

# Issues in World Agriculture— a U.S. Perspective

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The purpose of this paper is to define the major issues in world agriculture subject to the analytical tools of agricultural economics. World agricultural issues are defined as issues that arise outside the United States but that affect the concerns and interests of the United States.

A U.S. perspective is taken in this paper for three reasons. First, as each issue in world agriculture can be seen from many perspectives, each of which gives a different view of the importance of the issues' elements and courses of action and perhaps even producing a different final assessment, it is best to state the perspective adopted explicitly at the outset. Second, since this paper is being done for the American Agricultural Economics Association, it seems appropriate to adopt the dominant perspective of that group. Third, because American agriculture is large and because trade is important to the prospects of American agriculture and the global concerns of the United States, the perspective of the United States is of considerable interest to other groups.

Because the range of issues in world agriculture is immense, analysis is facilitated by classifying the issues so that their interactions are emphasized. I therefore divide the issues into three categories:

*International Food Flows.* International food flows are extraordinarily large by past standards, growing rapidly and moving largely and increasingly from the developed to the developing countries of the world. These phenomena are recent and ill-understood. Policy has not as yet fully adjusted to them. The flows are mostly commercial, but noncommercial

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flows of food aid are large, controversial, and their relation to commercial flows are also poorly understood.

*Global Poverty.* Massive numbers of people exist in such abject poverty that they do not even receive enough energy to live an active, healthy life. Such poverty is concentrated in the developing countries of the world, and there is a widely perceived need in developed countries to lift people out of such poverty and malnutrition and an unarticulated belief that it is possible to do so. Thus, the global poverty problem is also construed as a U.S. problem.

*Unequal Distribution of Human Capital.* The extraordinarily unequal incidence of human capital in the world is the basis of inequalities in development and of the concentration of poverty. Redressing this inequality would increase the prosperity of all nations, including the United States, while the means for redressing this inequality lie substantially with the United States. Hence, this problem too may be construed as a U.S. problem.

For each of these issues I will touch upon the implications for research, extension, and teaching. I will attempt to show the importance of each of the issues and to show how each issue is related to the other. I will attempt as I go to diagnose gaps in knowledge in these three areas and to define the research needs. The paper will treat both extension and teaching, but will emphasize research since once that need is clear, the other two fall rather easily into line.

## International Food Flows

**THE BASIC ISSUES.** Net imports of basic food staples into the developing countries (excluding China), rose from an annual average of 8 million tons between 1966 and 1970, to 27 million tons from 1976 to 1980, and to about 50 million tons in 1984. By projecting production and consumption, Leonardo Paulino (1986) depicts that flow as increasing to between 75 and 80 million tons by the year 2000. Although some countries in the Third World are significant net exporters, they are few. Conversely, most developed countries have become net exporters of basic food staples. Thus there has been a dramatic increase in net exports from developed to developing countries. This increase is the product of structural changes in demand and supply conditions that are a natural and logical product of specific stages of economic development.

As development gets underway, the growth of basic food staple production tends to accelerate. Since the processes for accelerating growth are basically those that shift the supply function outward, and since shifting

the supply function in turn depends largely on processes of complex institutional changes that require rapid expansion of supplies of trained people and the institutional structures that support them, these processes are necessarily slow. In the meantime, development increases the incomes of low-income people, who have high marginal propensities to spend on food. In fact, at this stage, when marginal propensities to spend on food are high, the processes of agricultural growth with strong employment multipliers tend to increase demand rapidly even as supply increases (Mellor 1976). The result is that demand tends to shift much more rapidly than supply, causing net imports to increase rapidly. This tendency is documented in Paulino and Bachman (1979) and in Paulino (1986), particularly for the countries for which basic food staples production is growing rapidly. Conversely, once the development process has neared its apogee, the shifting of the supply function tends to become institutionalized and hence supply continues to grow rapidly. In the meantime, marginal propensities to spend on food decline sharply. As a result, as incomes increase supply tends to shift much more rapidly than demand, creating exportable surpluses. A peculiarity of the present situation in the world is that massive areas and numbers of people are in each of these two stages: the one with a tendency to increase exports rapidly and the other with a tendency to increase imports rapidly. Since food trade, although massive by past standards, is still a small proportion of total food production, it becomes difficult to predict trade balances and net pressures on prices since small differences in the rates at which supply and demand shift in these large blocks of countries will have large effects on the volume of trade and prices.

In the mid 1980s, with the economic slowdown in world demand, shifts in demand in developing countries have been slowed. Shifts in supply, which are subject to much longer-term phenomena, have continued to be relatively rapid. The latter has also been somewhat true of the developed countries. The product has been tremendous downward pressure on international prices. The appearance of that pressure is, of course, greatly exaggerated in the largest exporter, the United States, because of increase in the valuation of the dollar which has causes largely outside of agriculture. A look at the late 1960s and the early to mid-1970s, when world development was moving quickly, suggests that there was modest upward pressure on real food prices. Since the processes of economic development and rising resource productivity are now somewhat endogenous in developing countries it would not be surprising to find that global food supply and demand balances were coming to resemble those of the late 1960s and early 1970s, with once again mild net upward pressure on food prices. For that to happen, an acceleration in technological change associated with the new biology would have to be overbalanced by widespread accelerated growth in the high potential growth countries of Asia and Latin America.

Third World countries represent the dynamic aspect of future import demand. Of course in the last decade or so the Soviet Union has also been a major and rapidly growing importer. In this context it is useful to see the Soviet Union as a late stage developing country. Marginal propensities to spend on food are still quite high in the Soviet Union, partly because incomes are low and perhaps partly because of the low availability of non-food goods and services. Long before the developing countries, the Soviet Union will begin to decrease its marginal propensity to spend on food and will gradually import less. In fact, the period of explosive growth rate of supply in the Soviet Union has been considerably more rapid than in Western Europe. The real difference in the trade flows is caused by demand.

It is notable that the import demand of developing countries grows explosively when livestock consumption grows substantially and consumes a significant proportion of total basic food staples. In the early stages of development, livestock production tends to be built primarily on waste and byproduct feeds. As the growth of livestock production accelerates, the supply of those types of feeds becomes highly inelastic and there is a switch to the much more elastic supply of food staples that can be used for human consumption. As that process accelerates, the proportion of basic food staples fed to livestock increases.

Since the demand for livestock products tends to remain elastic with the elasticity changing little as incomes rise, that demand tends to become the driving force in the demand for basic food staples. At that stage growth in demand may exceed the growth of domestic production significantly and therefore cause growth in imports to explode. The most dramatic case of this is Taiwan, which has increased its livestock feed as a proportion of total domestic utilization of cereals from 4 percent in 1960 to 1962 to about 50 percent in 1980 to 1982. Cereal imports now represent some 58 percent of total consumption of cereals (Sarma 1986). This is an extreme case, but illustrates the point well.

**THE RESEARCH AGENDA.** The agenda for research on international food flows develops naturally from the above exposition. While the broad outlines of global food flows are clear, the details are so unclear as to prejudice effective planning.

We need a detailed understanding of the temporal path of supply and demand balances in developing countries. It is possible that rather than the simple picture I depicted earlier, that when supply shifts first become substantial, based on basic agricultural research, that supply will move ahead of demand, providing an early exporting phase (Touji 1987). Then the employment multipliers derived from agricultural growth would gradually become more powerful, at which time demand would move ahead more rapidly, causing a shift to imports. All of this must be related closely to the

progression in the livestock sector. We need careful studies of these matters to understand the timing of structural changes. The implications for agricultural exporters are immense (perhaps as much as tens of millions of tons of exports annually), with profound implications for domestic agricultural production policy in the developed countries.

We also need to more fully understand the relative importance of supply shifts and price responses in the developed countries. We now have a substantial literature and many polemics implying that the supply response to price in developed countries is large. There has been less discussion of the role of shifts in supply, how these relate to the diminishing weight of shifts in demand, what the implications are for aggregate exportable surpluses, and the interaction of those surpluses with price. One could provide many examples of the importance of this, but certainly the European Common Market is a prime case. There supply shifts are large, demand is essentially static, and prices are kept high. If European prices were brought down to equal world prices, would the response to price be large enough to overwhelm the continuing effect of the shifts in supply? How strong are these shifts in supply? What might be done to reduce them? Are they affected by prices? There is much speculation but little hard data on these complex questions. Indeed, we have polemics between neoclassicists and structuralists but little analysis of the interaction of the two types of forces. One could raise similar questions for North America.

As there is considerable uncertainty about supply shifts and price responses in both developed and developing countries, the question of what cost food production in developing countries should be pursued over what time span becomes complex. There can be little question that all developing countries must seek to shift supply through agricultural research, extension, infrastructure development, and input supply. The numbers of people in the basic agriculture and food sector is so large and capital is so constrained that it is nonsense to talk about these countries as having no comparative advantages in food. One can also make the case that large areas in virtually every country have a comparative advantage in pursuing technological improvements in agriculture and in obtaining a rapid rate of growth from that technological advance. That is not the issue. The issue comes from expensive capital investments in agriculture for land reclamation and irrigation. How much can be spent on these in view of future world food supply balances and the implicit price situation? There are clearly projects and programs in developing countries with rates of return that are low with any reasonable estimate of future prices. When appeal is made to price incentives in developing countries in the context of structural processes that take decades to foment, what price regime and hence what cost regime do we have in mind? The implications that alternative policies have for the major exporters are large. Careful empirical studies on this set of questions is needed.

We need to analyze much more carefully the appropriate commodity composition of trade in the future. This has several components. There is the whole issue of cereals trade. Clearly cereal flows from the developed to the developing countries will grow for several decades. How much will they grow? At what price? What should be done to encourage them? What other issues need to be raised? There is also a complex set of issues surrounding the trade of labor-intensive agricultural commodities. This would include much of livestock production and fruits and vegetables. How much comparative advantage and specialization can there be among Third World countries and hence how rapidly can intra-Third World trade in these commodities grow? Furthermore, what should the long-term comparative advantage be for these commodities in trade between developed and developing countries? At the most simplistic level, could the developed countries sell much more cereal if they were willing to import more livestock products, fruits, and vegetables? How does this vary among developed countries? What are the implications for the European community's expansion? What are the implications for the location of fertilizer production and other capital-intensive industries?

Finally, the mechanics of trade processes need to be better understood, particularly the relationship between state and private institutions and how they affect demand, supply, and prices.

**TEACHING IMPLICATIONS.** As our knowledge of these issues grows, it obviously needs to be conveyed to the current electorate in the United States through extension programs and to the future electorate through teaching programs. There needs to be an emphasis first on the simple issue of the interlocking of economies in the world and of the tremendous importance of the Third World to U.S. agriculture. The effort at selling foreign aid on the basis of poverty alleviation, particularly in the 1970s, created a clear misimpression among the electorate in the United States. The developing countries are in general no longer poverty-stricken countries with no economic relevance to the United States. They are beginning to develop rapidly. Their poverty problems are, of course, immense, but they are diminishing in the context of rapid real and potential growth. We need to understand that and then see how it affects commercial exports.

## Global Poverty

**THE BASIC ISSUES.** Most of the poor are in the developing countries. We can say further that the poverty that cannot be met by modest redistribution of income within national boundaries lies in the Third World countries. For example, in the United States poverty is not normally defined to include

more than 10 to 15 percent of the population. Incomes below the poverty line in the United States could be raised above it by redistribution of a modest proportion of total national income. That cannot be said of developing countries. In most developing countries it would be difficult to define a poverty line that included 40 percent of the population, and that line would be considerably lower than one that included only 5 to 10 percent of the population in developed countries.

This raises an important philosophical issue. To what extent is concern for poverty constrained by national boundaries? When we ask the Rawlsian question of fairness and justice (Rawls 1971), do we assume that we would be plunked down as citizens of the United States of America, or is our random placement in the world to include all countries and people? I suspect that in answering the Rawlsian question we in effect open the possibility of being plunked down anywhere, but put the probability of coming down in the United States considerably higher than the proportion of the United States population to that of the rest of the world. Thus the philosophical issue is rather complex. Let me assume, however, that Americans think of themselves as having some concern with the probability of landing in the poverty-stricken classes in developing countries. We then see in the name of fairness and justice a philosophical basis for a U.S. concern and a U.S. interest in dealing with poverty in Third World countries.

One should distinguish clearly between a long-run solution to poverty in developing countries and its short-run mitigation. The long-run solution is development. If one is concerned with poverty in developing countries and wishes to deal with it through development, one necessarily advocates a policy that puts the primary emphasis of public policy on developing agriculture and then deriving linkage and multiplier effects from agricultural growth that stimulate the growth of other sectors of the economy (Mellor 1976). This growth pattern has a high employment content and can induce high rates of growth quickly. It is reasonable to think that once a country has developed minimal institutional structures and a body of trained personnel that it can eliminate most poverty, (i.e., getting it down to U.S. proportions within 15 to 25 years (Mellor 1976; Mellor and Mudahar 1974).

There is also the possibility that poverty can be mitigated in the short run. That obviously must be done by redistribution. As far as the developing countries are concerned and because of their low average incomes, we have to think substantially in terms of redistribution from the developed countries. Foreign assistance to deal with the long-term problem and dealing with the short-term problem should be distinguished here. The short-term problem shows itself most particularly in the inadequate intake of basic energy sources. In other words, it is largely a food problem. Thus we are talking about moving quantities of food beyond what the market moves

from surplus-producing developed countries to developing countries with food deficits. This has to be done in a way that does not excessively depress domestic prices in the receiving countries; after all, one does not want to obstruct the long-term solution to the problem. Avoiding a price depressing effect is simply done when the objective is to reduce poverty because one wants to see to it that food enters the hands of people with high marginal propensities to consume it, precisely because they are very poor. There are two major vehicles for achieving this. One is through increased employment of the poor and the other is through subsidies decreasing the price of food. In either case the objective is to increase food consumption.

**THE RESEARCH AGENDA.** The research agenda for dealing with the long-term problem of poverty includes research on what agriculture needs to develop with particular emphasis on agricultural research and how to optimize it, input supply and how to maximize its rate of growth, and development of infrastructure. All of this involves issues I will take up in the third part of this paper. Research is also required on how to maximize the growth of employment with an agricultural strategy. This requires work on the linkages and multipliers between agricultural growth and nonagricultural growth and how they may be attained most effectively. We need a good deal more description of those processes and then analysis of the policy needs.

The research agenda for short-term needs is quite straightforward. We first need more research on how to increase employment as supplies of food increase. Second, we need to learn more about food subsidies and how they can be best operated when food is transferred internationally. In this context we need much more research on food aid since that would presumably be the primary vehicle for transferring food from developed to developing countries to mitigate poverty.

**TEACHING IMPLICATIONS.** Teaching in the United States on global poverty has two dimensions: (1) enabling people to comprehend the problem and (2) making it possible to understand the role of food in growth and poverty reduction and its relation to developed country agricultural policy.

Teaching on the first dimension needs to attend to three issues: (1) the philosophical issue of national or global responsibility for poverty, (2) the relationships between long-term reduction of poverty and development strategy and between agricultural employment policies and functions and poverty reduction, and (3) the time required to reduce poverty in countries in different stages of growth.

Food aid deserves special emphasis in teaching programs because it can be so important to U.S. agriculture and because of the complexity of its

relationship to poverty reduction in developing countries. Emphasis needs to be given to the differences in the demand elasticities of countries and income groups and to policies that can ensure that increments to demand in developing countries match additions to supply from food aid.

## Unequal Distribution of Human Capital

**THE BASIC ISSUE.** There is an extraordinary disproportion of human capital between the developed countries and the developing countries. Indeed, it is not an oversimplification to say that is the root of the differences in development. The basic issue here is to what extent is it in the interest of the developed countries to use their disproportionate share of human capital to redress the imbalance and how can they do it? Obviously, if it is believed that development of developing countries will be advantageous to the developed countries, then they should show interest in this issue. It is probably fair to say that this is the essential issue of foreign aid. After all, we know that pure capital transfers have low rates of return in developing countries precisely because of the scarcity of human capital. This is not to say that only human capital should be transferred, but one should see the basic relationship between human capital and the returns to other forms of capital.

While I have stated this issue in general terms, it is of particular importance for agriculture. Agriculture needs a vast set of complex institutions if it is to improve. They must be staffed by highly trained people. This ranges all the way from the enormous number of people with advanced degrees needed in the agricultural research systems to the large number of people with college degrees to run large numbers of other institutions.

The emphasis given to different levels of training raises complex issues. Emphasis has recently been put on primary school education. In a number of African countries that emphasis has been from the point of view of what development requires. Related to this is how to transfer human capital at the various levels of education. This transfer is probably easier to make at the higher levels than at the lower. This means that the proportion of foreign assistance from developed countries at each level may not be the optimum for the country assisted. The relationships between the number of people trained and the institutions built to receive them are complicated; one cannot change without change in the other.

**THE RESEARCH AGENDA.** Probably the most important issue in the human capital research agenda is the proportion of expenditures allotted to the different levels of education. Nearly all countries expend a lot on education.

That is probably politically determined, so that research on what the overall expenditures should be would probably have little influence. The proportion given to each level is probably somewhat politically determined as well, but the results of research would be more likely to influence the process.

There is much research that needs to be done on the role of technical assistance in development (i.e., on transfers of human capital from developed to developing countries). How do land-grant colleges affect the process on increasing the human capital of developing countries? What are the institutional arrangements needed for the process? How can expatriates be useful? In what proportion should expatriates help build institutions and should people be trained abroad?

**TEACHING IMPLICATIONS.** There is a tremendous need to develop awareness that human capital transfers to developing countries are needed so that the institutions in the United States can be tuned better to this purpose. Beyond that, there is a need to teach the relation between technical assistance and the development of human capital in developing countries.

Finally, teaching the relation between human capital, development, poverty alleviation, and international food trade ties together the three elements of this essay and tells us much about the global economy in which we will live for the next few decades.

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