signal, they will try to continue expanding cereal production. If the lower prices are passed on to farmers, they will actively seek alternative crops with better market prospects or better income-earning prospects off the farm or outside of agriculture. Such changes are desirable as a long-run response but can be quite tumultuous in the short run. Poor farmers and rural landless laborers might crowd into urban labor markets seeking jobs and create unrest if they do not find them. Attempts to grow alternative crops may flounder because of untried technology or markets that are too thin to absorb profitably substantial increments in supply. Government extension workers are blamed when soybeans are wiped out by pests and disease; middlemen are blamed for falling prices for cabbages and onions. Confidence in the effectiveness of government development programs is shaken; willingness to trust the marketplace as an arena for easy and fair exchange of commodities is lost--by both

farmers and policy makers. To avoid these problems, governments are searching for alternatives to such a short-run market free-for-all.

Stimulating Growth of the Private Sector.-- The key to this search is a better understanding by public policy makers of the actual decision-making environment of private-sector participants--farmers, traders and processors, and consumers. With this understanding comes the capacity to design more sensitive and effective policies that draw on, rather than scare away, the initiative and investment resources of the private sector. Commensurate with this effort by public policy makers is a responsibility of private interests to cooperate in the development program by becoming informed about government objectives and plans. Participation in a public debate about these objectives is healthy, as is constructive criticism in response to drafts of government plans and programs. Large-scale private interests--corporations, unions, cooperatives, and consumer-interest groups--have the resources and stake to conduct their own analysis of these issues and to lay them before public policy makers. Unfortunately, important classes of citizens are left out of the policy process if it ends there. Public policy analysts have a responsibility to examine proposed policies and programs for their impact on these disenfranchised elements of society: small farmers, the rural landless, and the urban poor. Public-private cooperation should not evolve into a cozy relationship between large corporations and a handful of government officials responsible for policy making in the very arena of their corporate interests.

The issue is particularly clear in the diversification debate. If the process is to be market driven, knowledge of and access to those markets for nontraditional commodities are crucial. When the markets are external, the easiest way to gain such knowledge and access is to tap the expertise, and possibly the capital, of a multinational enterprise. With many countries now bidding for this expertise, there is a risk that more incentives will be offered, either publicly or privately, than is justifiable on the basis of benefits to the country. A certain responsibility on both sides of the bargaining table is essential to keep the process within bounds. Most countries do not have well-developed mechanisms for

conducting such a public-private interchange, and the analytical tools for understanding the process are blunt at best.

Reducing the Burden of Adjustment.-- An important lesson learned from postwar development experience is that economic growth depends on rising agricultural productivity. Economies that have invested financial, human, and policy resources in agriculture in the postwar era have grown faster than those that neglected or discriminated against their rural economies. Wherever rapid agricultural growth stimulated rapid overall economic growth, however, societies have often had to pay a heavy price for their success in the form of severe cases of structural lag. Human and financial resources have not been able to move out of the agricultural sector fast enough to prevent low economic returns to their utilization. As a result, low incomes, even widespread poverty, are seen in some rural areas. Those countries that have supported farm incomes through price supports have paid very high budgetary costs, and these burdens have been exacerbated in the 1980s by the collapse of commodity prices in world markets. Diversification of agricultural production patterns is a potential response to *both* problems--structural transformation and low commodity prices--but the relationship between the two problems is not one-to-one, nor will the potential solutions necessarily correspond.

A successful structural transformation is painful for the agricultural sector in all societies. Agriculture declines in relative importance as societies become richer; eventually agricultural labor must find work in other sectors. The process of selling the family farm and uprooting households to look for jobs in the city *is* painful, especially when the family members have few skills applicable to modern urban life. It is not surprising that societies cushion this process whenever they become rich enough to afford it. The only puzzle is why all industrial countries seem to use the same mechanism: protection of domestic farmers from foreign competition for commodities that were imported historically. This protectionism is thought to stem from the changing political "market," as food declines in importance in real wage rates and urban household budgets,

and from the capacity to "hide" support costs in higher consumer prices rather than direct budgetary outlays. Whatever the reasons, they are clearly quite powerful to account for the pervasive use of agricultural protection in industrial economies.

Despite policy efforts to slow the structural transformation and preserve the viability of family farms, the exit of agricultural labor to other sectors is inevitable and the only mechanism for coping with inexorable shifts in demand and supply conditions for agricultural output. In the long run, rural incomes will be depressed relative to urban incomes unless labor leaves agriculture. High commodity prices can temporarily slow this process, as in the mid-1970s, and low commodity prices can accelerate it, as in the mid-1980s. But all existing historical experience argues that transferring labor out of agriculture is inevitable if the economy is growing. The policy issue is whether efficient ways can be found to ease the pain of adjustment, perhaps through better educational programs in rural areas, more flexible land and credit markets so that farmers can avoid sales during hard times, and rural industrialization programs to create a better market for off-farm employment for members of farm families.

Maintaining Rural Incomes.-- To address these issues, the analysis must return to the broader topic of structural change and adjustment. Greater off-farm employment opportunities are the surest way to cope with low incomes from rice or wheat farming, even when most irrigated land continues to grow the basic cereal. Land consolidation may permit fewer farmers to continue to earn competitive incomes from rice or wheat farming even at lower prices, which has been the path of the United States and, to some extent, Western Europe. Alternatively, very small farm size might coexist with lower cereal prices if most farm household members have full- or part-time jobs in rural labor markets. Taiwan and Japan have followed a variant of this path, but the South Korean pattern is significantly different (see Table 5). Many farm household members in Taiwan and Japan work in the industrial sector, and average farm size remains minuscule by the standards of other OECD countries, partly because of stringent controls on land accumulation enacted at the time of postwar land reforms. Rice prices in all three

countries have been maintained far above those in the world market to provide added income to rice farmers, a politically powerful group, but the divergence has been widest in Japan. Poorer countries cannot afford the budget costs or the resource misallocations of the Japanese model, but they face similar pressures for adjustment and support of low farm incomes.

In the developing countries of Asia, the process of rural diversification is likely to follow a path similar to that of other Asian countries that have already undergone the agricultural transformation. Much has been learned from these countries, and the experiences of those based on a rice economy--Japan, South Korea, and Taiwan--are especially relevant to South and Southeast Asia. In particular, the role of small farm size in conditioning the path of diversification and structural change cannot be ignored. Widely dispersed small farms were a crucial factor in the adoption of high-yielding rice technology and the equitable distribution of its benefits. The pricing and marketing policies of countries that encouraged the small farmer to invest heavily in rice production, however, also gave them a strong vested interest in the continued use of price policy as an instrument for maintaining rural incomes relative to rapidly rising industrial wages. The large numbers of small farmers lent political importance to these concerns, and all successfully industrializing Asian countries have protected their rice farmers from foreign competition as they lost comparative advantage in rice production.

Policies Consistent with the Structural Transformation.-- Diversification strategies have been used in Japan, South Korea, and Taiwan to cope with the budgetary costs and inefficiencies in resource allocation that accompany protection of rice farmers. But the unique role played by rice in the agricultural economies of all these countries has been difficult to replace. The adjustment has gone more smoothly where the rural economy had important nonagricultural activities for support, as in Taiwan. This role of a dynamic *rural* economy, as opposed to a dynamic *agricultural* economy, stresses the importance of nonagricultural policies in the diversification process. In particular, policies that help integrate urban and rural labor markets and facilitate the establishment

Table 5. Share of Farm Household Income from Nonfarm Sources, 1962 and 1980

Country	Total Income from Nonfarm Sources (percent)		Wage Income[a]	
	1962	1980	1962	1980
Japan	49	80	36	69
Taiwan	34[b]	74	20[b]	52
South Korea	20	35	9	14

[a]Share of farm household income earned as wages from nonfarm sources. This share is included in the total.

[b]Figures for Taiwan are for 1966.

Source: Kym Anderson, Yujiro Hayami, and others. The Political Economy of Agricultural Protection (Sydney, London, and Boston: Allen and Unwin, 1986), p. 13.

of small-scale rural industries speed diversification *and* structural change by pulling resources out of agriculture. In most countries, however, pressures remain that exert a strong push. Part of any agenda to foster rural diversification must cope with the short-run problems generated by these pressures. The lessons from the already industrialized countries in Asia are not promising in this regard. Heavy protection of rice farmers was an essential ingredient in coping with the short-run pressures on income distribution in all three countries.

The entire society has important stakes in diversification programs when they are designed and implemented within a policy framework that incorporates the changing structure of the economy during the process of economic growth. The impact can be positive or negative. Policies that attempt to freeze the allocation of resources and distribution of incomes to farmers growing particular commodities (especially cereals) can gradually create serious distortions in the allocation of economic resources, and these distortions can imperil overall economic health unless the country is rich enough to afford them. Japan can afford to indulge rice farmers more than Malaysia or Indonesia can, although the spillover effects create serious problems for trade policy even in Japan. There are also positive adjustment policies, however, that attempt to make the agricultural system more flexible, that train agricultural workers for off-farm jobs, and that cushion the transition from a rice-based or a wheat-based agricultural economy to an industrial and service-based economy. These policies include diversification programs at the level of research, investment in infrastructure, improvement in marketing communication and information, and pricing interventions that build stable expectations and lessen the risk of adopting new technologies and products. To be successful, positive adjustment policies must be consistent across all three levels of policy concern: the farm level, the agricultural sector level, and the macroeconomic level.

Policies for the Agricultural Sector.-- Farmers make the actual decisions that lead to a more diversified agricultural economy, but agricultural policy and investments by government agencies determine the technical and economic environment in which farmers

choose. Diversification programs, in particular, are usually designed and implemented by agricultural ministries. Their primary dilemma is whether to diversify farmers or regional cropping patterns. The former approach requires flexible technologies and marketing capacity at the level of individual farmers; the latter approach allows farmers to specialize in a single crop while diversifying output and exports for the country as a whole.

Specialization is the opposite of diversification; it would seem to be part of the problem rather than part of the solution to any overemphasis on a single crop. There are two reasons why regional specialization might be a crucial feature of any diversification policy. First, agronomic and climatic factors favor some crops over others. In the relatively large and diverse countries of Asia, soil types, temperatures, and rainfall patterns can vary radically from one part of a country to another and at different altitudes in hilly or mountainous regions. Volcanic soils support intensive crop cultivation; the acidic soils underlying much of Asia's rain forests are much thinner and more difficult to manage in terms of sustained fertility. Tree crops such as rubber or oil palm probably have substantial technical advantages relative to corn or soybeans, for example, on such soils. Only if relative prices shifted sharply in favor of food crops would it make economic sense to invest in restructuring the acid soils of the humid rain forest areas to support annual cultivation of rice, corn, root crops, or legumes.

The second reason for regional specialization is more easily overlooked, but it may be as important as agronomic factors. Efficient development of entire commodity systems, from input production and marketing through to downstream processing and consumption of the final product, requires the formation of extensive backward and forward linkages from the producer level. These linkages can be both technological, depending on engineering relationships and quality requirements, for example, and financial, depending on investment patterns from profits generated by commodity production and consumption patterns from the incomes earned in the sector. Many of these linkages exhibit economies of scale and can be developed to efficient levels only if

the commodity is produced in a relatively cohesive spatial pattern. This process of market deepening is a natural result of regional specialization and one of the major forces that gradually but persistently produces such specialization. Well-developed, low-cost marketing systems require sufficient supplies of the specific commodities being marketed to justify the full investments needed to capture any economies of scale to the system. Achieving this balance is a simultaneous process. As specialized production grows in a region, the marketing system expands to serve it but also creates the demand for further expansion by offering lower marketing costs than those in regions that would otherwise be competitive on climatic and agronomic grounds. The lower costs generated by specialization can convey very significant competitive advantages on regions that are both low-cost producers of a commodity and have an efficient marketing system that has adequate volume to capture the economies of scale implicit in the forward and backward linkages.

Regional specialization in a range of agricultural products would thus seem to be the answer to the problem of diversification. Such specialization permits the cost economies of scale (and learning) to be captured, while diversifying the country's agricultural output. A problem remains, however. Although the country may be well diversified, individual farmers and regions are not. Significant price instability, whether generated strictly in domestic markets or transmitted from international markets, would have substantial income-distribution consequences for the farmers and regions concerned--unless their output is sufficiently negatively correlated with prices that net revenue is stabilized by unstable prices. When large regions depend heavily on a single crop for their economic base, the vulnerability from specialization is similar to that at the national level when rice or wheat cultivation is widespread. When rubber producers, coffee growers, or corn farmers specialize in production, each can face problems of income stabilization in the face of unstable prices or yields.

The consequences for income distribution of crop specialization at the farm or regional level are straightforward. With *domestic* price stability, small farmers can

specialize in single crops, and regional diversification can keep surpluses from developing. But this strategy depends on price stabilization. Otherwise *individual* farmers must diversify to spread risks from price fluctuations. Such diversification is likely to incur high costs because of forgone effects of "learning by doing" and the scale economies inherent in marketing systems. Compared with national specialization in a single commodity, the macroeconomic consequences of regional vulnerability are not as great--unless all prices and yields move together. But the individual and regional problems should also receive the attention of policy makers. Especially in countries with diverse regional interests, appearing to ignore the economic plight of distressed regions can have devastating consequences for the political stability of the country as a whole.

The Macro Economy and Agriculture.-- Macroeconomic policies have a significant impact on agriculture, and their effects can often overshadow those of sector-specific policies. Trade, exchange rate, fiscal, and monetary policies are leading determinants of the movement of capital and labor between agriculture and the rest of the economy, the growth and composition of agricultural output, and the volume and composition of trade in agricultural products. Macroeconomic policies thus affect diversification both within the agricultural sector and outside it.

Just as macroeconomic policy can be the dominant factor influencing agricultural development, its impact is similar on the process of rural diversification. Evolving patterns of demand are the prime driving force behind the diversification process; the speed at which these patterns shift and thus support rapid diversification is largely a function of macroeconomic performance. Links to patterns of foreign demand are efficient only if the exchange rate correctly reflects the real opportunity costs of domestic resources in producing for export. A repressed financial system always discriminates against the rural sector, and diversification efforts are highly sensitive to credit availability for private traders if flexible marketing arrangements are to be created. Rural infrastructure is mostly a public good, not supplied in optimal amounts by the private sector. Unless a government's budgetary priorities and spending procedures

support investments in and maintenance of this infrastructure, rural diversification can make little progress. It is clear that the design and implementation of rural diversification programs and policies cannot rest solely in the ministry of agriculture. Cooperation among government agencies is essential to agricultural development efforts in general; for a diversification effort, the planning agency, ministry of finance, ministry of trade, ministry of public works, and other agencies must be actively involved.

The Task at Hand

The approach taken here treats diversification as a process rather than as a result. The objective of the process in the near term is to increase the flexibility of cropping systems so that various crops can be grown with relatively small adjustment costs. The level at which such flexibility is created is crucial to the costs involved; creating flexibility for individual farmers is far more costly than creating flexibility of sectoral cropping patterns for the country as a whole. Regional specialization is possible within an overall pattern of national diversification, thus drawing on differences in agronomic potential and the economies of scale in marketing that are inherent in well-functioning commodity systems. Unfortunately, such regional specialization leaves most farmers highly vulnerable to price changes for the particular commodity they produce. Rice or wheat farmers will still have low incomes when prices of these commodities are low.

National diversification through regional specialization is the efficient route to solving the aggregate problem of vulnerability to sharp changes in individual commodity prices, but income distribution problems for farmers remain. These problems can be solved in the long run only by diversifying the sources of income for farm households, including diversification out of agriculture altogether. While consistent with patterns of structural transformation, and thus desirable as a strategic direction, moving farmers out of agriculture encounters many short-run problems. Especially in economies burdened with inefficient manufacturing sectors operating behind tariff barriers, job opportunities outside of agriculture are severely limited in the short run. One way or another, the rural

economy has to absorb most of the labor leaving the cereal-growing sector. Rural diversification is the major vehicle countries have to increase capacity to absorb this labor. The process is not restricted to finding crops that substitute directly for area sown to rice or wheat--although this is part of the answer in certain seasons and regions. The rural nonfarm sector is an increasingly important source of jobs for members of farm households, and the process of diversification has the potential to increase the role of small-scale rural industry, marketing, construction, and other labor-intensive activities.

Finding ways to cope with these short-run and long-run dimensions of rural diversification is not easy. The approaches used historically are sharply divergent--from the carefully government-directed diversification programs in Japan to the free-wheeling market approach in Thailand. Both have their problems and successes, but a common lesson is that the diversification process must be market-led in the sense of pointing farmers toward activities with better market demand and higher potential for income than rice. The important question for policy is the source of the demand. In Japan the domestic market for several non-rice commodities was reserved for diversifying rice farmers. In Thailand, world markets provided the main impetus to diversification.

There is no point in diversifying farmers out of rice or wheat into a crop for which the market potential is no better. Markets for new crops are often thin, lacking the government backing and long experience with large quantities involved with wheat and rice markets. Significant increases in output face heavy price discounts by traders who are uncertain of potential demand in wholesale markets; farmers lose money on their experiment with the new crop and revert to concentrating on rice or wheat, crops for which there is a guaranteed market.

Building competitive and responsive domestic marketing systems is the key to breaking out of this vicious circle, for three reasons: an efficient private marketing system can relieve the government of much of the burden of price-support schemes if regular exports of a commodity can be generated; lower marketing costs increase average returns to farmers by garnering them a larger share of the consumer price; and the lower

costs provide more stable prices to farmers because of smaller leverage between the f.o.b. export price and the farm-gate price.

Investments in infrastructure are needed to stimulate the development of such a marketing system. Lowered marketing costs come with better roads, communications, information, and public marketplaces. In addition, government agencies can sponsor mobile rural buying stations where growers can meet on a regular schedule with traders. Daily radio broadcasts can provide information on wholesale and rural market prices for nontraditional commodities as well as the routine staples sold by farmers. Governments can facilitate the industry's development of appropriate grades and standards to lower transaction costs, and it can provide effective institutional arrangements to make contract farming less risky for both farmer and processor.

Improved rural financial systems can broaden participation in formal credit markets, opening more opportunities for traders to receive working capital that will finance short-term investments by farmers in new crops. Improved legal procedures and institutions can facilitate a productive role for private-sector firms in seed development and distribution, fertilizer marketing, and processing for domestic and export markets. The national government is the key actor in setting all of these factors in motion.

A market-led diversification process depends on an improved technological base, even in the context of a given market environment. Research and extension activities for non-cereal crops and livestock operations can alter the technological base faced by farmers and their skills in using it. Research on design and management of irrigation systems, to make crop choices more flexible, has the potential to change the nature of constraints facing farmers. Research on crop and livestock technology is essential for any substantial progress to be made on diversifying agriculture. Rice and wheat have benefited from a disproportionate share of research funding since the 1950s. Redressing the technological balance by developing higher-yielding varieties of non-cereal crops, better-adapted livestock breeds, more cost-effective forms of disease and pest control, and improved postharvest techniques come only through sustained commitment to national and

international research programs. Scope for increased cooperation with private-sector research efforts exists, and these efforts can play a significantly larger role than in the past if governments adopt appropriate institutional arrangements to protect patent rights and make possible the development of private marketing channels for proprietary information and products. Whatever the mechanisms, an improved technological base is needed to lower the costs and improve the reliability of non-cereal crops if farmers are to benefit by diversifying out of rice or wheat.

A better understanding is needed of the synergistic and competitive dimensions of farming systems that stimulate farmers to move away from monocropped rice or wheat. This research faces two complex and related questions: how do different crops and livestock interact agronomically to determine overall output, and what are the costs of the various combinations; and how can individual farmers on small plots of land cooperate with neighbors to capture any economies of scale in crop production? Complex systems of intercrops will probably reinforce the small farm size characteristic of so much of Asia, but improved technology for individual crops such as corn or soybeans may create opportunities for significant gains in efficiency and yields to be achieved from coordinated plantings, irrigation rotations, and harvest times. Flexibility in irrigation systems may be a key to these gains. Research is needed to assess the trade-offs between increased costs of construction and operation on the one hand and, on the other, greater capacity of irrigation systems to deliver and drain water on a much more flexible basis than is now characteristic of most flood-type irrigation systems for rice.

No doubt the most important role for the government in fostering a successful long-run diversification process is in creating the overall policy environment for the agricultural sector. At all three levels of concern--the farm level, the agricultural sector, and the macro economy--government policy acts to buffer or reinforce pressures and opportunities in world markets. Policies for price stabilization, taxes and subsidies, foreign exchange rates, industrial protection, domestic inflation, and budgetary priorities have a direct impact on the profitability of agriculture in general and the incomes to be

earned from individual crops in particular. Certain policy interventions in these areas may actually impede the diversification process; successful rice price stabilization programs certainly seem to have that impact. Too much intervention no doubt harms the whole development effort. A more market-oriented approach to development with greater reliance on the private sector, however, may not deal adequately with the deep-seated concern in all countries for food security: the need to provide adequate quantities of food and relatively stable prices for the primary food staple of the population. Wherever market-oriented policies to stimulate diversification conflict with stability of food prices and objectives for food security, other strategies for diversification are likely to be sought.

Creating a profitable environment for commodities other than rice or wheat requires substantial economic and technical research and innovative economic and project analysis. The pervasive theme in all these areas is the need for greater flexibility in farming systems and a recognition of the important trade-offs in the short run between efficiency and income distribution. A major conceptual problem for the research is to determine what "optimal" flexibility means in different circumstances. In nearly all agricultural systems, flexibility has a cost. Measuring the benefits of increased flexibility and comparing them with these costs is no easy task.

The main goals for economic and project analysis center on understanding the role of rice and wheat in the rural and macro economy and determining the extent to which other crops, livestock, or rural activities can substitute for the role traditionally played by the basic staple. Techniques of project appraisal need to be modified to capture the benefits of increased flexibility that new investments can generate, but methods of valuing that flexibility must be agreed upon. If there appear to be trade-offs between flexibility and other important social objectives such as income distribution or food security, the valuation of flexibility will be highly controversial. In particular, price stabilization schemes for staple foodstuffs significantly impede the development of more flexible, diversified agricultural systems. Better technology for non-staple crops and

livestock, better managed irrigation systems, and improved marketing infrastructure can shift the balance of cropping systems somewhat. But the importance of rice and wheat in the food economy will not disappear quickly, and the policies that favor production and consumption are likely to continue--to the detriment of diversification programs.

Donor agencies should concentrate on laying the foundation for a successful transition to a more diversified agriculture when it becomes feasible in broad strategic dimensions, not with the impact of concerns over food security on the short-run process of diversification. Several topics provide the focus for a continuing dialogue around this theme. Gradually building an effective role for the private sector is the basis for efficient growth if several complementary institutions and measures to stimulate competitive forces are established along the way: the legal framework for a market economy; and public investment in a network of physical infrastructure, communications and information systems, and established grades and standards appropriate to the stage of development of individual commodity systems. No diversified market economy can function without working capital; an efficient rural credit system accessible to traders and small-scale rural entrepreneurs is probably more important than credit programs for small farmers.

The underlying rationale for the protection of rice and wheat farmers in much of Asia and the Near East cannot be ignored in the policy dialogue. It is easy to dismiss this protection as "political," to argue that it is costly to consumers and the budget, and to maintain that diversification out of rice or wheat and out of agriculture is the only efficient path for countries to take. Pushed very hard, this approach will fall on deaf ears in the 1990s just as it did in the 1980s. A more positive approach is possible. Linking short-run problems of structural adjustment, which all governments face, with longer-run paths of structural transformation and economic development, offers a time horizon for the diversification process that fits the nature of the problems. Low economic returns from growing rice or wheat can be solved eventually by rural diversification, but short-run steps can have only a marginal impact on the momentum of

the rice or wheat economy. Investments by donor agencies and opportunities for policy dialogues should be used to point these short-run steps in the right long-run direction.