January 14, 1991

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THE STATE OF THE GLOBAL FOOD AND AGRICULTURAL SECTOR

This chapter is divided into six parts. We first discuss the potential contributions that agriculture can make to the development of the general economy. Then we examine the gross misuse of agricultural resources globally. This is followed by a discussion of the gross disparity in the levels of development between the agricultural and nonfarm sectors in most nations. The connection between poverty and hunger is then taken up, and this is followed by a discussion of the emergence of a global food and agricultural sector. The last section in the chapter discusses the emergence of a global agricultural research system.

The Potential Contributions of Agriculture to General Economic Development

All nations start the development process with a major share of their resources and economic activities in the agricultural sector. Consumers in such countries also dedicate a major share of their income to the consumption of food and agricultural commodities. This is because their levels of per capita incomes are so low that it takes most of their incomes to provide for their subsistence.

The nature of the development process is that as per capita incomes rise a smaller and smaller share of that income is

devoted to the consumption of food and a larger and larger share of it is devoted to the consumption of goods and services produced in the nonfarm sector. This is known as Engel's law, and it is one of the most powerful forces driving an economy as it experiences economic development and per capita incomes rise.

Associated with this shift in consumption patterns is a shift in resources among sectors. Labor and capital shift to the nonfarm sector where it produces the goods and services consumers demand as their incomes rise. This shift occurs in response to normal economic forces unless governments intervene to distort product and factor price ratios. However, if measures are taken by the government to raise productivity in the food and agricultural sector, this process can be accelerated. Fewer and fewer resources will be needed in the sector to meet the increasing demand for output from the sector.

Unfortunately, many developing countries have attempted to obtain this shift in resources for the development of the nonfarm sector by shifting relative prices against the agricultural sector by means of distortions in trade and exchange rate policies. (See below.) In effect they have viewed agriculture as a sector to be exploited rather than to be developed so that the resources are released by means of an increase in productivity in the agricultural sector. Thus we see the premature migration of millions of people from rural areas to

urban centers in most developing countries and the rapid creaming of capital from the agricultural sector for the development of the nonfarm sector.

In addition to this release of labor and capital for the development of the nonfarm sector, agriculture also makes other contributions to the development process. In the first place it is often a significant source of foreign exchange. This foreign exchange is a particular form of capital, and can be used to pay for imports of raw materials, capital goods needed for the development of the nonfarm sector, and consumer goods not produced domestically. It can also be used to service foreign debt acquired as a means of financing a higher rate of development.

Agriculture also supplies food for the population that has shifted to nonfarm employment. This contribution to general economic development becomes increasingly important as ever larger shares of the labor force and population are shifted to urban centers and to employment in the nonfarm sector. Productivity needs to rise on a sustained basis if agriculture is to make this contribution on a sustained basis.

Finally, agriculture can be a market for goods and services produced in the nonfarm sector. This can be an important contribution to general economic development, since the nonfarm

sector will not grow unless it has expanding markets to absorb its increases in output. If agriculture is to play this important role it is imperative that per capita incomes rise in that sector and that modernization proceeds apace. As development proceeds, agriculture will first demand an ever larger consumption bundle from the nonfarm sector. Later, as the process of modernization proceeds, agriculture will demand modern inputs such as commercial fertilizers, pesticides, and machinery and equipment from the nonfarm sector.

Producing food for the growing nonfarm population, releasing labor for employment in the expanding nonfarm sectors, supplying capital for these sectors, earning foreign exchange, and providing a market for the goods and services produced in the nonfarm sector are the classical contributions of agriculture to the development of the general economy. There is another, more general, contribution agriculture can make, however, especially if agricultural development is promoted in such a way as to lower the real price of food by investing in agricultural research to produce a new production technology for the sector.

Given its importance as the basis of sound development policy, let's consider how this process works. The introduction of new production technology into agriculture raises resource productivity. In the beginning, the early adopters of this technology reap most of the benefits since they lower their cost

of production and the price of the commodity remains the same. As the new technology is adopted more generally, however, there is a tendency for the relative price of the commodity to decline unless it should be an export commodity and the country is relatively unimportant in the total trade of that commodity.

The effect of this decline in the real price of the commodity is to transfer the benefits of the new technology to consumers, at the relative expense of the producer. For consumers with given nominal incomes, a decline in the real price of food is equivalent to an increase in their real incomes. This increase will be larger as the commodity is more important in the diet of the consumers and as the increase in productivity is larger. The important feature of this process is that the benefits of the new technology tend to be widespread in the economy. Thus the development of agriculture by investing in agricultural research on domestically consumed commodities is a means of raising incomes on a very general scale in the economy.

There is still another important feature to this process, however. Low income consumers tend to spend a larger share of their income on food than do high income consumers. Thus low income groups tend to benefit in a relative sense as the price of food commodities declines, especially if the prices decline for the commodities consumed by this group. This is a highly

desirable feature of development policy. Not only are the benefits of development widely spread in the economy, thus promoting more general expansion in the economy through positive demand effects, the distribution of income is improved as well.

To draw the contrast more sharply, consider the case of concentrating the equivalent amount of development resources on the development of the automobile industry. At low levels of per capita incomes for the economy as a whole, only a modest share of the consumers would be users of automobiles and these would tend to be the upper income groups. The upper income groups would thus tend to receive the benefits of the development effort.

The moral to this story is that the importance of agriculture as the focal point of development policy has little to do with the number of farmers in the country. It has almost everything to do with the fact that everybody consumes food, and low income consumers spend a larger share of its income on food than do upper income consumers.

There is a related issue that merits further discussion. Early critics of the Green Revolution in India and other parts of Asia charged that upper income producers in agriculture tended to be the major beneficiaries of the new technology. That is true in the first instance, of course, since larger producers tend to

be the first to adopt the new technology. But as the adoption of the technology spreads, the benefits shift to the consumers, and especially to low income consumers. Producers ultimately tend to bear the costs of such a development process since eventually competitive pressures are brought to bear on them, some of them have to recrganize and get larger, and still others have to leave the sector and seek gainful employment in other sectors of the economy.

The remaining issue is those cases in which the new production technology is introduced into export sectors, or into commodities which compete with imports. In those cases the price of the commodity will not tend to decline unless the country is a major factor in international markets. Without the decline in the real price of the commodity, the benefits of the new technology remain with the producer and the consumer does not benefit. That is only partially correct, however. If new technology is introduced into the production of such commodities, the tendency is for these sectors to become more competitive in international markets and thus for the nation to earn more foreign exchange. This increased foreign exchange will come from increased exports in the case of export commodities, and from foreign exchange savings in the case of commodities that compete with imports.

In either case, the increased supply of foreign exchange can

be used to finance a higher rate of economic development for the economy as a whole. The benefits will again tend to be widespread, although this will depend importantly on the kind of development policy pursued vis-a-vis the nonfarm sector. Higher rates of economic development make it possible to absorb a higher rate of outmigration from the agricultural sector, and thus to help raise per capita incomes in that sector.

To conclude, agriculture can contribute importantly to the development of the nonfarm sector. For it to do this in an efficient way, development resources have to be directed to the sector. The benefits of the development will be widespread in the economy, since they will be realized in large part by consumers and not producers. Moreover, investing in the development of new agricultural technology tends to improve the distribution of income since it is the lower income consumers who tend to benefit the most in a relative sense.

Gross Distortion in the Use of Agricultural Resources Globally

There are currently gross distortions in the use of the world's agricultural resources. These distortions involve gross inefficiencies in global resource use, significant losses in real income on a global scale, and additional demands on the world's underlying resource base which have pervasive deleterious

environmental consequences.

These distortions are rooted in particular patterns of trade and exchange rate policies in the developed and developing countries. The developed countries, especially the United States, the European Community, and Japan, tend to protect their food and agricultural sectors and to set the prices of their principal agricultural commodities above those prevailing in international markets. They do this by means of a variety of domestic commodity programs and protectionist measures set at the border to limit access to domestic markets.

The developing countries, in contrast, discriminate severely against their agricultural sector. They do this by means of a panoply of trade and exchange rate policies, including the overvaluation of national currencies in foreign exchange rate markets (an implicit export tax and an implicit import subsidy), the imposition of explicit export taxes, quotas and embargoes on exports, and a wide variety of export licensing schemes which restrain exports. The consequence of these policies is to dam domestic production up in the domestic market, while at the same time subsidizing the imports of food. The result is to push domestic prices for the affected commodities significantly below those prevailing in international commodity markets.

The combination of these two sets of policies results in a

gross inefficiency in the use of the world's agricultural resources. Far too much of the world's food and agricultural output is produced in the developed countries, while far too little is produced in the developing countries. Inefficient resource use results in the sacrifice of income on a global scale and slower rates of economic development for everybody. Inefficient resource use also increases the demand against natural resources to produce a given level of output, thus contributing to global environmental problems.

We thus see that all nations could well invest substantial resources in an effort to reduce and eliminate these distortions in resource use. The United States took this as an objective and made it a cause celebre in the current Uruguay Round of Multilateral Trade Negotiations. At the time of this writing it appears that that effort has been a failure. In the interest of feeding the world's population and of promoting economic development generally, this objective should be pursued in other fora, and on a persistent basis.

The Disparity in Per Capita Incomes Between the Agricultural and Nonfarm Sectors

An important feature of economic development in almost all countries is a chronic disparity in per capita incomes between the agricultural and nonfarm sectors. Per capita incomes in

agriculture tend to lag behind those in the nonfarm sector. In the developed countries the disparity tends to be no larger than 10 to 20 percent. But in the developing countries, average per capita incomes in the nonfarm sector tend to be two or three times larger than those in the agricultural sector. This disparity contributes importantly to the very unequal distribution of income in these countries.

This tendency of incomes in agriculture to lag behind those in the nonfarm sector is rooted in the character of demand and supply for agricultural commodities, and in the failure of development policies in almost all countries. As noted in an earlier section of this chapter, it is the nature of the structure of demand that over time labor needs to be transferred from agriculture to the nonfarm sector. The way this is done in a market economy is for wages to be higher in the sector of the economy that needs to attract resources and lower in the sector that is supplying the resources. If agriculture is developed by means that introduce modern technology into the sector with its productivity-enhancing effects, the adjustment problem will be exacerbated and the income disparity will tend to be larger. That there is a chronic need to adjust labor out of agriculture if the development process is to proceed is why this income disparity tends to persist.

Unfortunately, rather than to facilitate the adjustment

process by policies that make migration easier, governments - and especially those in the developing countries - tend to ignore the adjustment problem. They underinvest in the education and training of their rural population, investments which would help to make labor more mobile. Moreover, they underinvest in the physical infrastructure for rural areas, making it unattractive for nonfarm activities to locate in rural areas and thus to provide expanding employment opportunities in areas close to the source of the potential migrants. These failures of economic policy are made worse by the tendency of developing countries to discriminate against their food and agricultural sectors by shifting the domestic terms against them.

These failures to invest at appropriate levels in the population of the rural population causes the production potential of this population group to be lost. Reversing these policies can contribute importantly to accelerating the growth process and to raising per capita incomes generally in the economy.

Poverty and Hunger

An important share of the world's population suffers from malnutrition and hunger. While the share of the global population which finds itself in this state has declined over time, the absolute number continues to increase, in large part

because of rapid population increases in the developing countries. (See World Bank report.)

Unfortunately, all too frequently the cause of malnutrition and hunger is assumed to be a consequence of inadequate supply, with the result that supply-side solutions to the problem are prescribed. This comes about in part because the hunger and malnutrition problems are defined as a problem of food security. Solutions are therefore proposed in terms of carrying larger stocks, and in terms of pursuing food self-sufficiency policies.

Such policies are misguided, in large part because they have the problem defined wrong. Problems of malnutrition and hunger are not rooted in lack of production. They are rooted in inadequate income and poverty. As Professor Sen noted some years ago, even the most severe famines in history had little to do with inadequate food supplies, but rather with a collapse in the incomes of the affected population groups. In some cases, food prices actually declined at the height of the famine because of lack of effective demand.

The pursuit of food self-sufficiency policies as the means of dealing with the problem of malnutrition and hunger wastes resources and sacrifices economic growth. The evidence for this can be found in the experience of a number of countries, but perhaps most importantly in the experience of India. That

country has had a self-sufficiency goal for a number of years, and during the 1980's attained the goal on a number of occasions. But although technically self-sufficiency was attained, even with the accumulation of stocks and an increase in exports of food, hundreds of millions of Indian citizens remained malnourished and suffering from hunger. The problem is that becoming self-sufficient did little to address the underlying problem of poverty.

The other commonly recommended policy for dealing with the problem of food security, the carrying of larger stocks in the government's hands, similarly wastes resources and government resources. What is seldom recognized in this case is that carrying stocks is extremely costly. Not only does the government have to invest large sums to acquire the stocks, it also has to pay the interest on the resources involved, invest in silos and warehouses to protect the stocks, suffer the losses from insects and deterioration in the stocks, and pay the transportation costs of assembling the stocks. In addition, the management of the stocks is very complicated, and in most cases policy makers do not have adequate information to know when to release the stocks and in what quantities. Mistakes in this regard are once-for-all mistakes and cannot be undone.

A more efficient and effective policy for dealing with problems of food security is to carry additional foreign exchange

reserves. When a shortfall in production occurs domestically due to weather or other disasters, the foreign exchange can be used to import the needed supplies. Shortfalls in agricultural production are seldom generalized on the international scene. Instead, shortfalls in one country or countries are typically offset by production in other countries that is above trend lines. Thus there is usually supplies to be acquired when the need arises. An important side benefit of such a policy is that the additional foreign reserves can be invested in the international capital market and thus earn a rate of return when not being used. This is in sharp contrast to the accumulation of stocks and the tieing up of capital in silos and warehouses.

Addressing the problem of malnutrition and hunger must be rooted in attempts to alleviate and reduce poverty. The solution to that problem is to promote more general economic growth and development. Americans who are properly concerned about the problem of hunger and inadequately fed people should direct their efforts to solving the underlying poverty problem, and not to palliatives that have no lasting effects. Until the underlying poverty problem is solved, targeted feeding programs supported by programs of food aid can help improve the nutritional status of the affected groups.

The Emergence of a Global Food and Agriculture System

The period since the end of World War II has seen the emergence of a well-integrated food and agricultural system. This system is based on international trade, and is a significant accomplishment of the international community.

An important consequence of this system is that famines have virtually disappeared from the face of the earth in this period. Shortfalls in production in one part of the world have been offset by increases in production in other parts of the world. The disparities have been leveled out by means of international trade.

The exceptions to this general rule occur when for whatever reason governments do not want the international community to know they are experiencing a problem, or let the problems be known only when it is too late to deal with the logistical problems of getting adequate supplies to the affected groups. The starving babies we have seen on television in recent years are a consequence of just such policies. Lack of available supplies were not the problem. The problem was that policy makers in the affected countries did not want the world to know there was a problem.

This global food and agricultural system is still far from perfect. As noted in an earlier section, there are still significant barriers to trade which limit the transfer of food and agricultural commodities freely on international markets. But the progress in evolving a well-integrated system has been significant. The challenge is to continue the evolution of the system so that producers have broader access to markets everywhere and consumers have access to supplies on a broader scale. This broadening of the markets will help to create more stable markets and thus make for more efficient use of the world's agricultural resources.

The Emergence of a Global System of Agricultural Research

In addition to the emergence of a global food and agricultural system based on growth in international trade, an international system of agricultural research institutions is gradually emerging as well. An important lynch pin in this system are the thirteen International Agricultural Research Centers created by the international community since the mid-1960s. This system was begun with the establishment of the International Rice Research Institute (IRRI) by the Ford and Rockefeller Foundations. That was later followed by the established of the International Center for Corn and Wheat Improvement (CIMMYT) in Mexico, and a succession of other

centers. These international centers are located strategically in the developing world, with a couple of exceptions, and are currently supported by the international community at a level of $240 million a year.

The developed countries of the world have long had effective systems of agricultural research. These systems have contributed importantly to the modernization of agriculture in those countries. More recently, the developing countries have begun to recognize the importance of having a domestic research capacity to produce new production technology for their producers. Agricultural research systems still tend to be sorely underdeveloped relative to the needs in these countries, however.

In addition to these various systems of agricultural research institutions, there are growing links among the various components. Although the IRRI and the CYMMIT are responsible for creating the miracle rices and wheats, respectively, an important mission of the international research centers is to work with the research systems in the developing countries and to help them develop their capacity.

The U.S. agricultural research system, under the auspices of the Board for International Food and Agricultural Development, has also begun to forge important linkages with researchers in the developing countries. These linkages, known as CRSPs, link

researchers in U.S. agricultural research centers with researchers in the developing and other countries. The result has been the development of significant new production technologies. Somewhat unexpectedly, this system has also resulted in the training of significant numbers of scientists for the developing countries. It has also resulted in significant transfers of new technology from other parts of the world back to the United States for the benefit of U.S. producers. In sum, it is an example of international cooperation and collaboration at its best.

There is much to be done to further develop this system. In the first place, the capacity for social science research in the system is extremely limited. Consequently, the crushing social problems in the developing countries go largely undiagnosed. In addition, there is limited capacity to analyze and evaluate the effects of economic policies that could promote more rapid rates of economic development.

In addition, given the location-specificity of agricultural technology, an effective agricultural research station is needed for each ecological region of the world. We are far from having such a system. We are also far from having the various components of the system linked together so as to share knowledge and exchange information for the benefits of humankind. Until the emergence of the CRSPs, the U.S. system for capturing the

benefits of R & D in other parts of the world were sorely inadequate. The system now in place is only a start on what is eventually needed.

Concluding Comments

The global food and agricultural system is truly becoming internationalized. Much progress has been made in linking up the food and agricultural sectors in national economies with each other, and important components of a global agricultural research system are now in place. However, barriers to trade are still a prominent feature of the international system, and significant efforts and investments are still needed to develop an adequate system to produce sustained improvements in the technology for a modern agriculture. The institutional capacity for social science research and for policy analysis is also sorely inadequate at the international level, especially at the state, province, or local level

Per capita incomes in the agricultural sector persistently lag behind those in the nonfarm sectors, contributing to very unequal distributions of income and the sacrifice of significant amounts of output. In addition, most countries are characterized by massive poverty in their agricultural sectors, largely associated with low levels of productivity. Finally, malnutrition and hunger are still far too pervasive on the

international scene, especially in light of the fact that we know how to eliminate it and would have the resources to do it if the political will to do it could be mustered.