Food Prospects for the Developing Countries

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Current interest in food prospects for the developing world is based on a set of four relatively straightforward questions. Upon closer analysis, however, these questions prove to be successively more complex.

The first question is quite direct: Will food production in the Third World grow more rapidly than population? The answer seems to be a clear yes. Between 1961 and 1977, the growth of Third World production of major food crops averaged 2.6 percent a year, slightly higher than the 2.5 percent annual increase in population (Leonardo Paulino, forthcoming). There is every reason to believe that Third World food production in the future will continue to exceed population growth, since the processes for accelerated agricultural growth are now in place in so many developing countries and population growth rates are generally declining. The clear exceptions are Sub-Saharan Africa and the least developed countries (these are nearly synonomous). Even with a change in agricultural policies in these countries, there will be considerable time lags before food production growth rates exceed population growth rates.

The second question is more involved, and much more important with respect to its policy implications: Will ratios of food production self-sufficiency increase in the Third World? In the long run, self-sufficiency ratios in the Third World will indeed increase—but that is the long run of decades. In the short run of this decade and the next, these ratios will just as certainly decline, as rapidly accelerating growth in the demand for food in the Third World exceeds capacity to accelerate domestic production growth rates. This conclusion is reinforced by the tendency for accelerated food production growth to be associated with forces that further accelerate growth in demand.

The third question is decidedly complex: Will the real price of food (defined in terms of relative shifts in the demand and supply schedules for food) shift upwards over the next two decades (as compared to the zero or slightly negative trend over the past few decades)? It is my judgment that it will. In the Third World, demand for food will clearly continue to shift more rapidly than supply. It is less certain that the forces in developing countries will overbalance the converse relationship for the developed countries.

The final question is the most far-reaching: What will be the impact of these forces on the nutritional status and the degree of poverty of low-income people? Since low-income people spend 60 to 80 percent of increments to income on food (see my 1978 article), food prices are a principal determinant of their real income and nutritional status. Increasing per capita food production and imports allow a rising number of people to eat better. Preliminary analysis of cross-section data for African countries show that as aggregate per capita food supplies rise, the proportion of malnourished children declines (see Shubh Kumar, 1981). Increased capital intensity and the dynamics of food production itself will raise real wages for much of the laboring class (see Uma Lele's and my 1981 article). But for some individuals and particularly for those in countries left out of development processes, the situation will be more difficult in the future than in the decades of the 1950's and 1960's. This, I should emphasize, is the note of pessimism in this paper.

I. Past Trends in Food Crop Production, Consumption, and Trade in the Third World

The broad trends in food relations for developing countries are clear: food production growing more rapidly than population,

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but less rapidly than consumption; and exports growing, but less rapidly than imports. Between 1961–65 and 1973–78, net imports of major food staples by developing countries (excluding the People's Republic of China) increased from about 5 million tons to 23 million tons, an average rate of increase of 13 percent per year (Paulino).

Categorizing the growth in food imports by income growth rates illuminates trends. Countries with the lowest growth rates in per capita incomes (largely located in Africa) had the most rapid growth rate for net imports. This is the product of a very poor record in food production growth (well below population growth rates) and rapid growth of urbanization (itself a cause of the slow growth in agricultural production) based on large net capital inflows financed from foreign assistance.

The next three categories of per capita income growth have successively more rapid rates of growth of net imports. Presumably the 1–3 percent per capita income growth rate countries have relatively slow growth in demand for food and a foreign exchange allocation policy that restricts food imports. Those with successively higher income growth rates have a more rapid growth in demand for food and a trade regime that facilitates allocations to food imports.

Two elements of the recent past deserve special note: the very rapid growth in food imports by the fast income growth countries; and the association of the most rapid growth rates in food production with increased food imports.

During the period 1970–77, twenty Third World countries, containing some 700 million people, averaged growth rates of 4 percent or better in per capita income. Eight of these countries, all major oil exporters (Algeria, Indonesia, Iran, Iraq, Mexico, Nigeria, Saudi Arabia, and Venezuela), had an average per capita income growth rate of 5.6 percent per year. Such growth rates fueled an extraordinary rise in the demand for food in these countries, a demand that their still fledgling agricultural sectors were quite unable to meet. Thus, in the period 1970–77, food imports to these countries grew at the rate of 19 percent per year in real terms. In the future, returns from high investment rates of the past and reduced future investment rates will both serve to sustain high per capita food consumption growth rates.

Perhaps even more symptomatic of the future, however, are the growth patterns of the twelve rapid growth Third World countries that are not major oil exporters. Brazil, Hong Kong, the Democratic People's Republic of Korea, the Republic of Korea, Malaysia, the Philippines, Singapore, Syria, Taiwan, Thailand, Tunisia, and Turkey had an average growth rate of per capita income of 5.6 percent for the same period. In these twelve countries, the demand for food rose by well over 5 percent a year. These countries are now, of course, experiencing a substantial slowdown in their growth rates as a result of the current recession. But they have developed the institutional base for sustained economic growth and can be expected to resume a rapid pace of growth as soon as the current recession has run its course.

Given the dynamic nature of these high growth rate countries, it is possible that some of them will be able to achieve the 4 or 5 percent annual growth rates in food production necessary to meet demand growth. However, the historical record suggests that most of these countries will not be able to achieve such food production growth rates.

More striking in terms of implications to trade in food is the finding that the sixteen developing countries with the fastest growth rates in basic food staples production over the period 1961–76 collectively more than doubled their net food imports (in tons) during the study period (see Kenneth Bachman and Paulino, 1979). From 1961–76, the average growth rate for basic food staples in these countries was 3.9 percent, but the high growth rate in food imports meant that their self-sufficiency ratio actually declined two percentage points. These data demonstrate that, while it is possible for rapid growth, low-income countries to achieve impressive increases in food production, it is still quite difficult for such production to keep pace with the rate of growth in demand for food.

It is important to note one further historical note that is useful for judging the future: improvement in crop yields was the main

contributor to the growth in food production in the developing countries between 1961 and 1977. Output per hectare of major food crops increased by 1.9 percent annually, and accounted for more than 70 percent of production growth, whereas increases in the harvested area averaged less than 1.0 percent a year, contributing the other 30 percent (Paulino). It is likely that the relative importance of yield increases as a source of growth will continue to increase. Yield increases are the product of technological change that requires complex institutional development and large numbers of trained people. These are processes that take time. In Asia, for example, technological change in agriculture requires large-scale public investment in irrigation, as well as a favorable price climate and an adequate infrastructure support system.

It is notable that in Africa where per capita food production has declined 15 percent since 1969–71, the median government expenditure on agriculture for the period 1963–73 was only 7.6 percent of the total government budget (see Norman Nicholson et al., 1979). Public sector allocations to agriculture are proportionately even lower in Latin America, but these are economies with much larger nonagricultural sectors (see Victor Elias, 1981). By means of contrast, in the Punjab of India, where the new agricultural technology has made a significant contribution to increased food production, the state government allocated to agriculture 11.0 percent of its expenditure.

II. Phases in Food Demand-Supply Growth

The way in which the processes of economic growth accelerate growth in demand for food and causes food imports to burgeon during the developmental process is illuminated by depicting stylized phases of economic growth.

At an early stage of economic growth, people are very poor, desperately wishing to consume more food, yet unable to do so because of low incomes. In this stage, poverty causes high death rates and hence only modest rates of population growth, while per capita income grows hardly at all. The result is a 3 percent or less growth rate in effective demand for food. That rate that can be met by more human effort on a slightly expanded land base. In this stage, population growth roughly meets its own demand for food.

As development occurs, the population growth rate increases. But, even more importantly, income begins to grow rapidly, and the two together increase the growth rate of demand for food by some 30 percent over the earlier phase. Such a rate of growth in food demand exceeds all but the most rapid known rates of food production growth. In practice, high income growth reduces two of the previous stages' sources of growth—expansion onto poorer, less-productive land area and the use of labor to intensify production at lower and lower returns to that labor. Thus prolonged and continued technological innovation in agriculture is needed in this stage, both to balance loss in production sources and to meet rapid growth in demand. Even 2 to 3 percent growth rates in land productivity are considered high. It is for this reason that most countries in the high growth, medium-income stage find it necessary to rely upon increasingly rapid growth in food imports to meet much of demand growth. It is only countries with unusual potential to expand onto high productivity land areas that can avoid this phenomenon.

In later stages, of course, population growth rates decline and growth in income begins to have little effect on demand for food. Meeting demand growth then becomes more manageable, particularly since by then food production growth rates have become institutionalized at high levels. It is in this stage that food imports become unnecessary and agricultural surpluses begin to accrue.

Thus it is increasing per capita income that is the dynamic factor underlying the growth in food demand in the Third World. However, it is important to realize that as demand for food rises in response to income, the relative composition of that demand changes over time. Rising income causes demand to shift to the more preferred cereals, and to highly income-elastic livestock products. The latter, in particular, become increasingly important in the consumption patterns of consumers, as evidenced by the fact that between 1961–65 and 1973–77, annual

meat consumption in the Third World increased at a 3.4 percent rate, significantly faster than population growth.

The rising importance of livestock products in rapidly developing countries plays a major role in restraining the decline in the overall income elasticities for basic food staples. The income elasticity of demand for livestock products remains fairly stable to relatively high income levels. This results in a strong derived demand for basic food staples, even as income rises. This phenomenon is reinforced by the fact that among livestock products, demand for pigs and poultry, both of which are produced at the margin largely on concentrate feed, grows most rapidly.

It is instructive to note here a peculiarity of the derived demand for feed for livestock and its effect on the aggregate income elasticity of demand for basic food staples. At low incomes, livestock commodities comprise a small budget share and hence the derived demand for basic food staples is quite small. As incomes rise, the income elasticity of demand for basic food staples for direct human consumption declines; but at the same time the income elasticity of demand for food staples for livestock consumption begins to increase. Initially, the base level of the derived demand is very small relative to direct demand, but, with sharply different elasticities, the relative weights change quite rapidly. Thus the income elasticity of demand for total food staples forms an S shaped curve, with the weighted average elasticity first declining, then rising, and then eventually declining again. It is in the period when the weighted average elasticity of both direct and derived demand peaks that developing countries move onto the international market for substantial aggregate imports of food. Given that imports are initially small relative to total consumption and hence highly leveraged, it becomes clear why analysts are normally caught unawares by the explosive growth in imports of basic food staples by developing countries after a period of slow growth in or even declining imports.

III. Food Projections to the Future

On the basis of a straight-line projection by country of 1966–77 production and income trend data, and UN medium population projections, a total net deficit of 75 million metric tons of major food crops in the Third World is projected by the year 2000 (Paulino). Although this represents only 5 percent of the total projected food demand in the developing world in that year, it is nearly three times the total estimated food deficit of these countries in 1977. As might be expected, the largest net production shortfall (65 million metric tons) is projected in those countries experiencing the fastest rate of income growth.

What caveats should we have in mind in using simple projections of the past to depict the future? First, the base period was one of unusually rapid income growth in developing countries. Certainly extrapolation of that period assumes not only an end to the current recession but additions to the ranks of fast growth countries to balance inevitable dropouts. These are hardly the days when such optimistic projections can seem realistic. However, large countries such as India and China have developed many of the characteristics thought to be precursors of accelerated economic growth. Further, few of the fast growth countries of the past decade have reached the stage of a major aggregate impact of growth in livestock consumption on demand for basic food staples.

Second, while it is unlikely that African food production growth rates will accelerate sharply in the near future, one may also question whether foreign resource transfers will permit continued growth at the depicted rates. On the other hand, the political pressures to preserve stability through foreign aid seem unlikely to change.

Third, the projected imports into the fast growth countries are so immense as to question the linear extrapolation. However per capita projected livestock consumption does not exceed levels of high-income Western countries, while cereals for direct human consumption are projected to decline.

Fourth, isn't it important to ask whether the prospect of such large food imports might not induce Third World policymakers to take steps to accelerate present food production growth rates? However, several of the fast growth countries have already achieved very respectable production growth rates, while

others have such rudimentary institutional structures as to delay the achievement of such growth rates for a long time.

It is considerably more difficult to estimate the ability of the developed world to respond to projected food deficits in the Third World. A simple projection of 1966–77 production and consumption trends projects a net surplus in the developed world of only 46 million metric tons of basic food staples by the end of the century (Paulino). However, this is the product of a huge surplus in the United States and a huge deficit in the Soviet Union. In contrast, projection of the longer period 1961–79 provides a net surplus of 196 million tons! Where one falls between these two projections is a function of such factors as: EC policy on prices; the extent to which U.S. technology generation can maintain high rates of yield increase; and, Soviet Bloc policies on meat consumption and rationalization of production policy. Perhaps it is not unreasonable to think that a downward trend in prices would bring little of the shift needed to generate larger net exports and an upward trend would bring a lot.

IV. Conclusion

Given the uncertainty, prudent action for developing countries is to search assiduously for cost-reducing technological change in agriculture. To the extent that policies in developed countries generate more than adequate surpluses, marginal investment in agriculture in developing countries will be justified by cost-decreasing technological change in agriculture. Because of the relative size of agriculture in developing countries, equity and income distribution concerns may still press for added emphasis on agriculture. Failure by developing countries to develop policies and investment allocations favorable to expansion of agriculture runs the risk of suboptimal resource allocation if import bills and food costs are rising and the certainty of a narrow base of participation in development.

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