

Priorities in Agricultural Economics As a Result of the World Food Challenge

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Abstract

Priorities are examined by the discussion of three issues: (a) managing the world food economy; (b) expanding agriculture's capacity to produce; and (c) achieving equitable participation by rural people in the dividends from economic growth. Vast content change in micro-economics is predicted for courses in the near future.

The events of the last two years have demonstrated with some force the inadequacy of the institutional arrangements that have been developed to manage the world's food economy. A combination of political, economic, and natural events have induced a degree of instability in world commodity markets comparable to that following both World War I and World War II. On the political-economic side, (a) the decision by the USSR to permit expansion of livestock consumption even during periods of poor grain harvests, and (b) the decision of the U.S.-Canadian grain export cartel to discontinue the role of residual suppliers (and of their assumed role in stabilizing world grain prices) have been particularly important. Among the natural influences were the adverse weather in the USSR in 1972, the poor grain harvests in Southeast Asia due to both drought and flooding since 1972, and the continuing drought in the Sahelian region in Africa (1, 2).

Managing the World Food Economy

The community of nations has moved reluctantly toward acceptance of international responsibility for management of the world food economy. The establishment of the Food and Agriculture Organization (FAO) was a response to the disorganization of the world food economy resulting from the drive toward autonomy in food production during the interwar period and the stress on world food production systems during and immediately after World War II. The post-World War II attempts to formulate and implement international commodity agreements, first under individual commodity protocols and later under the umbrella of the General Agreement in Trade and Tariffs (GATT), reflected another set of concerns arising from the same experience.

As yet, however, effective institutional arrangements for the management of the world food economy have not emerged (3). The political environment within which FAO decision making and resource allocation takes place has deprived it of the administrative autonomy and

professional capacity necessary to carry out its technical functions. And the system of commodity agreements that appeared so promising in the early post-World War II period gradually broke down after the mid-1960s. During the years of food surpluses in the 1950s and early 1960s the importers saw little gain from such arrangements. The shift from a secular pattern of chronic food surpluses, which persisted from the early 1920s to the mid-1960s (excepting the war years), to an environment characterized by alternating shortage and surplus has eliminated whatever limited interest exporters had in participating in the already weakened arrangements.

Perhaps even more important, by the early 1970s world grain surpluses — grain available for export on either a commercial or concessional basis — had become increasingly concentrated in North America. And within North America, the Canadian contribution declined relative to the U.S. contribution. In 1974-75 the United States is expected to account for approximately 45 percent of the world's total grain exports (4). There is no counterpart to the Organization of Petroleum Exporting Countries (OPEC) in grains because the United States is even more dominant in grain exports than Saudi Arabia is in petroleum exports. The capacity to exercise this monopoly power is, however, somewhat weaker in regard to grains than in petroleum because, in most countries, the short-run elasticity of demand may be more elastic for grain than for petroleum.

There is some prospect that the community of nations may again be moving toward acceptance of the idea of greater international responsibility for the management of the world food economy. There are signs of revitalization in FAO. The World Food Congress in Rome clearly focused the world's attention on the dangers inherent in the disarray currently existing in the international markets both for agricultural commodities and for critical industrial inputs such as fertilizer and pesticides.

There is little evidence that either the analytical capacity, the empirical knowledge of trade and price relationships, or the institutional innovations necessary to create a more favorable environment into effective action are at hand. It is not clear, for example, how much of the instability of grain prices is due to the "balkanization" of international grain markets or other institutional factors and how much is due to the underlying physical factors such as weather (5). There is no question, however, that the demand for economic knowledge regarding the effects of the behavior of agricultural commodity markets — particularly the implications of national policies and the policies of regional groupings such as the European Economic Community (EEC), on commodity market

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behavior and trade relationships — has shifted strongly to the right. There is an even stronger demand for the entrepreneurial capacity to utilize such knowledge in the design of more effective institutions to manage the world food economy.

Expanding Agriculture's Capacity to Produce

More effective institutional capacity to manage the world food economy is clearly of immediate significance. The development of a more effective set of national and international institutions capable of expanding agriculture's capacity to produce is even more important. Investment in the physical infrastructure needed to expand this capacity has represented a major component of both international aid efforts and national development efforts. Approximately half of International Bank for Reconstruction and Development (IBRD) lending for agricultural development has been for irrigation (6). Expansion of fertilizer production capacity and of highway and transportation systems have also received attention.

The returns to investments in physical infrastructure have been, however, relatively modest under conditions of static agricultural technology (7). The effect of new technology embodied in rice and wheat varieties has been to shift the demand curves for industrial inputs such as fertilizer and pesticides, and for irrigation and transportation, to the right. The effect of advances in biological technology has been to raise the rates of returns to investment in the capacity to produce industrial inputs and in physical infrastructure for agricultural development.

Recognition of the potential productivity of investment in agricultural research, and of the location specific nature of biological technology, has led to a shift in emphasis in both national and international development efforts toward greater investment in the development of professional capacity in the agricultural sciences and technology and in agricultural research. The Consultative Group on International Agricultural Research is completing the development of a series of international agricultural research institutes, such as those that generated the new wheat and rice technology, that is intended to link the emerging national research institutions in the developing world and the research capacity of the developed countries into an effective international effort to secure the potential gains in agricultural productivity for the developing countries of the tropics (8).

What are the implications of these developments for economics research? Clearly the problem of efficient allocation of resources to physical infrastructure, industrial capacity, research effort, and human resource development to achieve growth in the agricultural sector must be placed near the top of the public policy agenda in almost every developing country. The economics of resource allocation, which appeared to have so little to offer in the area of development strategy under conditions of static technology, becomes of critical importance once

the allocation of resources to the production of technical change and human resource development are considered in economic terms (9).

The demand for knowledge in economics (and in the social sciences in general) enters at two levels. There is the problem of the initial investment decision and the problem of operational efficiency. The steps that need to be taken to create the necessary capacity for meeting long-term growth in demand must typically be set in motion 10 to 20 years in advance. Even the initial steps necessary for establishing new industrial capacity to produce fertilizer and pesticides must be taken 3 to 5 years in advance. A decade may elapse between initiating the planning for a new irrigation system and a significant impact of the system on production. It takes 15 to 20 years to develop and staff an effective agricultural research system and to create the training capacity needed to keep such a system viable. (And it may take as many as two generations to significantly dampen the rate of growth in demand by modifying the population.) Efficient allocation of resources to such areas does not occur by intuition. There is a demand for the skills of the economist — welded by skillful economists.

Realization of the new income flows from investment in agricultural development is not easy to achieve. It has been estimated that the fertilizer industry in most developing countries has been operating at less than 60 percent of rated capacity. The discrepancies between *ex ante* and *ex post* estimations of cost-benefit ratios for a water resource development project have consistently been large. And many national research and extension programs have had no measurable impact on production. As the public sector has assumed an increasingly heavy burden of responsibility for economic growth and development, in both the high and the low income countries, the demand for new knowledge regarding the economics of "collective action" and bureaucratic behavior has risen (10-12).

Partitioning Growth Dividends

The demand for institutional changes designed to alter traditional patterns of income distribution appears to have risen sharply since the mid-1960s in both developing and developed countries. One source of this demand is the new income streams generated by technical and institutional change. Dissent over how to divide the new income streams, which resulted from the efficiency gains associated with technical change and improved institutional performance, represents a major incentive for institutional change.

In a neoclassical world of perfect competition, undisturbed by technical and industrial change, income streams generated by economic growth would be distributed to factors along the lines of the Ricardian theory of rent and the neoclassical theory of distribution. There would be no scope for using political resources to achieve economic objectives (13, 14). The gains would flow to the owners of factors characterized by relatively inelastic or

"landesque" supply functions. The development of institutional innovations to modify this "natural" or "technically" defined elasticity of supply of factors and products pervades both developed and developing economies. The effect of these institutional devices is to redirect income flows among factors and classes (15).

It is readily perceived by an increasingly sophisticated citizenry in both developed and developing countries that the capture of the new income streams by the suppliers of technically or institutionally defined inelastic factors — factors that act as a constraint on growth rather than as a source of growth — serves no necessary or even socially useful function. As a result, the availability of new growth dividends resulting from technical change often sets in motion attempts to redefine property rights designed to modify the way in which the new income streams are partitioned.

New Income Stream Stress

The new income streams resulting from technical change in agriculture have historically led to social and political stress among the several social and economic classes as they have attempted to gain control over the new income streams (16). There has been stress within the agricultural sector (among landlords, tenants, and landless laborers), between the agricultural and nonagricultural sectors (among farmers, middlemen, and landowners), and among regions within national economies (between lagging and favored regions for development investments). There has been stress between the public and private sectors over the level of resources that each could command out of the growth dividends. And within the public sector there has been stress between the "development" and the "control" or "defense" bureaucracies over access to the resources available to the public sector.

Hirschman has discussed the rising stress among economic and social classes in terms of society's declining tolerance for disparity: "In the early stages of economic development, when inequities in the distribution of income among classes, sectors and regions are apt to increase sharply, it can happen that society's tolerance for such disparities will be substantial. To the extent that such tolerance comes into being, it accommodates, as it were, the increasing inequalities in almost providential fashion. But this tolerance is like a credit that falls due at a certain date. It is extended in the expectation that eventually the disparities will narrow again. If this does not occur there is bound to be trouble and, perhaps, disaster." (17)

A major implication of the capacity of (a) technical and institutional change to lower the cost of generating new income streams and (b) the declining tolerance for income inequality is that the scope for trade-offs between the achievement of equity and productivity objectives is narrowing. There is a rising demand for policies that achieve greater consistency between equity and productivity objectives. And there is a demand for knowledge concerning the income distribution effect of alternative

economic policies and for the entrepreneurial capacity to design projects, programs, and policies to achieve greater consistency between equity and productivity objectives.

A good deal of recent discussion of the problem of achieving consistency between equity and productivity objectives has focused on the potential for programs of integrated rural development. However, an intensive review of the literature on rural development program accomplishments, in both rich and poor countries, suggests that rural development does not yet represent a viable program or plan objective (18). Rural development, particularly integrated rural development, can be described — not too inaccurately — as an ideology in search of a methodology, or a technology. The above assertion does require some qualification. It clearly has been possible in a number of situations, where high levels of professional inputs directed by dedicated or inspired leadership have had access to external resources — the Comilla project in Bangladesh for example — to mobilize village-level resources to produce differential rates of development in specific rural communities.

There remains, however, a major unresolved puzzle. Why is it relatively easy to identify a number of relatively successful small-scale or pilot rural development projects but so difficult to find examples of successful rural development programs? Neither the economics nor other social science literature reviewed by the writer seems to provide either definitive insight into the relative success and failure of rural development projects and programs, or effective guides to the design of more effective projects and programs, or effective guides to the design of more or effective guides to the design of more effective rural development programs. Returns to investment in rural development programs promise to remain low until social scientists can provide more definitive knowledge about rural development processes.

Implications for Economic Education

The implications of the rising demand for knowledge in economics are particularly significant for the several fields of micro-economics. In the writer's judgment, the next decade will witness sharp change in the content of what we teach our students in micro-economics. Recent advances in the theory of collective action, implications of the theory of technical and institutional change, and of the theory of human capital have hardly penetrated textbook treatments of the theory of consumer, firm, and market behavior. The author who successfully achieves a new micro-economic synthesis will replace Samuelson in general economics and Heady in agricultural economics as the source of knowledge for the next generation of economists and agricultural economists.

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Abstract

Many individuals have emerged recently as strong critics of animal production, particularly grain feeding of cattle, and have used exaggerated information, perhaps intentionally or because of ignorance, regarding cattle production. Critics' claims that 20 pounds of grain are required to produce one pound of beef are refuted. The conversion from grass to grain feeding of slaughter cattle is discussed along with the accusation that cattle are competing for our food supply.

In the last three or four years the livestock and meat industries have been attacked from a variety of fronts. Some attacks have been backed by considerable scientific research and little common sense, such as the banning of diethylstilbestrol from cattle feeds. Others, such as the suggestion to eat one less hamburger a week to free grain for starving Asians, are prompted by emotionalism rather than an objective analysis of the situation.

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The present animal agriculture predicament can be likened to the Watergate episode because of the many different versions of the livestock and meat production story, all supposedly authoritative and factual. Some critics of animal agriculture are individuals who have little or no understanding of animal and meat production but freely blast animal production practices because it is in vogue to do so, and it satisfies their need for a "cause." Other critics are knowledgeable in regard to one or more aspects of animal agriculture but refuse to look at the total picture.

Meat Consumption Increased

People in the United States eat more beef than any other meat, which may be one reason why beef has been the primary target of consumer complaints and boycotts. Total per capita meat consumption increased 16.8 percent from 1960 (160.9 pounds) to 1974 (188.0 pounds), according to the U.S. Department of Agriculture. Beef consumption increased 37.5 percent from 85.1 to 117.0 pounds during that time and pork increased slightly, to 66.5 pounds in 1974. Veal and lamb and mutton decreased to 2.0 and 2.5 pounds, respectively, in 1974.