

PN-ABH-758  
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## **THIRD WORLD: CUSTOMERS OR COMPETITORS?**

A Source Book on Agricultural Development and Trade

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August 1987

## Preface

The existence of widespread hunger in developing countries, even in time of global surplus, has puzzled and frustrated Americans for decades. In the 1980's, this subject has assumed a new dimension with the decline in U.S. exports of farm products and the growing fear among farmers that current and future markets may be threatened by Third World competition. This has become a policy issue with some agricultural groups who are critical of U.S. and international lending and development assistance. This background paper is intended to help media, farm leaders, educators and other rural Americans in their understanding and discussion of this issue.

The U.S. Congress has directed the Agency for International Development to undertake a Development Education Program to help the American public become more aware of the political, social, and economic impact of hunger and malnutrition. "Third World: Customers or Competitors?" was prepared as part of a project funded by an A.I.D. grant as authorized by Public Law 96-533.

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### Sections:

1. Introduction: The Issue. Agricultural assistance to Third World countries is increasingly a political issue among U.S. farm groups and legislators who believe that such aid is creating new competition and undercutting American farmers in the international market.
2. The Changing World Market. In 5 years, U.S. agricultural exports have declined 40 percent in value. Western Europe and Japan no longer provide growth markets, while Soviet bloc markets are volatile and political. Exports to the Third World, however, represent an increasing share of U.S. overseas business.
3. The Third World. Developing countries, faced with continued hunger problems and growing populations, hold enormous promise as markets -- but only if they have money to buy. Their potential can be realized only with income growth, which in most poor countries will require improvement in agriculture.
4. Developing Countries as Competitors. A number of U.S. farm spokesmen, concerned about export declines and a severe depression in agriculture, have criticized some U.S. and international development assistance as a misuse of taxpayers' money. This complaint has led to political and legislative action.
5. Developing Countries as Customers. Pro-development people respond that Third World countries are the future growth market and that U.S. farmers should support the agricultural assistance that is necessary for incomes to rise. Improved diets in those countries actually stimulate food imports.
6. The Tech Revolution. Rapid progress in agricultural science has created concern among farmers that the world is in permanent food surplus and that U.S. technology transfer is responsible. Other voices are more conservative, pointing to demand growth, population increase, and the slow nature of change in traditional farming.
7. The Policy Choices. With the developed industrial economies unlikely to provide rapid market growth in the future, U.S. agriculture has only two realistic choices: Make further sharp reductions in planted area or look for new customers among the growing economies and populations of the Third World.
8. Research Studies: A Summary. More than a half dozen studies have demonstrated that agricultural improvement in poor countries usually leads to growth in demand for food imports. While there may be short-term exceptions, such development is generally beneficial to U.S. agriculture because it creates new markets.
9. Country Examples. In most rapid-growth countries, agriculture is fundamental to economic transition. Brief case studies summarize the experience of three countries that are now in the "top 10" U.S. markets and three that are often portrayed as "lost markets" because of misplaced U.S. assistance.

## 1. INTRODUCTION: THE ISSUE

A growing political issue in American agriculture is whether developing countries should be regarded as customers or competitors. For a decade, those countries have provided markets for one-third or more of U.S. agricultural exports. That share is projected at 43 percent in 1987. Yet many American farmers and their leaders, faced with declining markets and a severe price and income depression, regard developing countries as more a problem than a solution.

Most of this country's trading partners are competitors to some degree as well as customers. But in the case of developing countries, there is a perception that competition is the principal result of developmental and technical assistance provided by the United States and by international organizations supported by the United States. Some Americans see this assistance as a factor, perhaps the principal factor, in a 40 percent decline in U.S. agricultural exports since 1981. They cite the emergence of Brazil and Argentina as agricultural exporters and criticize the Federal agencies and the land grant universities for their role in the transfer of technology to developing countries.

A page one story in the Washington Post of June 25, 1985, reported on an interview with the American Soybean Association: "South American growers use the best agricultural technology developed here.... The irony that may hurt the most, in the view of ASA, is the research being financed by the State Department's Agency for International Development to spur soybean production in countries competing with the United States" (Sinclair, 1985).

At the same time, many U.S. farm leaders recognize that the greatest opportunity for future export growth lies in the developing world. George W. Stone, President of the National Farmers Union, said in July 1983 that, "It is the lesser developed countries which offer the best

long term hope for a steadily expanding agricultural market" (Stone, 1983). Then-Secretary of Agriculture John Block echoed that theme in October 1983, arguing that "developing countries are the market of the future and that assistance to their agricultural economies will benefit U.S. farmers" (Block, 1983). More recently, Secretary of Agriculture Richard Lyng told the House Agriculture Committee on March 31, 1987, that Third World countries "are the place where we're going to have to look to expand exports."

Proponents of Third World development argue that traditional markets can no longer be expected to provide the engine for U.S. export growth. Western Europe and Japan are mature markets, already well fed, and growing quite slowly in population. Thus, they say, U.S. agriculture must look to other markets -- the developing countries of the Third World. The need is there. The people are there -- three-fourths of the world's consumers. And 94 percent of global population growth between now and year 2000 will take place in developing countries. Thus the growth opportunity lies with developing countries -- but only if they have the money to buy.

Therefore, pro-development people argue, American farmers should favor programs that generate economic development and income growth in Third World countries. In most poor countries, that means improved productivity in agriculture. Economic development usually must include agriculture because in those countries most of the population and most of the poverty are in rural areas.

It is at this point that the argument begins: Many farmers believe agricultural development abroad can only result in lost markets and more competition for U.S. farm products. In a time of large budget deficits and severe economic stress at home, they question the expenditure of U.S. tax money to support such programs through U.S. agencies or the international organizations.

Lee Egerstrom of the St. Paul Pioneer Press summed up that argument in an article August 11, 1986: "From the nearly idle port of Duluth to a

soybean farm in Iowa, a new popular cry for protectionism is being heard throughout the Upper Midwest. Stop the technology transfer that helps developing nations increase food production. Stop the economic assistance and development aid that is going on in the Third World to improve agricultural systems" (Egerstrom, 1986).

Lauren Soth, in the Des Moines Register of March 9, 1987, wrote: "Politicians often are tempted to play on the fears of American producers that foreign aid will build up competition for them and hurt their businesses. Farmers have become more sophisticated about international trade than folks who are not involved in trade. But even they may be induced to listen to the politicians who attack foreign aid on this ground" (Soth, 1987).

A number of research studies have now concluded that economic development and income growth produce a result that is quite different from that feared by many American farmers. A number of studies have found that economic development and income growth generate new demand for more and better and different foods beyond the produce of the country's own agriculture. This creates new markets for American farmers, as reported in studies by the Department of Agriculture, the University of Illinois, the University of Minnesota, the International Food Policy Research Institute, the Curry Foundation, and other research groups and think tanks.

These and other studies support the view that, while a country may become self-sufficient in the narrow biological sense of being able to survive on its own, it is not likely to become self-sufficient in a market sense. It has been demonstrated in Japan, Brazil, Korea, Taiwan, and other countries that as incomes grow, the demand for imported food will also grow. The United States, for example, has the ability to grow far more food than its people must have to exist. Yet in 1986 this country imported \$20 billion worth of farm products. Thus economic assistance and U.S. export expansion are not mutually exclusive policy objectives. They are mutually supportive.

## REFERENCES

### Development as a Policy Issue

It is the lesser developed countries which offer the best long term hope for a steadily expanding agricultural market. We have already witnessed in recent years a tremendous surge in sales to developing countries. Exports to the Third World soared from \$2.6 billion in 1971 to \$17 billion in 1981. P.L. 480 can continue to play a key role in assuring that the U.S. will have a strong share of this important market.

- - George W. Stone, President, National Farmers Union, before the Commission on Security and Economic Assistance, Washington, D.C., July 11, 1983.

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There are those who believe that helping the agricultural economies of the developing countries will increase competition and hurt U.S. producers. Nothing could be further from the truth. Studies by USDA, the World Bank, and others show that as a nation's economy strengthens and its foreign exchange earnings rise, a top priority is almost always more food, better food, and improved food security. In other words, there is more demand for what the U.S. farmer has to offer. Developing countries are the market of the future.

- - Secretary of Agriculture John R. Block, testimony before the Agriculture Committee, U.S. House of Representatives, October 25, 1983.

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For instance, in the soybean oil case, the United States provided its competitors with technical aid through other programs. An Agency for International Development program even financed programs to spur soybean production in other countries, while U.S. agricultural research is readily available to foreign farmers.

The American Soybean Association's John Baize contended that Brazil and Argentina have encouraged oil development to the detriment of their own farmers. In a recent report to ASA members, Baize said that the effect of the higher tax on soybeans is to lower the internal price to farmers, giving processors beans "priced well below their value on the world market."

- - Ward Sinclair, "U.S. Farm Program Goes Awry: The Third World Recipients Flower Into Cost-Cutting Competitors." Washington Post, June 24, 1985.

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But have the Vernon Ruttans of the world helped Upper Midwest farmers and their trading merchants with sage economic advice and market development theories, or have they actually hurt the area economy by helping create competitors for our markets abroad?

From the nearly idle port of Duluth to a soybean farm in Iowa, a new popular cry for protectionism is being heard throughout the upper Midwest.

Stop the technology transfer that helps developing nations increase food production. Stop the economic assistance and development aid that is going to the Third World to improve agricultural systems.

- - Lee Egerstrom, "Blame for hunger misdirected at economists," St. Paul Pioneer-Press, August 11, 1986.

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Politicians often are tempted to play on the fears of American producers that foreign aid will build up competition for them and hurt their businesses. Farmers have become more sophisticated about international trade than folks who are not involved in trade. But even they may be inclined to listen to the politicians who attack foreign aid on this ground. Recently, a few farm leaders complained about a proposed World Bank loan to Argentina that might be used to spur its exports of corn. Soybean growers and processors have objected to aid for palm- and coconut-oil growers.

But farm leaders who look beyond the next harvest understand that America's interest calls for greater economic development the world around. Restrictions on trade and timidity in helping the less-developed will harm all of us.

- - Loren Soth, "Politicians Had Better Wise Up to Interests of Farm Constituents," by Loren Soth, The Des Moines Register, March 9, 1987.

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Spending public money for foreign aid has long been unpopular with lots of Americans. Spending it for agricultural assistance abroad is especially unpopular nowadays with U.S. farmers and many agricultural organizations. Their view is that more foreign agricultural development is simply another threat to our dismal farm export markets. The argument is that we teach them how to grow commodities that we are good at producing ourselves. Then they do it and replace our exports, leaving American farmers holding the bag.

- - J. P. Houck, "A Note on the Link Between Agricultural Development and Agricultural Imports, Staff Paper 82-26 (Department of Agricultural and Applied Economics, University of Minnesota, St. Paul, July 1986).

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## 2. THE CHANGING WORLD MARKET

### Trends in U.S. Agricultural Exports

The decade of the 1970's was a period of unprecedented growth in U.S. agricultural exports -- from 60 million tons valued at \$7 billion to 160 million tons valued at almost \$44 billion. U.S. cropland devoted to exports grew from 72 million harvested acres in 1970 to 137 million harvested acres in 1980. Exports came to account for two-fifths of U.S. harvested cropland and a fourth of farmers' income. Farmers came to expect continued growth in their export market.

In the past five years, however, U.S. agricultural exports have declined 40 percent in value, a major factor in the depression that grips agriculture and threatens the welfare of rural America. Since the 1981 peak, the volume of agricultural exports has declined from 160 million tons in fiscal year 1981 to 110 million tons in 1986. In those five years, export tonnage of wheat declined 40 percent, feed grains 48 percent, cotton 59 percent, and rice 25 percent. The volume of soybeans and soybean products exported dropped 20 percent from the high recorded in 1982.

There are abundant reasons for the export decline: world recession, large global supplies, a strong U.S. dollar, and vigorous and sometimes unfair competition from other exporting countries. Nevertheless, the decline raises the question whether production for export will continue to be a growth element in the U.S. farm economy.

### Western Europe and Japan

Since World War II, U.S. export promotion has focused on the industrialized countries as markets. In recent years, the United States has sent 45 percent of its agricultural exports to Western Europe and Japan

and 20 percent to other developed countries. These nations are not likely to be leading growth markets in the years ahead. They will continue to be important to U.S. agriculture, but they do not offer the potential for market expansion that they provided in the 1970's (Mackie, 1983).

The continuing U.S. trade quarrels with the European Community and Japan are a reflection of this leveling off of trade prospects with those markets. The issues are significant in themselves, but the underlying problems are still more important:

(1) The European Community has sharply expanded its production of grains and many other farm commodities, becoming increasingly protectionist against imports and increasingly active as an exporter itself in competition with the United States. Notwithstanding the uneconomic character of E.C. policies that created this situation, it is clear that the Community is stagnating as a market for U.S. farm commodities.

(2) Japan, on the other hand, will continue to be a net importer of farm products by a wide margin. But Japan, a fully developed economy with high per capita food consumption levels, is not likely to grow as a market in coming years at the pace of the 1970's. Also, as a matter of policy, the Japanese government will resist shrinking a domestic agriculture that already provides less than 50 percent of the nation's caloric intake.

Experience of the past 5 to 6 years shows these market changes dramatically. U.S. agricultural exports to Western Europe declined by 45 percent between 1980 and 1986, and sales to Japan fell 24 percent after peaking in 1981. Recession in Europe and large global production were factors. But the larger problem for U.S. farmers, with respect to the future, is that Japan and West European countries are considered mature markets where per capita food consumption is not likely to rise substantially.

## The Soviet Union

The Soviet market, a major factor in the growth of U.S. agricultural exports in the 1970's, is highly affected by a variable climate and by political relations between the two countries. A minor factor in U.S. agricultural trade in the years preceding 1972, the Soviets became a major purchaser of U.S. grains that year with purchases of 14.1 million tons of grain. The reasons were more political than economic: (1) U.S.-U.S.S.R. relations had improved somewhat from the Cold War period that followed World War II; (2) the U.S.S.R. government made a political decision to increase livestock and poultry production to meet a goal of more animal proteins in the diets of the Soviet people.

During the 1970's Soviet purchases of U.S. grain exceeded 14 million tons in four different years; the value of U.S. agricultural sales to that country rose to \$2.1 billion in 1979. With the U.S. embargo of grain exports to the Soviet Union in early 1980, however, U.S. agricultural sales to that market declined to \$1.5 billion in 1980 and \$1.7 billion in 1981. After the embargo was lifted in 1981, U.S. sales to that market rose again -- to above \$2.5 billion in 1984 and 1985 -- but declined to \$1.1 billion in 1986.

Eastern Europe seemed to show great promise as a market for U.S. products in the 1970's, rising to \$2.4 billion in 1980 and \$2.1 billion in 1981. But economic problems and political difficulties with the U.S. brought a sharp decline beginning in 1982. U.S. farm sales to that bloc are now around \$0.5 billion.

## Developing Countries

In contrast, the share of U.S. agricultural exports going to developing countries has increased -- from 19 percent in 1970 to 39 percent in 1981 to 41 percent in 1986. The value of U.S. shipments to developing countries rose from \$1.1 billion in 1970 to \$16.9 billion in 1981, but

declined to \$10.7 billion in 1986, affected by the general decline in U.S. agricultural exports.

The U.S. Department of Agriculture projects 1987 farm exports to developing countries at \$11.8 billion -- a rise of 10 percent over the preceding year. According to these projections, the share of U.S. agricultural exports going to developing countries will rise to a record 43 percent in 1987. With total U.S. agricultural exports expected to rise 5 percent in value and 16 percent in volume compared with 1986, developing countries markets are primarily responsible for those gains (U.S. Department of Agriculture, 1987).

China, which USDA does not include in its summary of "less developed" country trade, is also projected to increase as a U.S. farm customer in 1987. This increase, a doubling of sales from the low level of 1986, grows out of China's resumption of wheat and corn purchases from the United States (See Table 1).

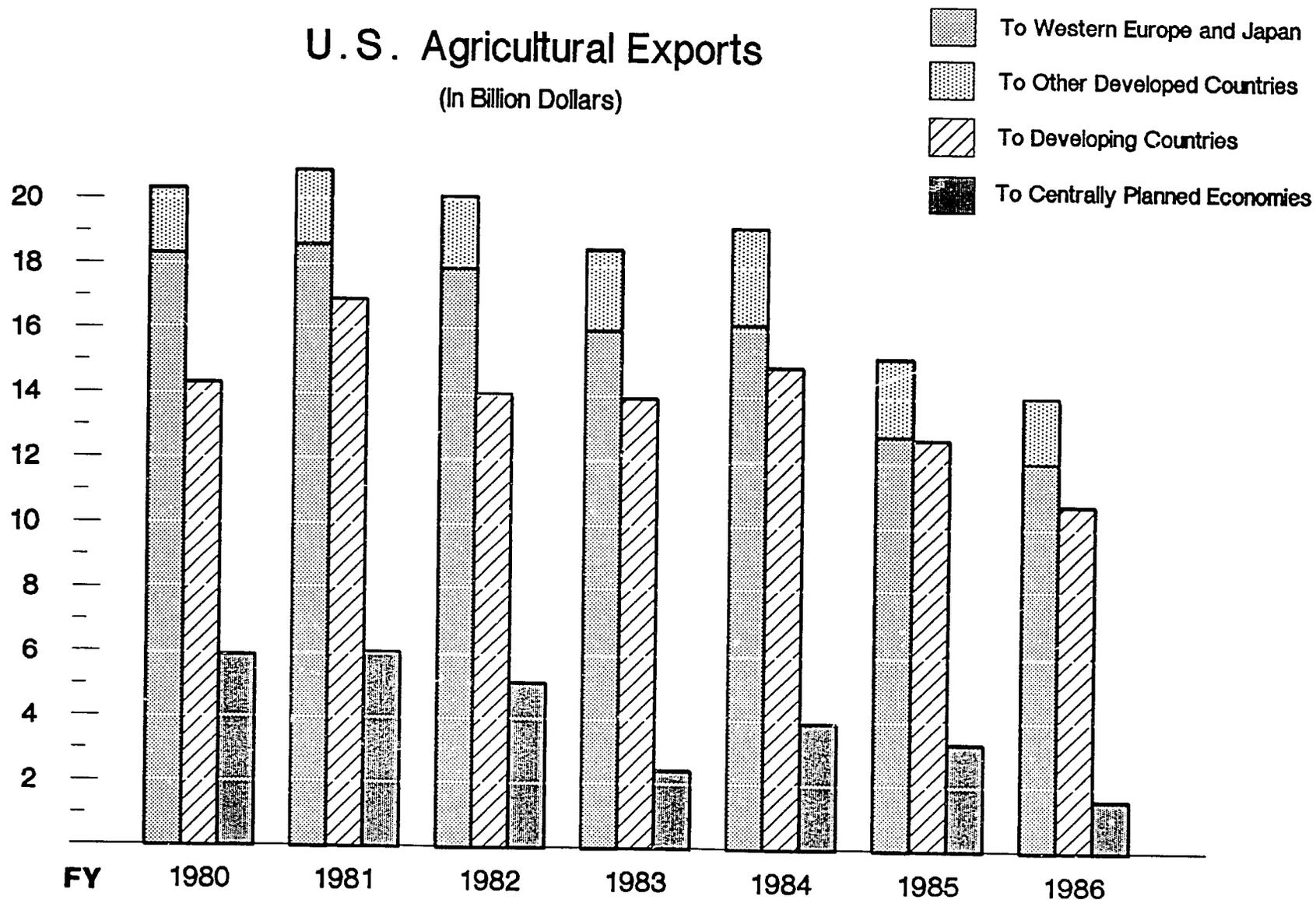
Table 1. U.S. Agricultural Exports to Selected Destinations, Fiscal Years 1980-1987

	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987 (Est).</u>
	<u>\$ Billions</u>							
Western Europe	12.5	11.8	12.2	10.1	9.3	7.2	6.9	6.8
Japan	5.8	6.7	5.7	5.9	6.9	5.7	5.1	5.5
All Developed Countries	20.3	20.9	20.1	18.5	19.2	15.2	14.0	14.2
Less Developed Countries (Not Including China)	14.3	16.9	14.0	13.9	14.9	12.7	10.7	11.8
China	2.0	2.2	1.8	.5	.7	.2	.1	.2
Soviet Union	1.5	1.7	2.3	1.0	2.5	2.5	1.1	.8
Eastern Europe	2.4	2.1	.9	.8	.7	.5	.4	.5
All Destinations	40.5	43.8	39.1	34.8	38.0	31.3	26.3	27.5

Source: Foreign Agricultural Service, USDA, May 27, 1987

# U. S. Agricultural Exports

(In Billion Dollars)



Source: USDA, Outlook for U. S. Agricultural Exports, May 27, 1987  
 (Note: USDA includes China among "Centrally Planned Economies")

## REFERENCES

### Developed Countries

The expansion of export markets became a key element of U.S. farm policy in the seventies; no doubt, it will remain a central feature of the decade ahead. The demand of the world's more prosperous nations for food products is reaching saturation from the U.S. farmer's standpoint. Incomes in most of these countries are high, and consumers can be expected to spend a smaller portion of their additional income on food. Moreover, population growth has slowed sharply in the developed countries. High-income, developed countries currently account for about 50 percent of all U.S. agricultural exports, while the developing countries account for about one-third, and the centrally-planned countries account for the remainder.

- - Arthur B. Mackie, "The U.S. Farmer and World Market Development," U.S. Department of Agriculture (ERS), October 1983.

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### Developing Countries

Further, what choice do U.S. farm exporters have? Since developing country markets will soon be the only growth markets available to them. U.S. farm producers cannot afford to ignore the policies required to promote the mutually beneficial expansion and exploitation of these markets.

- - Robert L. Paarlberg, "Developing Country Farm Production and Farm Exports: The Decisive Role of Policy," Consortium for International Cooperation in Higher Education, March 1987.

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The developing countries are expected to experience an even stronger upturn in 1987 -- expanding at a 2.5 percent rate compared with only 0.8 percent in 1986. In addition to the "locomotive" effect of stronger growth in industrialized country markets, prospects are better because of an improved international lending environment. Oil exporters will have weathered the worst impact of the previous year's halving of petroleum prices by 1987. Oil importers will also benefit from these lower prices, and from lower interest rates in 1987. LDC debtor nations will benefit from a lessening of the tensions that accompanied the serious current account problems faced by Mexico and Nigeria in the wake of plummeting oil prices. Mexico's successful bargaining for more flexible financing arrangements and Nigeria's willingness to pursue new exchange rate policies eased 2 of the sharpest points of possible debtor-lender conflict, recently opening the doors for further lending there and elsewhere in the developing world.

- - "Outlook for U.S. Agricultural Exports, U.S. Department of Agriculture, May 27, 1987.

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### **3. THE THIRD WORLD**

#### **Who Are They?**

A number of terms are used more or less synonymously to identify the low and middle income nations, including: Less or lesser developed countries (LDCs), developing countries, under-developed countries, and Third World countries. "Third World" is a term of French origin used to differentiate these countries from the industrial economies and the industrial non-market (Communist) countries. "LDC's" is the shorthand term used most commonly by scholars and development professionals.

The World Bank defines 96 nations as developing countries -- 36 low income countries (average per capita income GNP below \$400) and 60 middle income countries. These countries include all of Asia except Japan, and all of Africa and the Middle East except for Israel and the high-income oil exporters.

China is generally considered to be a developing country. However, U.S. Department of Agriculture export numbers exclude China from the "less developed" group, lumping it for statistical purposes in a category entitled "centrally planned economies" (Communist countries). The Population Reference Bureau includes Chinese statistics in the "less developed" category. Similarly, World Bank statistics include China in the "developing" group.

#### **Population**

Data from the Population Reference Bureau show that the less developed countries have 76 percent of the world's population. Ninety-four percent of world population growth in the next 13 years will take place in those countries. Less developed countries are projected to grow from 3.84 billion people in mid-1987 to 4.90 billion in the year 2000 and 6.66 billion in 2020 -- increases of 28 percent and 74 percent.

Unfortunately, population growth is not the same as market growth. People do not make a market unless they can buy and sell. The developing countries have to expand their economies and generate income growth if they are to eat better and live better. And they face many obstacles, political and economic.

### Third World Economies

In the first half of this decade, economic growth slowed throughout most of the developing world, and per capita incomes declined in many countries. At the low point of the global recession, 1982-83, gross domestic product grew by only 2.0 percent in real terms, according to the World Bank. There has been some improvement since that time, but for all Third World countries, the 1980's have been a period of adjustment to a rapidly-changing world economy.

Agriculture is the basic industry in most Third World countries, employing most of the labor force and providing a large part of the national product. For many developing countries, therefore, a healthy farm economy is essential to long-term development. Many developing countries have experienced rapid growth in agricultural output since 1970, based in large part on new wheat and rice varieties developed as part of the so-called Green Revolution.

Others, especially Africa, have benefitted scarcely at all from these improvements. And in most developing countries, large numbers of people remain hungry and malnourished. It is not possible to estimate precisely the chronic malnutrition in developing countries, but there is no question that the problem is vast.

### The Food Problem

A decade after the world food scare of 1974, the number of hungry and malnourished people in the world has not substantially improved. The Food and Agriculture Organization of the United Nations estimates that in 1985 some 512 million people suffered from hunger and the effects of

malnutrition in developing countries other than China. That estimate, defined as the number "chronically deprived of the food needed to enjoy an active, healthy life," represents an increase of 37 million between 1980 and 1985. In contrast, the estimated increase in the 10 years between 1970 and 1980 was 15 million, indicating that the rate of growth in absolute numbers of poorly fed people has actually quickened in the 1980's (Lewis, 1987).

Other organizations see the problem as even larger in scope, based on different definitions and methodology. The Overseas Development Council, for example, says that at least 750 million people live in absolute poverty. The World Bank, in a paper published in 1986, placed the number somewhere between 340 million and 730 million people, not including China. The President's Task Force on International Private Enterprise concluded in 1984 that in developing countries "rapid population growth and the need to improve the diets of millions of people create rising demands for the most basic human need -- food" (President's Task Force, December 1984).

It is important to view this chronic food problem as distinct from emergency situations such as the recent crisis in Africa and from longer-term "Malthus-type" fears that population will outrun the world's ability to produce food. The current food problem in developing countries has little to do with any prospect of global food shortage; it has everything to do with the ability to buy. People are hungry and malnourished because they are poor.

**Development Needs**

For food exporting countries, therefore, the question is how to create new markets in countries where poverty is the governing factor in food-purchase decisions. This calls for strategies, not only to increase food production substantially in the poor food-deficit countries, but also to increase rural and urban incomes through economic development. In most countries, this requires agricultural development. When most of a nation's people and most of its poverty are concentrated in rural

areas, agricultural improvement is essential to generate income growth and an expanding demand for industrial products.

Certainly, a strategy to increase incomes of poor people cannot ignore a country's farmers if those farmers make up 50 to 70 percent of the national work force and an even larger share of the country's poor. For most low income countries, moreover, agricultural improvement is the most effective means of achieving rapid economic development and income growth. Agricultural development not only helps directly to meet food needs, it increases farm income, stimulates farmer buying and local business, generates a labor surplus, and finally, fosters new tax revenues as well as savings and investment.

The developing countries have increasingly recognized the need for their governments to actively further agricultural and rural development. Their efforts are especially significant in agricultural research, extension, improvement of rural infrastructure, and measures to strengthen farmer incentives. International aid, both bilateral and multilateral, now amounts to around \$10 billion a year for agricultural and rural development.

### The Need to Develop Agriculture

It is often argued that foreign development assistance should be limited to non-agricultural projects, and in fact poor countries have too often neglected agriculture in favor of costly "prestige" projects. But in recent years, many developing countries have focused new attention on the farming sector -- and with good reason.

The 34 countries classified by the World Bank as low income countries had 70 percent of their labor force engaged in agriculture in 1980. The 39 lower middle income countries employed 56 percent of their labor force in agriculture. And the 21 upper middle income countries had 29 percent of their workers in agriculture. In contrast, the 19 industrial market economies had an average of only 7 percent of their labor force in agriculture, and in the United States the proportion was 4 percent.

It is equally dramatic to compare the degree to which agriculture predominates in the national output of the poor countries. The low-income countries obtain an average of 36 percent of their gross domestic product from agriculture, and the lower middle income countries look to agriculture for 22 percent of the GDP. The proportion for upper middle income countries is 10 percent, and for industrial market economies only 3 percent. In the United States, agriculture accounted directly for only 2 percent of GDP.

Typically, as a country moves up the income scale, it employs a smaller share of its labor force in agriculture and depends on agriculture to provide a smaller share of its national product. As its agriculture becomes more productive and incomes increase, an expanding urban population can afford to buy a wider variety of products and services created in a growing non-agricultural sector.

All of this supports the proposition that in most countries agricultural improvement is essential to a high income strategy of development. Agricultural development is needed not only to reduce and eliminate hunger and malnutrition, but also to stimulate economic growth and increase incomes both in agriculture and in the non-farm economy. According to the World Bank, "there are strong links between agriculture and overall economic growth. Few countries have achieved sustained economic growth without first, or simultaneously, developing their agriculture" (World Bank, 1982).

## REFERENCES

### Poverty the Basic Problem

Poverty is the basic cause of hunger today. Most of the world's malnourished people have neither the land to grow their own food nor the money to buy it -- even in the years when local bumper crops are harvested, total world production is high, and storage bins are filled to overflowing. According to the World Bank, approximately 800 million people in the non-Socialist developing world live in such absolute poverty that they cannot provide themselves with even a minimally adequate diet. This massive poverty explains the paradox that even doubling food production next year on present patterns would not materially change the status of the great majority who are hungry and malnourished today.

- - "Overcoming World Hunger: The Challenge Ahead," Report of the Presidential Commission on World Hunger, Washington, D.C., 1980, P.19.

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Although producing food is essential, it is not an adequate solution to the plight of hungry people. At the root of the hunger problem is insufficient income -- the poverty of both small producers and consumers. Even if production of food increases, many people in the developing world cannot afford to buy it.

- - Martin McLaughlin, "World Hunger or Food Self-Reliance? A U.S. Policy Approach for the 1980's." Development Paper 33, Overseas Development Council, May 1982.

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The developing world today faces an economic crisis of major proportions and will continue to experience serious difficulties throughout this century. Rapid population growth and the need to improve the diets of millions of people create rising demands for the most basic human need -- food.

Abundant global cereal stocks and low world prices should set the stage for a reversal of declining per capita consumption in medium and low-income importing countries. But, because of severe limitations on the ability of developing regions to finance needed purchases, record high cereal supplies remained out of the reach of many of the poorest countries.

- - The President's Task Force on International Private Enterprise: Report to the President, December 1984, p. 139.

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The often-predicted Malthusian nightmare of population outstripping food production has never materialized. Instead, the world faces a narrower problem: many people do not have enough to eat, despite there being food enough for all. This is not a failure of food production, still less of agricultural technology. It is a failure to provide all people with the opportunity to secure enough food -- something that is very hard to do in low-income countries.

- - "Poverty and Hunger: Issues and Options for Food Security in Developing Countries," World Bank, 1986, P.54.

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The world has made some progress in coping with its food problems over the past ten years, but the achievements are dwarfed by the tasks still lying ahead.

- - Edouard Saouma, Director-General, Food and Agriculture Organization, United Nations, FAO World Food Report, 1983.

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### Agricultural Improvement and Income Growth

As farm families attain larger disposable incomes through increased agricultural profits they can become buyers of goods and services, providing more jobs and higher incomes not only on farms but also in rural trading centers and in the cities. What I am suggesting, in other words, is that the improvement of agricultural productivity is the best route to economic advancement for the agrarian developing countries.

- - Sterling Wortman (Rockefeller Foundation), "Food and Agriculture," Scientific American, September 1976, P. 35.

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This paradox -- of poverty in the midst of plenty -- has long plagued popular understanding of the role of agriculture in economic development. On the one hand, it has led to a sense of hopelessness about the world's malnourished; on the other, to technological overconfidence. Overanxiety about food crises has alternated with taking agriculture for granted, even neglecting it.

There are strong links between agriculture and overall economic growth. Few countries have achieved sustained economic growth without first, or simultaneously, developing their agriculture.

- - World Bank, World Agricultural Development Report, 1982.

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Employment-creating agricultural development is the key to growth in low-income countries. Even in the faster growing countries agricultural progress has usually lain behind the success of manufacturing, as it did in the eighteenth and nineteenth century growth of countries now industrialized.

- - The Brandt Commission, "Common Crisis: Cooperation for World Recovery," 1983. P.20

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A focus on hunger means a primary emphasis on agriculture and rural development. If hunger alleviation is made a focal point of American development assistance, such a concentration implies a concomitant emphasis on agriculture -- but not for the reason that most people believe. Increasing food output is obviously important, especially in those societies with rapidly increasing populations and income. In terms of reducing hunger, however, the employment and income effects of agriculture are much more important than expanded food output per se."

- - Walter P. Falcon, "Reflections on the Presidential Commission on World Hunger," American Journal of Agricultural Economics, Vol. 63, No. 5, December 1981.

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At the 13th ministerial meeting of the United Nations World Food Council in Beijing this month, food and agriculture ministers from more than 30 countries received new estimates suggesting that the problem of hunger and malnutrition in parts of the developing world was getting worse.

According to calculations made by the council and its parent body, the United Nations Food and Agriculture Organization, based in Rome, the number of hungry people in the world grew by 15 million from 1970 to 1980, to some 475 million, a rate of increase of about 1.5 million a year. The world's population is about five billion.

In the early 1980's, however, as economic growth slowed in the industrial nations, increasing the poverty of the developing nations, the pool of hungry people grew at a rate of nerly eight million a year, reaching 512 million in 1985, according to the World Food Council.

- - Paul Lewis, "World Hunger Found Still Growing," New York Times, June 28, 1987.

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#### 4. DEVELOPING COUNTRIES AS COMPETITORS

With American agriculture genuinely hurting from the loss of export markets, there has been increasing criticism of U.S. and multilateral efforts to help Third World countries improve their productivity. Critics of agricultural assistance to other countries believe that U.S. tax dollars are being used to create competition abroad and thus to undercut American farmers in world markets.

Representative Beau Boulter (R-Texas) summarized that argument pointedly in the House of Representatives April 28, 1987: "While American farmers are going through the most difficult times since the Great Depression, their own tax dollars are being used to subsidize their foreign competition." (Boulter, 1987).

Many commodity groups reflect that view:

\* Soybean growers blame World Bank loans for increased competition from Malaysian palm oil and South American soybeans.

\* Fruit and vegetable growers worry about new competition growing out of the Caribbean Basin Initiative.

\* Rice producers complain that international research supported by the United States has created competition from Thailand, Burma, and Pakistan.

\* Cotton growers believe U.S. assistance has generated competition from Mexico and Paraguay.

\* Apple growers worry about the loss of a seasonal market in Guatemala, attributed to American aid.

\* U.S. wheat growers complain that U.S. assistance to the Sudan has discouraged that country from importing wheat.

### Farm and Commodity Organizations

A leader in criticism of this kind is the American Soybean Association, whose industry has traditionally exported half of its crop and at one time (1970) held an 85 percent share of the global market for soybeans and soybean products. But other farm and commodity organizations also espouse that view, as do some media commentators and legislators.

Lee Egerstrom of the St. Paul Pioneer Press summarizes: "The American Soybean Association and its state organizations are particularly critical of U.S. assistance and loans to developing countries. The Wheat Growers, American Farm Bureau Federation and other farm groups recently have joined ranks with the ASA and are pressuring the World Bank, other multilateral lending banks and the State Department's Agency for International Development to restrict lending practices for agricultural development" (Egerstrom, 1986).

Dr. Kenneth Bader, President of the American Soybean Association, says that ASA's position on foreign development assistance is based solidly on the views of its members. "My experience indicates that farmer emotions run high when one talks about giving away U.S. farm technology to our competitors," Bader said. "I'm not saying it's all emotionally rational, but there is definitely concern. For example, the entire ag committee of one state legislature and 10,000 other people signed petitions to USAID to cease and desist supporting projects that were basically transferring agricultural production technology to our competitors" (Bader, 1986).

Economic reporter Stuart Auerbach, in the Washington Post of July 20, 1986 quoted a typical comment from a Kansas farmer: "Look at all the exporting countries that were importing countries a few years

ago. We told them too much and made them direct competitors." He also cited low-cost World Bank loans to improve farming in South American nations such as Argentina and Brazil as a cause of American farmers' export woes. "I'd like a 5 percent loan," he said. "Our dollars go down there to help our direct competitors" (Auerbach, 1986).

The National Association of State Departments of Agriculture, meeting in Chicago September 17, 1986, passed a resolution opposing "the use of any federal money to subsidize foreign agricultural competition and competition of any American industry" (NASDA, 1986). Similar resolutions have been passed by other farm organizations, including the National Cattlemen's Association, meeting in Reno, Nevada, in January 1987.

### Congressional Reaction

A number of farm state legislators, sensitive to constituent concerns, have become critics of development assistance and loans that they think may subsidize competitors.

In December 1985, Representative Bill Emerson (D-Missouri) criticized multilateral lending as well as "direct grants from the Agency for International Development and the Department of Agriculture which serve to help foreign countries improve agricultural productivity." He argued that, "At a time when our budget deficit is burgeoning and our farm economy is sagging, it is beyond me to know why we should be spending taxpayers' money to drum up new competition for our own farmers" (Emerson, 1985).

Senator Dale Bumpers (D-Arkansas) complained in June 1986 that international research partly funded by the U.S. "benefits countries that have reached subsistence level and directly compete against U.S. exports" (Bumpers, 1986). Senator Steven D. Symms (R-Idaho) criticized "our own government's bad policies involving foreign aid" (Symms, 1986). And Senator David Pryor (D-Arkansas) argued that American-funded foreign

assistance programs "play a significant role in our declining exports" (Pryor, 1986).

In a Senate statement February 4, 1987, Senator Howell T. Heflin (D-Alabama) criticized U.S. bilateral assistance to developing countries. "It appears that this Administration will override, many times, the interest of the American farmer. The Reagan foreign aid policy is subsidizing countries that are in direct competition with U.S. agriculture" (Heflin, 1987).

A number of bills have been introduced in Congress to limit U.S. participation in bilateral or multilateral lending projects viewed as fostering competition for U.S. agriculture. In June 1987, nine major U.S. commodity groups joined in a coalition to support the Foreign Agricultural Investment Reform Act (F.A.I.R.), first introduced in 1985. Farm groups represented are the American Association of Meat Processors, the American Farm Bureau Federation, the American Soybean Association, the American Sugarbeet Growers Association, The Fertilizer Institute, the National Association of Wheat Growers, the National Cattlemen's Association, the National Grain Sorghum Producers Association, and Women Involved in Farm Economics.

## REFERENCES

### Complaints from U.S. Producers

My experience indicates that farmer emotions run high when one talks about giving away U.S. farm technology to our competitors. I'm not saying it's all emotionally rational, but there is definitely concern. For example the entire Ag Committee of one State Legislature and 10,000 other people signed petitions to USAID to cease and desist supporting projects that were basically transferring agricultural production technology to our competitors.

- - Kenneth L. Bader, Chief Executive Officer, American Soybean Association, "U.S. Agricultural Interests in the Third World," speech to Food and Agriculture Committee of the National Planning Association, St. Louis, March 21, 1986.

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He (Kansas farmer Cecil Vering) blames hard times on the slowdown of exports. "Look at all the exporting countries that were importing countries a few years ago," he said. "We told them too much and made them direct competitors."

He also cited low-cost World Bank loans to improve farming in South American nations such as Argentina and Brazil as a cause of the American farmers' export woes. "I'd like a 5 percent loan," Vining said. "Our dollars go down there to help our direct competitors."

- - Stuart Auerbach, "U.S. Wheat Industry Hungry for Foreign Sales," New York Times, July 20, 1986.

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Another of our major competitors on the world market is palm oil produced and exported largely by Malaysia and Indonesia. Palm oil competes directly with soy oil in the major vegetable oil markets of India, Pakistan, Europe and the United States. Much of the world production of palm oil is a direct result of World Bank and other multilateral lending agency loans for oil palm production. Even though the world currently has a glut of vegetable oil, we continue to see loans being approved to expand oil palm plantings. It is for this reason ASA supports S. 220, Senators Symms' and Nickles' bill to require the United States to vote against multilateral bank loans for the production of surplus commodities and to reduce U.S. financial commitments to banks that approve such loans over U.S. objections. We urge the Senate to approve S. 220.

- - John Baize, American Soybean Association, Statement before the Senate Agriculture Committee, March 11, 1987.

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Michigan farmers are being hurt by U.S. foreign aid policies that favor foreign agricultural competitors, according to the Michigan Soybean Association. The MSA is urging the U.S. government to redirect foreign aid and loans to the World Bank. The organization says taxpayer funding for these activities is helping increase foreign production of commodities like soybeans that compete directly with U.S. products in world markets.

- - Huron Tribune, "MSA Requests Foreign Aid Redirected,"  
November 11, 1985.

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The American Soybean Association and its state organizations are particularly critical of U.S. assistance and loans to developing countries. The wheat growers, American Farm Bureau and other farm groups recently have joined ranks with the ASA and are pressuring the World Bank, other multilateral lending banks and the State Department's Agency for International Development to restrict lending practices for agricultural development.

In short, the voices are saying we should stop the economists and scientists in their tracks and lock the world's poor and hungry into our markets.

- - Lee Egerstrom, "Blame for hunger misdirected at economists,"  
St. Paul Pioneer-Press, August 11, 1986.

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RESOLVED, The National Association of State Departments of Agriculture, meeting in Chicago, Illinois, September 17, 1986, opposes the use of any federal money to subsidize foreign agricultural competition and competition of any American industry. NASDA also opposes the destruction of the American Farm System by the World Bank or any agency which offers low-interest rates to foreign agricultural entities. A copy of this resolution shall be forwarded to U.S. Secretary of Agriculture and the U.S. Congress.

- - National Association of State Departments of Agriculture, "Subsidizing Foreign Competition," Policy No. MAD-8, September 17, 1986.

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## Congressional Reaction

It is high time we take some action to correct this and I was encouraged when language was added to the Senate-passed farm bill which would require the U.S. representatives to the IMF and other institutions to vote against loan requests that would lead to the displacement of American agricultural exports. If the loans were approved anyway, the U.S. would then withhold a corresponding amount of funding from the institution. Unfortunately, the language was "watered down" in the conference committee so that now only a study of the problem is required. At a time when our budget deficit is burgeoning and our farm economy is sagging, it is beyond me to know why we should be spending taxpayers' money to drum up new competition for our own farmers. This will definitely be a priority item on my agenda in 1986.

- - Representative Bill Emerson (R-Missouri), "Subsidizing Our Own Competitors," Regional Farmer, December 18, 1985.

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Approximately 90 percent of the world's rice is produced in Asia and four Asian countries -- Thailand, Burma, Pakistan and the PRC -- are major rice competitors with the United States. Yet, United States AID awarded a \$12.3 million grant to the International Rice Research Institute in the Philippines to support research in production programs on the rice plants for the developing world.

If the research was limited to developing nations trying to maintain subsistence farming in rice production to feed their people, the U.S. assistance would be beyond reproach. But world rice production has nearly doubled since 1960, mostly due to higher yields. The fact is that this research also benefits countries that have reached subsistence level and directly compete against U.S. exports.

- - Senator Dale Bumpers (D-Arkansas), "The Agency for International Development Research Grant," Congressional Record -- Senate, June 6, 1986 (S. 7028)

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For far too long the agriculture producers of our Nation have been the object of our own Government's bad policies involving foreign aid. It is one thing to assist a neighbor, but it is an entirely different thing when we help our neighbors at our own expense. By adopting this and similar measures, such as the Foreign Agricultural Investment Reform, or F.A.I.R. Act, many of the holes in our agricultural economy can be plugged up.

- - Steven D. Symms (R-Idaho), Congressional Record -- Senate, June 26, 1986 (S.8716).

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Agriculture exports are important not just to the farm economy but to the economy of our nation as a whole. For years, they represented the only bright spot in our balance of trade.

While many factors have contributed to this decline, there is no doubt that the American-funded foreign assistance programs, such as the low-interest loans of the World Bank and the International Monetary Fund together with AID programs have financed the development of overseas competition for our own American farmers and do play a significant role in our declining exports.

- - Senator David Pryor (D-Arkansas), "We Have Met the Enemy and He Is Us," Newspaper Column, July 16, 1986.

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While American farmers are going through the most difficult economic times since the Great Depression, their own tax dollars are being used to subsidize their foreign competition. This is an outrageous public policy situation.

On the one hand, we are trying desperately to boost the economic condition of American agriculture, and on the other hand, we are providing direct subsidies to our own farmers' competition. This is absurd.

- - Representative Beau Boulter (R-Texas), Congressional Record - House, April 28, 1987 (H. 2614).

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In addition to these policies, the U.S. foreign aid policies are often times contradictory as to the goals we are trying to accomplish in agriculture. It appears that this administration will override, many times, the interest of the American farmer. The Reagan foreign aid policy is subsidizing countries that are in direct competition with U.S. agriculture.

- - Senator Howell T. Heflin (D-Alabama), "The Farm Recovery Act of 1987," Congressional Record - Senate, February 4, 1987 (S.1647)

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U.S. producers can benefit where Multinational Development Bank loans help to improve the income and living standards of farmers in developing countries, according to Bereuter. Statistics show that, as the per capita income of foreign nations increase, so do their purchases of U.S. products, especially agricultural commodities and food products.

"Under the right circumstances, these loans can benefit both the recipient country and U.S. farmers and agribusiness," Bereuter said. "However, we cannot support loans to foreign countries to boost their agricultural exports without damage to American farmers, rural areas and our taxpayers who finance larger subsidy programs. Soybean exports from Argentina have increased eleven-fold since 1981, and in 1985 the International Finance Corporation loaned \$12 million to Argentina with the primary result being greater soybean production. This nonsense, financed with major American contributions, has to stop, and my amendment is intended to stop it.

- - Representative Doug Bereuter (R-Nebraska), Press Release,  
Washington, June 4, 1987.

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## 5. DEVELOPING COUNTRIES AS CUSTOMERS

With Western Europe and Japan not likely to provide rapid market growth in the future, there is growing awareness that U.S. agriculture must look to opportunities in developing countries. Most U.S. farm leaders and recent Secretaries of Agriculture support that argument.

The developing countries already provide a market for over two-fifths of U.S. agricultural exports. But the potential is much greater. With large unmet needs and continuing high rates of population growth, they offer the greatest opportunity for U.S. export expansion in the years ahead. This does not mean that the United States could, or should, expect to satisfy all of the food deficits of the poor countries. But if U.S. agriculture is to achieve substantial growth in its export market, farm leaders generally agree with development specialists that U.S. agriculture must expand sales to the Third World.

### The Income Problem

The problem is that so many people in developing countries do not have the money to buy adequate food. Hence they remain hungry, and the major producing countries continue in surplus. Hunger is a poverty problem, not a question of global food supplies.

The number of hungry and malnourished continues very large despite record world food supplies in the 1980's. Most of the hungry people in the world are hungry because they are poor people living in areas and situations where they have little opportunity to improve their incomes. Yet income improvement is essential if those people are to participate in the world's abundance and become part of the global economy.

Poor countries have poor farmers and subsistence agricultures. Most of their people live and work on the land, much of their income is generated by agriculture, and a large share of that limited income must be spent for food. But as incomes increase in a country, a smaller share of the labor force remains in agriculture and agriculture provides a smaller share of the national product. It is able to do this because it has lifted the productivity of its agriculture.

Thus, in most countries agricultural improvement is fundamental to a strategy of economic expansion and income growth. It not only reduces hunger and malnutrition, it also stimulates economic growth and increases incomes both in agriculture and in the non-farm economy. In the process, the exchange of goods and services is enhanced, internally and between nations.

### The Growth Process

Economic development is complex and varies from country to country. Generally, however, improved agricultural production raises the incomes of farmers while providing food for industrial workers and raw materials for processing. Much of the new farm income goes for local goods and services, which increases non-agricultural employment. That generates more non-farm income, and a high percentage will be spent for food, further stimulating agricultural growth. As agriculture improves, labor is freed to meet the needs of non-farm enterprise. New income creates additional demand, encourages savings, and enlarges corporate investment.

According to Gary Vocke of the Economic Research Service, U.S. Department of Agriculture, "these rising incomes create food demand that eventually outpaces growth in agricultural production, which is partly why developing countries relied more on imports of food grains and coarse grains during the 1970's. The increase in trade reliance was not due to

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declining production, rather, it was due to rising consumption based increasingly on imports supported by rising per capita incomes" (Vocke, 1987).

Other researchers have arrived at similar conclusions. John Mellor, Director of the International Food Policy Research Institute, concluded as early as 1978 that "policies that stimulate development of the domestic agricultural sectors of Third World countries may provide the most rapid growth in their agricultural imports" (Mellor, 1978).

Arthur B. Mackie, Thomas L. Vollarth, and Lon C. Cesal of the Economic Research Service wrote in the Yearbook of Agriculture 1981 that the "prosperity of the American farmer is directly related to agricultural development and economic growth in other nations" (Mackie, Vollarth and Cesal, 1981).

Elmer R. Kiehl, University of Missouri, concluded in 1983 that the Third World market "can be developed over time through technical assistance in agricultural development" (Kiehl, 1983). John E. Lee, Jr., and Matthew Shane of the Economic Research Service wrote in 1985 that "growth in the low and middle income countries is the main hope for significant intermediate and long-term expansion of U.S. farm exports..." (Lee and Shane, 1985).

James P. Houck, University of Minnesota, found that for low income nations, "investments in agricultural development through successful technical assistance and education are not detrimental to U.S. farm export interests. They are generally beneficial" (Houck, 1986). Robert L. Paarlberg of the Harvard Center for International Affairs found in 1986 that in such countries "the paradoxical result of successful farm development can be larger farm import demand" (Paarlberg, 1986).

Political leaders also have recognized the value of overseas development to American agriculture. John Block, President Reagan's first

Secretary of Agriculture, acknowledged the concerns that U.S. farmers would be hurt by assistance to developing countries and concluded: "Nothing could be further from the truth."

Orville L. Freeman, Secretary of Agriculture in the Kennedy and Johnson administrations, argued in 1984 that "American farmers should be the first to advocate aid to developing countries" (Freeman, 1984). Clifford M. Hardin, President Nixon's first Secretary of Agriculture, wrote in 1986 that rising income in developing countries "translates into a rising demand for feed grains and soybeans" (Hardin, 1986).

Some producer organizations, too, have recognized the importance to American farmers of agricultural development in low and middle income countries. An educational program supported by the American Farm Bureau Federation, the National Farmers Union, CARE, and the National Cooperative Business Association made the point that: "Nations which have been able to improve their agricultural productivity have at the same time increased their food imports" (Sharing Global Harvests, 1984).

The U.S. Feed Grains Council argued in a newsletter in March 1987 that "gains in the agricultural sectors of these countries are mostly beneficial for U.S. farmers because it is necessary for the overall growth that stimulates demand for products like feed grains" (U.S. Feed Grains Council, 1987).

The conclusion is that success in growing more food does not usually bring a reduction in food imports. As diets improve and incomes rise, consumers begin to want more and better food. Increased purchasing power makes possible a growth in food imports. And if this phenomenon is extended across the developing world of 4 billion people, effective world demand will be enhanced. Export opportunities will be enlarged.

## REFERENCES

### Growth Markets of the Future

The single most important potential source of expanded demand for U.S. commodities rests in the expanding populations of the less developed and particularly, the middle-income countries. Evidence continues to accumulate to support the notion that economically emerging nations constitute significant markets for the U.S. economy.

- - D. Woods Thomas, Professor of Agricultural Economics, Purdue University, Statement AID-BIFAD, Washington, D.C., October 28, 1982.

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The thesis here is that growth in the low and middle income countries is the main hope for significant intermediate and long-term expansion of U.S. farm exports and for the efficient utilization of the nation's agricultural resources. Realizing that potential requires the will to make some painful internal tradeoffs. The alternative is to accept gradual reduction of U.S. agricultural capacity and the accompanying difficult adjustment.

- - John E. Lee, Jr. and Matthew Shane, "U.S. Agricultural Interest and Growth in the Developing Economies: The Critical Linkage," U.S. Department of Agriculture (Economic Research Service), June 1985.

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In recent years nearly half of United States agricultural exports have gone to developing countries. With their exploding populations, they are the growth area for agricultural exports -- if they can earn the dollars to pay for them by selling to us. It has been shown time and again that when individual incomes in developing countries rise, there is an almost immediate demand for more animal protein in the diet. That translates into a rising demand for feed grains and soybeans.

- - Clifford M. Hardin, former Secretary of Agriculture (Nixon Administration), "Trade War Follies," New York Times, August 21, 1986.

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Developing countries are the most likely growth markets for U.S. agricultural exports. The best U.S. strategy for increasing the potential of agricultural exports to developing countries is to encourage economic growth in these markets, which will lead to higher incomes and increased food demand. Developing countries will then import more U.S. farm products to meet part of their increased demand.

By increasing the productivity of the land, new agricultural technology can initiate broad-based economic development leading to industrialization and rising per capita incomes. These rising incomes create food demand that eventually outpaces growth in agricultural production, which is partly why developing countries relied more on imports of food grains and coarse grains during the 1970's. The increase in trade reliance was not due to declining production, rather, it was due to rising consumption based increasingly on imports supported by rising per capita incomes.

- - Gary Vocke, "Economic Growth, Agricultural Trade and Development Assistance," Agriculture Information Bulletin No. 509, Economic Research Service, U.S. Department of Agriculture, March 1987.

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#### Development Creates More U.S. Customers

Accelerated economic growth in Third World countries can result in immense growth in their agricultural imports. Because of the close interrelation of employment growth, demand for food, and the supply of agricultural commodities, the policies that stimulate development of the domestic agricultural sectors of Third World countries may provide the most rapid growth in their agricultural imports.

- - John Mellor, International Food Policy Research Institute, "Third World Development and the Demand for Agricultural Exports -- The Role of the United States," Paper presented at a symposium sponsored by the Federal Reserve Bank of Kansas City, May 18-19, 1978.

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These discussions show that U.S. farm exports climb as economic growth in other countries transforms them from low-income to high-income nations. Agricultural development plays a vital role in fostering economic growth in the low-income countries. Thus, through trade linkage, prosperity of the American farmer is directly related to agricultural development and economic growth in other nations.

- - A. B. Mackie, T. L. Vollrath, and L. C. Cesal, "If Poor Nations Prosper, U.S. Picks Up Customers," Yearbook of Agriculture, 1981.

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Short-run competitive relationships do arise and will always exist. However, this is not nearly as serious with the low-income developing countries where production tends to parallel that of the United States.

In any event, the interest of American farmers is to expand the total world market by enhancing the ability of more countries to import from the United States.

- - A. B. Mackie, T. L. Vollrath, and L. C. Cesal, in Yearbook of Agriculture 1981, p. 274.

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The greatest long-term expansion possibility is in the Third World. Strange as it may seem at first glance, this market can be developed over time through technical assistance in agricultural development. Helping Third World countries to help themselves ultimately means market expansion and at the same time promoting food security worldwide.

- - Elmer R. Kiehl, Professor, Agricultural Economics, University of Missouri, statement presented at the Annual Meeting, American Institute of Cooperation, Columbus, Ohio, August 1, 1983.

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Agricultural success generates domestic demand for industrial products, supplies inexpensive food to industrial workers and raw materials for agro-processing, earns foreign exchange to finance imports of capital and intermediate goods for industry, and encourages labor-intensive industries in small towns and villages. When the fact that the majority of poor people live in rural areas is also taken into account, the importance of a continued focus on agricultural growth and rural development is confirmed.

- - Development Issues: U.S. Actions Affecting Developing Countries, the 1983 Annual Report of the Chairman of the Development Coordination Committee, U.S. International Development Cooperation Agency, Washington, D.C., page 86.

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American farmers should be the first to advocate aid to developing countries, particularly agricultural technical assistance, to expand their economies and improve incomes. Only in that way can a poor country move into the economic mainstream and become a growth customer for U.S. farm products.

- - Orville L. Freeman, former Secretary of Agriculture now President of the Agriculture Council of America, "An Agricultural Policy for the U.S.: 1985-1990," speech to Southern States Cooperative Annual Meeting, November 14, 1984.

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Helping these developing countries to join the family of nations as full trading partners is a wise course for American farmers. It is sometimes argued that aid for agricultural development would enable the recipients to become self-sufficient in food and perhaps become competing exporters. Recent developments, however, indicate just the opposite. Nations which have been able to improve their agricultural productivity have at the same time increased their food imports.

Even if there are gains in food production in the developing countries, it is expected that population growth and rising food demand will widen the food gap in these countries and require greater imports.

- - Sharing Global Harvests: Development, a Development Education Project, 1984.

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But the lessons are clear, at least for the low income nations on the planet. In particular, a strong case can be made for the idea that advances in agricultural productivity are associated with increases in imports of cereals and other agricultural products. The connection comes via the positive income effect of general economic development. For these countries, investments in agricultural development through successful technical assistance and education are not detrimental to U.S. farm export interests. They are generally beneficial.

- - James P. Houck, "Foreign Agricultural Assistance: Ally or Adversary," Staff Paper P86-50, University of Minnesota (Institute of Agriculture, Forestry and Home Economics), November 1986

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But an entirely different response to added farm production can be noted among today's developing countries, where large numbers of poor people with poor diets are directly dependent upon farming for income and employment. In such countries, where most of the income gained from farm growth will go directly into additional food consumption, the paradoxical result of successful farm development can be larger farm import demand.

- - Robert L. Paarlberg, "United States Agriculture and the Developing World: Partners or Competitors?" Curry Foundation, Washington, D.C., 1986

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The U.S. benefits because as developing countries grow richer, they can't meet their citizen's demands for food and must turn to imports. The paradoxical result is that successful farm development in developing countries often creates a demand for more imports.

- - Randall B. Purcell, Director, Curry Foundation, "Develop Their Agriculture to Save Ours," Wall Street Journal, January 23, 1987.

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It is of crucial importance to understand the paramount role that agriculture plays in the economies of the low-income developing countries. Most of these countries are still agricultural in nature, and agriculture is the major source of employment and income. Without economic progress in this sector, and therefore higher per capita income, there is little or no stimulus for growth in the other sectors. Contrary to popular belief, gains in the agricultural sectors of these countries are mostly beneficial for U.S. farmers because it is necessary for the overall growth that stimulates demand for products like feed grains.

- - U.S. Feed Grains Council, "Why U.S. Aid Programs are Beneficial to U.S. Farmers," Focus on Foreign Markets, Washington, D.C., March 1987.

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## 6. THE TECH REVOLUTION IN AGRICULTURE

Underlying many anti-development comments is the fear that agriculture is on the verge of a high-tech revolution that will flood the world with farm surpluses. A corollary concern is that this phenomenon is supported and made possible by the transfer of agricultural technology to other countries from the United States.

A New York Times headline proclaimed on September 9, 1986: "Scientific Advances Lead to End of Surplus Around the World." The writer, Keith Schneider, cautioned, however, that "This is not to say that all people are well fed. Africa provides grim reminders that the world has not solved its hunger problem. Inefficient distribution of food and inequities in income leave many without enough to eat. But today hunger is less the result of absolute food shortages than of political situations and policy discussions" (Schneider, 1986).

Foreign Affairs, in its Spring 1985 issue, published an article entitled, "The World is Awash in Grain," written by Barbara Insel of the Council on Foreign Relations. Its theme was that the world is learning how to feed itself and "we have entered an era of permanent grain surpluses, of a buyer's market for grain exports, where the United States can no longer set the rules" (Insel, 1985).

Dennis Avery, senior food policy analyst at the Department of State, argues that developing countries are rapidly becoming self-sufficient, if not net exporters, and this has serious implications for U.S. agriculture. In an article in Science magazine, October 1985, he wrote that world agricultural production is increasing rapidly, especially in developing countries, and that "constraints such as cropland shortage, soil erosion, and higher oil prices have been readily surmounted" (Avery, 1985).

Other analysts, however, are less certain that technology now assures a permanent world surplus. The Office of Technology Assessment, in a March 1986 report, advised that: "Any conclusion about the balance of global supply and demand requires many assumptions about the quantity and quality of resources available to agriculture in the future. Land, water, and technology will be limiting factors as far as agriculture's future productivity is concerned" (OTA, March 1986). OTA found that the "biotechnology and information technology era" will have immediate impacts on animal production, while the impacts on plant production will take longer.

### Third World Prospects

There is evidence that the significance of production increases, especially in developing countries, has been overstated. Robert L. Thompson, Dean of Agriculture at Purdue and former Assistant Secretary of Agriculture in the Reagan Administration, believes the rise in production is less important than the decline in consumption. With recent slowdowns in economic growth, he said, "the growth in per capita food consumption in the 1980's has slowed to less than two-thirds the pace of the 1970's" (Thompson, 1986).

Nor is rapid growth a certainty in the future. G. Edward Schuh, Director, Agriculture and Rural Development Department, World Bank, cautioned that "a sharp increase in agricultural production in developing countries is unlikely." He said increases of 3.5 percent to 4 percent per year on a sustained basis have proved quite difficult. "Few have managed to achieve such increases on a sustained basis except when extensive new lands have been brought into production, and most developing countries do not have much new land available for cultivation anymore" (Schuh, 1986).

Robert Paarlberg of Harvard confirms that agricultural production in most poor countries is actually not growing rapidly. In testimony May 20, 1987 before the House Committee on Banking, Finance, and Urban

Affairs, Paarlberg argued that per capita farm production in developing countries remains today "at roughly the same inadequate level that was noted throughout the 1970's, when we were talking about a Third World 'food crisis' rather than a food glut" (Paarlberg, 1987).

### The Hunger/Surplus Cycle

Other analysts, too, point to the cyclical nature of conventional wisdom concerning hunger and surplus, suggesting that the pendulum may swing again. An era of global shortage was proclaimed in the mid-1960's, to be followed by general optimism based on the Green Revolution. The specter of world famine rose again in the mid-1970's, only to be replaced in the 1980's by the common belief that global abundance is now permanent. Some suggest that those who hold this view should offer it subject to change.

In any event, we have seen that global surplus does not insure the eradication of hunger and malnutrition. Nor should it be expected to produce a world where each country grows all of its own food. The global interdependence so evident in agriculture is not likely to be reversed, and nations are not likely to become less dependent on trade.

The evidence suggests that expansion in agricultural trade can be speeded by efforts to foster economic development in poor countries. It suggests that U.S. agriculture has a better than fair chance to share in the global benefits.

### Technology Transfer

Matt Wood, editor and agricultural economist, writes that farming skills are not easily exported. "The idea that U.S. farmers' know-how can be transferred to a foreign producer like a secret formula is questionable. It takes years of painstaking effort to teach a farmer who is following several generations of subsistence farmers to adapt to state-of-the-art ag technology." Wood argued that a policy of "trying to put a

lock on agricultural technology" would be doomed. He argued that "neither U.S. farmers, nor the U.S. government owns the technology used by U.S. growers" (Wood, 1986).

In a 1986 report, the Office of Technology Assessment wrote that, although the pace of technology transfer has accelerated the past two to three decades: "Compared to many industries -- manufacturing, for example -- technology transfer in agriculture proceeded at a slow rate, in part because of its varied biological nature, and in part because much agricultural production remains the province of millions of small-scale farmers slow to adopt new technologies" (Office of Technology Assessment, October 1986).

Another element in technology transfer often overlooked is that the United States also benefits from the exchange. American researchers have often pointed out that technology transfer is a "two-way street" and that this has benefitted U.S. agriculture since its beginning. The California Agricultural Lands Project reports that American scientists have collected 440,000 wild plants, mostly from other countries, because the U.S. is "gene poor" (California, 1982). Among all crops cultivated commercially, only the sunflower, cranberry, blueberry, strawberry, and pecan originated here. Of an estimated 240,000 plant species living on earth, two-thirds are in the tropics (California, 1985).

Robert Thompson of Purdue and others have made the point that the technology revolution should benefit U.S. agriculture most by making it more competitive in international trade. "This revolution," according to Thompson, "has the potential to increase agricultural productivity and reduce our unit costs by yet unknowable means." He called support for agricultural research and development "my best prescription for improving the global competitiveness of U.S. agriculture..." (Thompson, 1986).

## REFERENCES

### The Technology Revolution

Scientific and technical advances in agriculture have yielded an era in which harvests are now outpacing population growth, producing for the first time more food than the world needs.

From 1960 to 1986, the amount of land on which grain was planted grew by less than 11 percent. Yet in the same period, improvements in crops and planting practices caused grain harvests to more than double. This year, grain production will total roughly 1.64 billion metric tons, according to the Department of Agriculture.

This is not to say that all people are well fed. Africa provides grim reminders that the world has not solved its hunger problem. Inefficient distribution of food and inequities in income leave many without enough to eat. But today hunger is less the result of absolute food shortages than of political situations and policy decisions.

- - Keith Schneider, "Scientific Advances Lead to Era of Food Surplus Around World," New York Times, September 9, 1986.

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Countries such as India and China, once major wheat buyers, now produce enough to feed themselves and have entered the export market. China is becoming a major grain producer, with corn output up 15 percent a year since 1982, rice output up 20 percent and wheat output up 40 percent. Even the desert kingdom of Saudi Arabia, using its oil wealth to subsidize its farmers, produces enough wheat to feed itself, and the U.S. Department of Agriculture predicted last week that the Saudis may become net wheat exporters this year.

- - Stuart Auerbach, "U.S. Wheat Industry Hungry for Foreign Sales," Washington Post, July 20, 1986

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Now we're on the verge of a new technological revolution. Work in biogenetics here in the U.S. promises to bring our farmers new gains in productivity and the chance to gain a competitive edge. It's almost frightening to think about the potential for increased milk production from bovine growth hormone, or the likelihood of bioengineering and biotechnology breakthroughs that could produce even larger surpluses in major field crops. We've got tremendous potential for some things to happen.

- - Kenneth L. Bader, Chief Executive Officer, American Soybean Association, "U.S. Agricultural Interests in the Third World," Address to the Food and Agriculture Committee, National Planning Association, St. Louis, Missouri, March 21, 1986.

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What happened is that American agriculture -- and that of many of our friends and neighbors -- has succeeded all too well. The heartbreaking scenes of famine in the Sahel notwithstanding, the world is learning how to feed itself. And, like the United States, the world has also learned how to protect its farmers by supporting grain prices artificially, stimulating still higher levels of production. As a consequence, we have entered an era of permanent grain surpluses, of a buyer's market for grain exports, where the United States can no longer set the rules. We now find ourselves in a world awash in grain, with ever-increasing bills for producing, maintaining and storing the unwanted product of our labors.

Technological improvements are now largely built into the cycle of production expansion. Investment in new technologies and yield-improvement practices is especially stimulated by public policies which ensure high, stable prices for farm output. But even without -- or in spite of -- government intervention, the expansion of productivity seems destined to continue or even accelerate, as the European Economic Community learned this past year.

- - Barbara Insel, Council on Foreign Relations, "World Awash in Grain," Foreign Affairs, Spring 1985.

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World agricultural production is at an all-time high and is climbing especially in the developing countries. Even Africa has ample land and technology to feed its population, given more effective national policies. Higher agricultural output has been stimulated primarily by new technology, but also by investments and improved government policies. Constraints such as cropland shortage, soil erosion, and higher oil prices have been readily surmounted. High-technology agriculture has even overcome some major "systems breaks." Thus U.S. farmers will continue to face commercial surpluses of farm products in world markets in the years ahead.

- - Dennis Avery, Senior Agricultural Analyst, Bureau of Intelligence and Research, Department of State, Washington, D.C., Science, October 1985.

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### The Role of Technology Transfer

All told, the government agency provided at least \$341 million to American land grant universities and other colleges for overseas projects, many of them in countries that compete with the United States for export markets.

- - Forest Laws, "Government Aids Farm Competitors," Southwest Farm Press, July 18, 1985.

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What is happening is that these nations have and are adopting new agricultural technology. And much of the technology is coming from the U.S. I can tell you from personal experience that U.S. farmers are concerned and vocal over this seeming rush to export our production technology that once made them the world's most efficient producers.

- - Kenneth L. Bader, Chief Executive Officer, American Soybean Association, "U.S. Agricultural Interests and the Third World," Address to the Food and Agriculture Committee, National Planning Association, St. Louis, Missouri, March 21, 1986.

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The question seems simple: Can American farmers survive if Americans export the farmers' skills?

Contend some in the peanut business, while Americans like to think they "feed the world," foreign competition is proving otherwise. The assumption that American farmers had a corner on food production technology and could benevolently export it to less-privileged nations so the less-privileged could feed themselves was one widely accepted, growers admit.

But something went wrong -- terribly wrong -- with the moral plan. Take the case of soybeans, explain growers. Dawson, Georgia peanut producer Wilbur Gamble puts it this way, "Brazil told us they wanted to grow soybeans to feed the hungry masses. But some had other plans for the technology we sent. They were helped to produce for export by the World Bank (and other banks) to repay delinquent loans. Today they are the major competition for American soybean producers."

Chris Street, "A.I.D. Should We Export Skill to the Third World?" The Peanut Farmer, April 1986.

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The only problem is that the bottom has fallen out. Half the world doesn't need our food, or can't pay for it. As that credit so lavished on our farmers comes due, foreclosures result.

Meanwhile the export of our technology continues unabated.

American agricultural technology is one of our nation's most valuable assets. We must stop giving it away. Technology should not be sold but treated as a national resource. We should also consider slowing down the funding of agricultural research. If we have any more agricultural technology breakthroughs, we may not be able to recover.

- - Bob Mayer, California farmer and former Assistant Secretary of Agriculture (Carter Administration), Los Angeles Times, May 13, 1986.

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"We're kind of getting the shaft." said Cecil (Gene) Vining, as he worked with a tractor to build terraces on rich black soil in Richmond, Kansas, about an hour's drive from here.

Now he questions the wisdom of buying the land, especially since four close neighbors have been forced to sell their farms. "When it gets that many that close, it gets scary," Vining said.

He blames hard times on the slowdown of exports. "Look at all the exporting countries that were importing countries a few years ago," he said. "We told them too much and made them direct competitors."

- - Stuart Auerbach, "U.S. Wheat Industry Hungry for Foreign Sales," Washington Post, July 20, 1986.

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Compared to many other industries -- manufacturing, for example -- technology transfer in agriculture proceeds at a slow rate, in part because of its varied biological nature, and in part because much agricultural production remains the province of millions of small scale farmers slow to adopt new technologies. Over the past two to three decades, however, the pace of international transfer of agricultural technology has increased. Developing countries have improved their capabilities in conventional agricultural science; at the same time, developed countries, such as West Germany, France, and Japan, have established sophisticated, competitive agricultural input industries.

- - Office of Technology Assessment, U.S. Congress, "A Review of U.S. Competitiveness in Agricultural Trade," October 1986.

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### More Moderate Views

Many observers have focused on overseas production growth, but to account for changes in global trade, the consumption decline has been a more important factor. In the 1970's, the annual average increase in foreign grain production was 24 million tons; this was exceeded by consumption growth of 34 million. Consequently, foreign net grain imports grew by 10 million tons a year. However, in the 1980's, growth in foreign grain output has risen to 29 million tons, while consumption growth plunged to 19 million a year.

As a result, the growth in per capita food consumption in the 1980's has slowed to less than two-thirds the pace of the 1970's.

So my first prescription for improving the global competitiveness of U.S. agriculture is to increase the rate of technological advance by maintaining support for agricultural research and development. We are poised on the threshold of a new technological revolution in agriculture,

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that of biotechnology or genetic engineering. This revolution has the potential to increase agricultural productivity and reduce our unit costs of production by yet unknowable means.

The biotechnology revolution is no more stoppable than was the Industrial Revolution, and it holds similar potential for improving the future well-being of mankind.

- - Robert L. Thompson, Assistant Secretary of Agriculture for Economics, Remarks, 1987 Agricultural Outlook Conference, USDA, December 2, 1986.

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During the decade of the 1970's, you may recall, it was fashionable to worry about farm production slowdowns in the developing world. There was much talk about a "world food crisis." But during that decade the volume index of agricultural production for all the developing market economies, calculated by the U.N. Food and Agriculture Organization, was increasing at a respectable average annual rate of about 3 percent. Now in the 1980's it has become fashionable to talk about productivity breakthroughs and rapid farm production gains in the developing world. But so far this same FAO volume index of actual poor country production hasn't gone up any more rapidly. In fact, it has gone up more slowly, at an average annual rate of just 2.9 percent between 1980 and 1985. One USDA calculation estimates LDC agricultural production growth at just 2.5 percent between 1981 and 1984. So despite a few highly visible success stories, farm production in the developing world as a whole in the 1980's has not suddenly surged above historical trends. In per capita terms, in fact, farm production in the developing world has remained essentially constant since 1973. It remains today at roughly the same inadequate level that was noted throughout the mid 1970's, when we were all talking about a Third World "food crisis" rather than a food glut.

- - Robert L. Paarlberg, Center for International Affairs, Harvard University, "Is Agricultural Success in Poor Countries Good or Bad for U.S. Agriculture?" Testimony before Subcommittee on International Development Institutions and Finance, House Committee on Banking, Finance and Urban Affairs, May 20, 1987.

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A sharp increase in agricultural production in developing countries is unlikely. Increasing agricultural output by 3.5 percent to 4 percent per year on a sustained basis has proved quite difficult. Few have managed to achieve such increases on a sustained basis except when extensive new lands have been brought into production, and most developing countries do not have much new land available to cultivation anymore. However, if they pursue sound economic policies, increases in per capita income of 3 percent to 5 percent may not be difficult to achieve. Newly industrialized countries such as South Korea, Brazil and Mexico all achieved higher growth rates when conditions were favorable.

- - G. Edward Schuh, Director, Agriculture and Rural Development Department, World Bank, "Some Healthy Competition for U.S. Farmers," Washington Post, September 4, 1986.

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Who's to blame for the development of agriculture outside the United States? Have government-funded researchers been collaborating with the enemies of U.S. farmers? It may have happened but trying to put a lock on agricultural technology is a policy doomed to failure.

Agricultural production outside the United States has flourished because it makes economic sense. For Third World countries, exporting agricultural commodities creates foreign exchange badly needed for development. Developing nations have created incentives for agricultural exports and they will continue to do so. World commodity prices have been high enough to make the investments pay off.

Has our government helped? In some cases it may have. But, neither U.S. farmers, nor the U.S. government owns the technology used by U.S. growers.

- - Matt Wood, agricultural economist and editor, The Flue-cured Tobacco Farmer, "Technology Export: Healthy Course in the Long Run," The Peanut Farmer, April 1986.

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Like the eras that preceded it, the biotechnology and information technology era will bring technologies that can significantly increase agricultural yields. The immediate impacts of these technologies will be felt first in animal production. Through embryo transfers, gene insertion, growth hormones, and other genetic engineering techniques, dairy cows will produce more milk per cow, and cattle, swine, sheep, and poultry will produce more meat per pound of feed.

Impacts on plant production will take longer, almost the remainder of the century. By that time, however, technical advances will allow some major crops to be altered genetically for disease and insect resistance, higher production of protein, and self-production of fertilizer and herbicide.

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Any conclusion about the balance of global supply and demand requires many assumptions about the quantity and quality of resources available to agriculture in the future. Land, water, and technology will be the limiting factors as far as agriculture's future productivity is concerned.

- - Office of Technology Assessment, U.S. Congress, "Technology, Public Policy and the Changing Structure of American Agriculture," March 1986, p. 10.

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At least 440,000 of these wild plants have been collected, mostly from other countries, because the United States is "gene-poor" -- only the sunflower, cranberry, blueberry, strawberry and pecan originated here. All other commercial varieties have come from somewhere else.

What have these plant "immigrants" done for us and the world? Literally tons -- measured in crops that would otherwise have been decimated by disease.

- - 1982 California Agricultural Lands Project, "Quick Book: Genetic Engineering of Plants," p. 8.

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Consider this: an estimated 240,000 plant species exist on Earth; two-thirds are in the tropics and one-fourth can be found in Latin America alone. The International Union for the Conservation of Nature and Natural Resources (IUCN) estimates that 20,000-25,000 species are threatened with extinction. And estimates of the numbers of plant species yet to be discovered, much less named and described, start at 15,000. But, remarks Dr. Peter Raven, director of the Missouri Botanical Garden, "These figures are all guesswork anyway."

- - 1985 California Agricultural Lands Project, "Brief Book: Biotechnology and Genetic Diversity," by Steven C. Witt, p.17.

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## 7. THE POLICY CHOICES

The development trade issue is a policy conflict between efforts to expand the world market overall and concerns that the interests of certain commodity groups may be damaged in the short term.

Critics of U.S. development policy contend that the interests of American farmers are ignored, or at best subordinated, to foreign policy goals and charitable considerations. They argue that U.S. farmers are no less humanitarian than other groups -- that they "give at the church" and in taxes but should not be expected to make additional sacrifices in the marketplace. They believe that development agencies, intentionally or unintentionally, are creating new competition and undercutting American agriculture.

Pro-development people argue that: (1) Third world countries are potentially the growth market of the future. (2) Agricultural development is essential if Third World countries are to generate the purchasing power necessary to expand their imports of U.S. farm products. (3) Agricultural development in Third World countries is generally not a threat to American farmers.

When the Malthusians predicted in the last century that world population would outrun the food supply, they took little or no account of the potential for improved output per acre. Similarly, those who now anticipate a surplus-ridden world made up of self-sufficient countries may be paying too little attention to the potential for improved demand.

More than a half dozen major studies have now documented the connection between income growth and the demand for food -- and the importance of that connection to American exporters. These studies, conducted since 1979, show that, in countries where diets are poor, most additional income will go for food. Once caloric intakes are adequate, families with

rising incomes will move on to higher quality cereals and animal products such as meat, poultry, eggs, and dairy products.

The new demand for such products eventually results in commercial exchange, and countries that have comparative advantage will benefit. International trade can, of course, be restricted and distorted by government actions, but ultimately it is to be expected that a country such as the United States, with comparative advantage in grains, soybeans and animal products, will benefit from increased global demand for better food.

For the most part, these analyses by major universities and policy study groups take little account of the impact on demand of future population growth. They focus on demand and dietary improvement within existing populations and conclude that agricultural improvement in Third World countries is beneficial to American farmers.

### **The Population Imperative**

Population analysts, meanwhile, are as unrelenting as ever in their forecasts of population growth into the next century. The Population Reference Bureau projects a global population of 6.2 billion in 2000 and 8.0 billion in 2020, compared with a 1987 estimate of 5.0 billion. This means that in one third of a century -- one generation -- world population will grow by 3 billion people or almost 60 percent. And 2.8 billion of those additional people will be in countries now classed as developing.

U.S. agricultural leaders tend to overlook or minimize population projections simply because past promises of world shortages and "hundreds of millions of new customers" have not paid off for farmers. It is not that rapid population growth did not occur -- the world has added more than 3 billion people in this century. But the greatest population growth is among groups having low ability to buy, and the potential gains from increased consumption have never been realized on a global scale.

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Nevertheless, the population data are significant. They support the view that U.S. agriculture's preoccupation with Japanese and West European markets is increasingly obsolete. Since World War II, U.S. market development has centered heavily on those 20 or so countries, with the result that 60 percent of U.S. farm exports still go to countries with only 10 percent of the world's people. Also, a disproportionate share of U.S. energy goes into efforts to resolve trade policy disputes with those countries. Witness the high profile given to the push to open Japanese beef, rice, and citrus markets and the U.S. quarrels with the European Community over access for American vegetable oil, corn, and corn gluten.

Yet Western Europe and Japan together account for only 9.5 percent of the world's population. By 2000, these countries will represent 7.9 percent and by 2020 the proportion will be only 5.9 percent. Western Europe's total growth between now and 2000 is projected at less than 1 percent, and population will actually show a net decline by 2020. Japan is projected to gain fewer than 5 million people or 3.6 percent between 1987 and 2000, then lose most of that gain by 2020. (See Table 2.)

### The Urge to Self-Sufficiency

Developing countries often aspire to self-sufficiency. It is understandable that a country with hungry people, few resources, and a shortage of foreign exchange might want to become more nearly self-sufficient in food. In fact, however, success in growing more food does not usually bring a reduction in food imports. As incomes and living levels rise, consumers want diets of higher quality and variety, and they find they have the purchasing power to look beyond their own borders.

So, while the country may become self-sufficient in terms of assuring survival, it does not become self-sufficient in a market sense because it is importing more food than ever -- and living better. Such a scenario can be frustrated for a time by the actions of individual governments, but that does not invalidate the general proposition that

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Table 2. Estimated World Population by Selected Areas: 1987, 2000, 2020

	<u>1987</u>	<u>Millions</u> <u>2000</u>	<u>2020</u>
Western Europe*	357	360	347
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Japan	122	127	123
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Total Developed Countries	1,191	1,263	1,330
=====			
Less Developed Countries Other than China	2,774	3,696	5,301
China	1,062	1,200	1,361
Total Less Developed Countries	3,836	4,896	6,662
=====			
Soviet Union	284	312	355
Eastern Europe	113	118	125
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United States	244	268	297
=====			
World Total	5,026	6,158	7,992

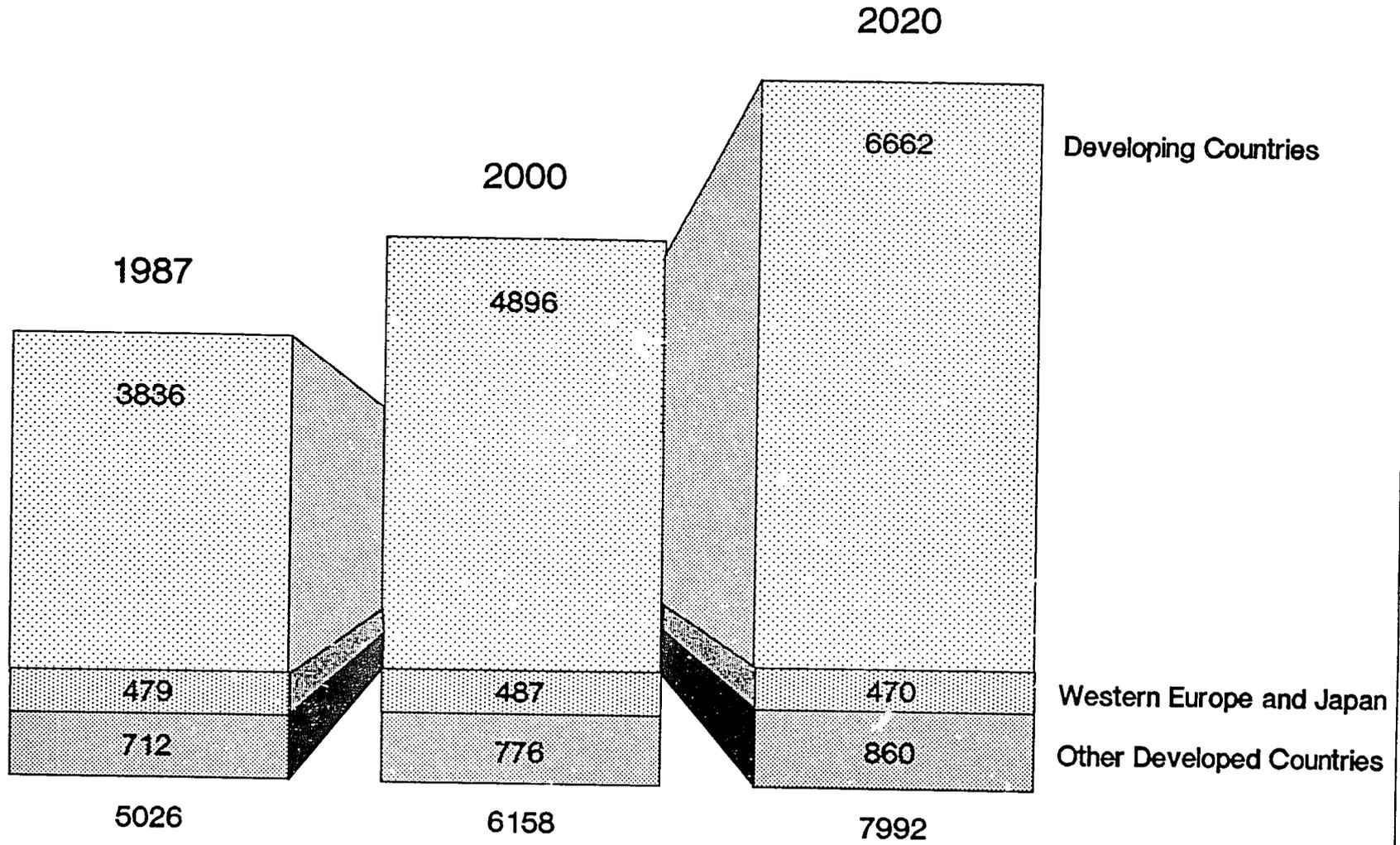
Source: Population Reference Bureau, 1987

\* Denmark, Finland, Iceland, Ireland, Norway, Sweden, United Kingdom, Austria, Belgium, France, West Germany, Luxembourg, Netherlands, Switzerland, Greece, Italy, Portugal, and Spain.

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# World Population Trends

(In Millions)



SOURCE: 1987 Estimates, Population Reference Bureau

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agricultural development generates broad-based income growth which stimulates the demand for imported agricultural products.

The World Bank, in its World Development Report 1986, wrote that most Asian countries cite self-sufficiency in food as an important policy aim and that many have succeeded in vastly extending their use of modern wheat and rice varieties. "But such successes do not necessarily mean that self-sufficiency is a desirable policy. Substantial gains from trade can be foregone in its pursuit" (World Bank, 1986).

Writing about the Middle East, Marvin G. Weinbaum of the University of Illinois in Urbana concluded: "Official government rhetoric aside, no country in the region seriously contemplates complete self-sufficiency in all food staples." Weinbaum, an associate professor of political science, said the economic rationality of pursuing self-sufficiency is weak so long as comparative advantage has any bearing on cropping choices. "There exists no case in the Middle East of a country prepared to insulate itself from the global market economy..." (Weinbaum, 1986).

David N. Balaam, a political scientist at the University of Puget Sound in Tacoma, pointed out that as recently as 1960 Japan was 90 percent self-sufficient in food. The decline in self-sufficiency during the 1970's was worrisome to many Japanese. But today, Japan is only about 50 percent self-sufficient. Self-sufficiency levels declined sharply for wheat, soybeans, and feed-grains -- commodities which the United States began to supply in larger quantities (Balaam, 1986).

Policies favoring self-sufficiency may seem logical when taken in isolation, the World Bank concluded. "Taken together, however, they add up to a bias against a well-integrated world agriculture capable of capturing the full benefits of trade."

## The Pro-Development Response

Supporters of development assistance argue that most of the criticism regarding foreign development assistance does not stand up to scrutiny. They argue, for example, that development assistance is not responsible for the emergence of Brazil and Argentina as agricultural exporters. Brazil would have become a soybean exporter without the \$1 million spent in soybean assistance by the U.S. Agency for International Development. Argentina became a soybean exporter with no direct U.S. assistance.

While in some instances U.S. commodity groups may be temporarily affected, the broader overall impact of development assistance has been to expand export markets for U.S. farm products. They point to the growth in share of U.S. farm product exports going to developing countries and argue that future market growth must occur in those same countries. Studies at the U.S. Department of Agriculture, the University of Illinois, the University of Minnesota, the Curry Foundation, the International Food Policy Research Institute, and other institutions support the proposition that countries increase their food imports as they improve their own production.

Richard Krumme, Editor of Successful Farming magazine, made that point pungently in his May 1987 issue: "Stop bellyaching about spending money overseas to develop poor countries' agriculture.... It is absolutely, definitely and positively in your best interest to see rapid growth in these countries in Asia and Africa" (Krumme, 1987).

### Export Decline: The Causes

Pro-development people react strongly to any argument that development aid to Third World countries is responsible for the decline in U.S. agricultural exports since 1981. Economic analysts have attributed that decline to a combination of factors, including macroeconomic elements beyond the control of aid and trade policymakers.

After three years of export decline, the Department of Agriculture summarized on December 3, 1984: "A worldwide recession has slowed the demand for agricultural products in the 1980's, while global production capacity remains large. This has resulted in slow growth in global agricultural consumption and has meant increased competition from other countries for international markets. U.S. agricultural exports were hurt further by the strong dollar and higher prices for U.S. products abroad" (Donald, 1984).

Nigel Smith, professor of geography at the University of Florida, argued in the Christian Science Monitor of December 17, 1986, that, "foreign assistance has become a scapegoat for the folding of so many farms and the downturn in agricultural exports in the U.S." According to Smith, "the overvalued dollar, high interest rates, market distortions created by \$25 billion worth of subsidies every year, drought, the mounting debt of many Third World countries, and a slowdown of the world economy in the 1980's are the main causes of the decline in U.S. agricultural exports and farm foreclosures" (Smith, 1986).

Third country exporters have actually lost market share in world trade during the past five years. It is the traditional exporters other than the United States that have been the big gainers. Those countries -- Canada, Australia, Argentina, and the West European nations -- increased their share of the world agricultural market from 44 percent in 1975 to 49 percent in 1983. The U.S. share remained relatively constant while the developing countries as a group lost market share.

Consider wheat and feed grains, which historically have made up 35 to 50 percent of U.S. agricultural exports by value. In the four years between 1981/82 and 1985/86, world trade in those grains declined by 37 million tons. U.S. exports went down even more, however, by 49 million tons. The difference was made up by an increase of 12 million tons in exports by Australia and Western Europe. In other words, the U.S. share of the world market for wheat and feed grains declined from 54 percent to 36 percent, but little or none of that share was taken over by Third World countries.

Increased production and aggressive trade practices by the European Community have had an especially dramatic impact on world trade flows. Nicholas Butler, a consultant and former food trade adviser to the United Kingdom, wrote that 20 years ago the European Community "was a rather secure market for other exporters." In the mid-1970's, the E.C. was a net importer of all major agricultural products, including 20-30 million tons of grain each year. "In less than a decade the E.C. has established itself as a significant exporter of a number of commodities, taking as much as 12 percent of the world cereal market on a regular basis. Agricultural exports now account for 30 percent of all exports from the Community, against only 9 percent in 1973" (Butler, 1986).

### What Are Our Choices?

Ultimately the question boils down to: What choice does American agriculture have?

The United States can no longer expect to focus most of its agricultural market development so heavily on Western Europe, Japan and other developed countries. The market basics simply do not support that approach; these are mature markets where people already eat well and population growth is flat.

In time, Western Europe and Japan will improve as markets for U.S. products. The upcoming Uruguay round of negotiations under the General Agreement on Tariffs and Trade (GATT) may result in improvement in the terms of trade with those areas. But there is no reason to believe that the Europeans and the Japanese will in the future provide the upward thrust to U.S. agricultural sales that they supplied in the 1970's.

In the absence of market growth in the industrialized market economies, the United States realistically has only two options:

One is to reduce planted acreage on a permanent basis in order to bring supply and demand into balance. This can be accomplished through the rigors of a free domestic market that offers little potential for expansion. Or it can be done by government sanction.

The alternative to further acreage reductions is to enlarge the marketplace by seeking new customers where opportunity exists. It is increasingly evident that this potential lies with Third World countries, with their large and growing populations and their need for improved diets and higher living levels. If that market is to be fully realized, income growth based in part on agricultural development must be an objective of U.S. policy.

## REFERENCES

### Self-Sufficiency Not the Answer

But such successes do not necessarily mean that self sufficiency is a desirable policy. Substantial gains from trade can be forgone in its pursuit. Such losses were evident in China when each province aimed to become self-sufficient in food gains. The same losses can occur if a country restricts trade in world markets. . . .

Third, the high cost of self-sufficiency has often been underwritten by grants or concessionary loans from donors. Taken in isolation, many components of each country's policies may have been logical. Taken together, however, they add up to a bias against a well-integrated world agriculture capable of capturing the full benefits from trade.

- - "Food Self-Sufficiency in Asia," World Development Report 1986, World Bank, 1986, p. 78.

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By 1960, Japan had achieved a 90 percent average self-sufficiency rate and was completely self-sufficient in a number of items that made up the traditional Japanese diet: rice, eggs, meat and fruit. Yet, during the past twenty years, self-sufficiency levels have declined to the point where, in 1980, Japan was only 72 percent self-sufficient. In the case of some items such as rice, diminished production was an intentional government response to a significant decline in the demand for rice. In the case of other items such as wheat, soybeans, and feedgrains, self-sufficiency levels were low to begin with and have fallen off dramatically.

The cumulative effect of these trends is to make Japan dependent on imports of food stuffs to meet as much as 50 percent of its demand for food. In the 1970's, this situation bothered many officials and groups who supported self-sufficiency measures and who interpreted food dependency as a threat to Japan's national security. However, others viewed low self-sufficiency levels for imported items as a cost savings to Japan for products outside the traditional diet.

- - David N. Balaam, "Self-Sufficiency in Japanese Agriculture: Telescoping and Reconciling the Food Security-Efficiency Dilemma," World Food Policies Toward Agricultural Independence (William P. Browne and Don F. Hadwiger, editors), Lynne Rienner Publishers, Boulder, 1986. p.91.

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Official government rhetoric aside, no country in the region seriously contemplates complete self-sufficiency in all food staples. Whatever the resources and potentials of each country, the economic rationality of pursuing self-sufficiency is weak so long as the principle of comparative advantage has any bearing on cropping choices. Egypt could, for example, produce most of its domestic wheat requirement, but only at the price of relinquishing most of its acreage, which is better suited to growing cotton and other higher value exportable crops. There exists no case in the Middle East of a country prepared to insulate itself from the global market economy, not even those states with close political and economic ties to Eastern Bloc countries. Nor is any country willing to accept the political and social consequences of severely restricted national consumption. Instead, the region's states have settled for a number of agricultural development strategies familiar to the Third World. These approaches are, as elsewhere, interdependent, and no single policy or combination of policies has proven thus far universally applicable or successful.

- - Marvin G. Weinbaum, "Food Security and Agricultural Development Policies in the Middle East," World Food Policies Toward Agricultural Independence, William F. Browne and Don F. Hadwiger, editors, Lynne Rienner Publishers, Boulder, 1986, p.113.

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### Third World Not Responsible for Export Declines

The U.S. Congress will consider new farm legislation in 1985 to replace the expiring Agriculture and Food Act of 1981. Many changes have occurred during the course of the 1981 Act and significant change is expected in the years ahead. Changes in U.S. agriculture have been brought about by ties to the general economy at home and abroad and links to agricultural developments abroad. A worldwide recession has slowed the demand for agricultural products in the 1980's, while global production capacity remains large. This has resulted in slow growth in global agricultural consumption and has meant increased competition from other countries for international markets. U.S. agricultural exports were hurt further by the strong dollar and higher prices for U.S. products in markets abroad.

- - James R. Donald, Chairman, World Outlook Board, "Agricultural Outlook," Annual Agricultural Outlook Conference, December 3, 1984.

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There are numerous reasons for the decline: a world recession, debt problems of several large importers, increased production by some major importers and competing exporters, export subsidies by competing countries, import barriers by other countries, the strength of the U.S. dollar, and high U.S. price-support policies.

- - Gerald Rector, Economic Research Service, Agricultural Outlook, U.S. Department of Agriculture, November 1985.

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Foreign assistance has become a scapegoat for the folding of so many farms and the downturn in agricultural exports in the U.S. The over-valued dollar, high interest rates, market distortions created by \$25 billion worth of subsidies every year, drought, the mounting debt of many third-world countries, and a slowdown of the world economy in the 1980s are the main causes of the decline in U.S. agricultural exports and farm foreclosures.

Cutting back support for agricultural development in the Third World is likely to backfire on U.S. farmers. As countries improve their ability to feed themselves and achieve higher standards of living, the market for U.S. agricultural exports grows. For example, wheat consumption worldwide is increasing more than twice as fast as population growth, mainly because consumption of the cereal increases as living standards improve.

Similarly, the demand for meat and dairy products also increases as income levels rise; many developing countries import substantial amounts of beef, pork, chicken, powdered milk, and cheese from industrial countries. Furthermore, they are purchasing growing volumes of grain to feed domestic herds.

- - Nigel Smith, Professor of Geography, University of Florida, "Foreign Aid: A Plus for the U.S. Farmers' Tally," Christian Science Monitor, December 17, 1986.

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Since its inception in the late 1950s and 1960s, the Common Agricultural Policy has had a dramatic impact on trade flows within Europe and between Europe and the rest of the world. A decade ago the community was a net importer, usually on a substantial scale of all major agricultural products.

In less than a decade the EEC has established itself as a significant exporter of a number of commodities, taking as much as 12 percent of the world cereal market on a regular basis. Agricultural exports now account for 30 percent of all exports from the community, against only 9 percent in 1973.

These figures stand in sharp contrast to the situation twenty years ago when the community as a whole, measured on the basis of either the original six members or the nine members after the first enlargement, was a relative secure market for other agricultural exporters. As recently as the mid-1970s, the community was regularly importing 20-30 million tons of grain net.

- - Nicholas Butler, "The Common Agricultural Policy and World Food Trade," World Food Policies Toward Agricultural Independence, William P. Browne and Don F. Hadwiger, editors, Lynne Rienner Publishers, Boulder, 1986, p. 47-48.

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## Development as an Export Strategy

Another long-term strategy should be Third World development. Most of the world has more than enough grain now, but higher standards of living would mean further improvements in diet. Beyond the humanitarian and world-stability aspects of that, it should mean opportunities for more U.S. exports of processed food, at greater profit than raw grain.

- - Des Moines Sunday Register "A New Look at Farm Policy,"  
Editorial, August 3, 1986.

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Expanding the global economic pie is the only way U.S. farmers can expand their own markets. Ham-stringing the poor farmers of the developing world does not serve U.S. agricultural interests, either politically or economically, let alone those of U.S. consumers and taxpayers.

- - G. Edward Schuh, Director, Agricultural and Rural Development  
Department, World Bank, "Some Healthy Competition for U.S. Farmers,"  
Washington Post, September 4, 1986.

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Contrary to conventional wisdom, the best way to achieve this is through the development of local agriculture in the developing countries themselves. Because most Third World workers are employed in agriculture, the development of this sector achieves a more even distribution of income than does the development of other sectors. And in the early and middle stages of economic development, as people have more money, the first thing they spend it on is increasing and diversifying their consumption of food.

The U.S. benefits because as developing countries grow richer, they can't meet their citizens' demands for food and must turn to imports. The paradoxical result is that successful farm development in countries often creates a demand for more imports.

- - Randall B. Purcell, Director, Curry Foundation, "Develop Their  
Agriculture to Save Ours," Wall Street Journal, January 23, 1987.

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It is not a contradiction that the United States should assist other countries to increase their exports as a means of increasing export opportunities for U.S. farmers. The apparent contradiction dissolves when the aggregate effects of economic development of the countries in the policy transition phase of development are distinguished from the effects of a single country increasing its exports of a single commodity. The opportunity cost these countries face in using their scarce capital and professional human resources to develop a full array of agricultural subsectors is very high, and they will achieve higher rates of economic growth if they organize their economies around their comparative advantages rather than achieving self-sufficiencies for their entire agricultural sector.

- - "Agricultural Policy Distortions, Economic Development, and Growth in Agricultural Trade," Unpublished paper by Lon Cesal. International Economics Division, Economics Research Service, U.S. Department of Agriculture, 1987.

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### Farmers Have Everything to Gain

It appears that the traditional net exporters to developing market economies need not worry about expansion of food production in the rapid-growth countries. Although the proportion of consumption coming from domestic production generally increased, net imports of staple food also increased.

- - Kenneth L. Bachman and Leonardo Paulino. "Rapid Food Production Growth in Selected Developing Countries: A Comparative Analysis of Underlying Trends, 1961-76," International Food Policy Research Institute, October 1979.

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Some question whether it is in the best self-interest of the United States to help other countries increase their domestic agricultural production. Their rationale has been that, if the U.S. helps other countries grow more food and non-food agricultural products, those countries will then import fewer agricultural products from the United States.

Aside from a rather selfish viewpoint, that rationale on the surface seems logical. However, ongoing research at the University of Illinois indicates that developing countries in which agricultural production is growing rapidly, import significantly more agricultural products per capita than do those where agriculture is experiencing slow growth.

- - John R. Campbell, Dean of the College of Agriculture, University of Illinois at Urbana-Champaign. Statement before the Agriculture Committee, U.S. House of Representatives, Washington, D. C., October 25, 1983.

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Some may regard the export competition of developing countries as a threat. American agriculture must take it as an opportunity. Our best developing country customers have been and will continue to be those nations who have used their comparative advantages to build export markets from which they can use export earnings to improve their food availability and quality through imports. It is the American producer who stands to gain from this growth in world trade.

- - "American Agricultural Interests and the Developing World," Thomas R. Saylor, Grain Trade Consultant, Remarks at trade and development conference, Minneapolis, May 7, 1986.

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Naturally, specific episodes of U.S. trade displacement in some products by some countries can be identified and perhaps associated with agricultural assistance. However, wider evidence shows that the burden of proof clearly rests with those who insist that agricultural assistance for poor nations is usually a bad thing for American farmers. On the contrary, it is mostly a good thing.

- - James P. Houck, "A Note on the Link Between Agricultural Development and Agricultural Imports," Staff Paper 86-26, Department of Agricultural and Applied Economics, University of Minnesota, St. Paul, July 1986.

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The conclusion to which all this evidence points is that for LDCs, increases in agricultural production are necessary for widespread income growth, which leads to increases in agricultural imports. Because of this LDCs with the faster-growing agricultural sectors were the faster-growing markets for U.S. agricultural exports. Thus, American agriculture has nothing to gain and much to lose from slowing down agricultural development in developing countries.

- - Earl D. Kellogg, Associate Executive Director of the Consortium for International Development, "Agricultural Development in Developing Countries and Changes in U.S. Agricultural Exports," Consortium for International Cooperation in Higher Education, March 1987.

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The agricultural community should promote economic development efforts through bilateral and multilateral institutions such as the Agency for International Development and the World Bank. It is especially important that aid be devoted to self-sustaining and productive projects that increase the incomes of a broad segment of the population. Instead of opposing increased funding for these institutions, the agricultural community should lead the way for further support.

- - George E. Rossmiller and M. Ann Tutwiler, director and research assistant respectively, National Center for Food and Agricultural Policy, Resources for the Future, "U.S. Agriculture and Third World Development: The Critical Linkage," Curry Foundation, Washington, D. C., 1987.

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Stop bellyaching about spending money overseas to develop poor countries' agriculture. In a study of 16 rapid-growth countries, agricultural production expanded by a factor of 1.5 and net agricultural imports grew by 2.3! The money more than returns itself. Our agricultural export salvation, if there is any, lies with these developing countries. It is absolutely, definitely and positively in your best interests to see rapid growth in these countries in Asia and Africa.

- - Richard Krumme, Editor, Successful Farming, May 1987

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## 8. RESEARCH STUDIES: A SUMMARY

A number of studies have demonstrated that agricultural development in low and middle income countries usually leads to a growth in demand for food imports. While government policies and other variables in those countries are also important, agricultural development is in most cases essential to income growth. When such growth occurs, the resulting demand for more, better, and more varied diets is usually beneficial to exporting countries, especially the United States. A recent USDA study (Christiansen) obtained similar results but found further that any likelihood of increased competition in third country markets is outweighed by the growth in export opportunity.

Most of the authorities recognize that there are exceptions -- that in specific instances U.S. exporters may lose sales because of competitive situations that may be related to development assistance. They conclude, however, that on the whole U.S. farmers stand to benefit from trade growth growing out of agricultural growth in low and middle income countries.

### Bachman and Paulino

A 1979 study by Kenneth Bachman and Leonardo Paulino for the International Food Policy Research Institute (IFPRI) found that the 16 developing countries with the fastest growth rates in basic food production in 1961-76 more than doubled their net food imports during that period. Annual net staple food imports in those countries rose 133 percent between 1961-65 and 1974-76. According to IFPRI, "these data demonstrate that although it is possible for rapid growth, low income countries to achieve impressive increases in basic food production, it is unlikely that such production will keep pace with the rate of growth in demand for food during this phase of development" (Bachman and Paulino, 1979).

## Mackie

A 1983 study by Arthur B. Mackie of USDA's Economic Research Service concluded that the general economic development of a country and its ability to pay for food imports depend on its ability to develop a strong agricultural base for its own expanding economy. An analysis of about 100 countries showed that, as per capita income rose 10 percent, countries with less than \$1,000 per capita income increased agricultural imports by 12 percent in the early 1960's, 15.4 percent in 1971-73, and 8.2 percent in 1979-81. Higher-income countries increased imports by only 5 percent for each 10 percent gain in per capita income.

The lower income countries recorded even sharper increases for products imported from the U.S. alone. These countries increased agricultural imports from the United States by 32.9 percent for each 10 percent rise in per capita income in the early 1960's; 19.3 percent in 1971-73, and 13.6 percent in 1979-81. Mackie cited United Nations studies showing that in India 60 cents of every \$1 rise in family income was spent for food (Mackie, 1983).

## Kellogg

A study by Earl D. Kellogg of the Consortium for International Development at Tucson, Arizona, found that 18 developing countries with the most rapid growth rates in per capita food production between 1970 and 1982 also increased agricultural imports at a more rapid rate than a group of 13 developing countries reporting the slowest growth in food production. The group of 18 increased total agricultural imports at a rate 34 percent faster than the group of 13. The 18 increased corn imports 97 percent faster and soybean and soybean product imports 257 percent faster than the slower group.

Kellogg, then at the University of Illinois, concluded that: "Developing countries continue to be the best potential growth markets for U.S. agricultural exports. To realize this potential, they must achieve economic growth that results in increased per capita incomes and foreign

exchange availability. Because of the size and economic importance of the agricultural sector in developing countries, it must contribute to this economic growth" (Kellogg, 1985).

### Lee and Shane

A 1985 study by John Lee and Matthew Shane of the Economic Research Service, U.S. Department of Agriculture, found that during the 1970's U.S. agricultural exports to the developing countries grew at an average annual rate of almost 10 percent compared to a 2 percent growth rate to the industrial countries. According to the study, "evidence suggests that those low income countries that achieve growth by exporting products in which they have a comparative advantage generally become major importers of agricultural products in which they have little comparative advantage." The authors argue that "growth in the low and middle income countries is the main hope for significant intermediate and long-term expansion of U.S. farm exports and for the efficient utilization of the nation's agricultural resources."

Lee and Shane took special note of Brazil and Malaysia, two countries often cited as U.S. competitors created by U.S.-supported agricultural development. They found that both countries increased agricultural imports substantially during a period of domestic agricultural growth, 1967-1983. Malaysia is the world's leading exporter of palm oil but a consistent net importer of grains and an expanding market for U.S. agriculture. Brazil, since 1978, has become an important net exporter of farm products but a significant importer of grains. "These two country examples," according to Lee and Shane, "indicate that economic development in the developing countries along comparative advantage lines is generally complementary rather than competitive with U.S. export interests" (Lee and Shane, 1985).

### Houck

James P. Houck of the University of Minnesota, using 1983 and 1984 data for 44 countries, found a relatively close association between agri-

cultural productivity, per capita GDP, and per capita cereal imports. Houck, in a 1986 research note, concluded that agricultural productivity is associated with GDP and that, "overall, a 10 percent increase in per person GDP from country to country was associated with a 7 to 15 percent increase in the volume of cereal imports" (Houck, 1986). According to Houck, "the lessons are clear, at least for the low income nations on this planet. In particular, a strong case can be made for the idea that advances in agricultural productivity are associated with increases in imports of cereals and other agricultural products."

### Paarlberg

In a study for the Curry Foundation, Robert Paarlberg of the Center for International Affairs, Harvard University, found that in a 10-year period, lower-middle and upper-middle income countries expanded grain imports much more rapidly than did low income countries. From 1972-73 to 1982-83, low income countries increased total grain imports by 40 percent, while lower-middle and upper-middle income countries increased grain imports by 130 percent and 102 percent respectively, from much higher bases. Paarlberg noted that the upper middle income countries increased imports of coarse grains by "roughly 300 percent, indicating that a significant increase in animal feeding, driven by dietary diversification, was well underway."

The study concluded that "there need not be a contradiction between the goal of promoting Third World farm development and the goal of promoting U.S. farm trade expansion. With the proper policies in place, these two goals can be successfully pursued side by side" (Paarlberg, 1986).

### Kellogg, Kogl, and Garcia

Earl D. Kellogg, Richard Kogl, and Philip Garcia analyzed the performance of 65 developing countries from 1970 to 1982. For those LDCs experiencing growth in per capita agricultural production, a positive and significant correlation was found not only between such production and per capita agricultural imports but also between such production and per

capita income. Also in this study, per capita income emerged as the most important variable affecting agricultural imports; increases in income spurred the demand for commercial agricultural imports and services. According to the authors, "no significant evidence from this analysis was obtained that indicated increasing per capita agricultural production caused a decline in imports of agricultural goods and services of developing countries" (Kellogg, Kodl, and Garcia, 1987).

### Christiansen

Robert E. Christiansen of USDA's Economic Research Service investigated the relationship between economic development and the consumption, production and trade of major export commodities, including grains, oilseeds, and meat. The study used cross-sectional data from 67 countries in 1977 and 66 countries in 1980. The results suggest a strong positive, and the author believes causal, relationship between development and the value of agricultural imports. The study demonstrates that economic growth creates more opportunity for imports into those countries than for export competition in other countries.

The study found no systematic relationship between development and agricultural exports. "This is not to say that developing countries will not export agricultural commodities as part of their development strategy, but rather that exports of the commodities studied herein will not be the mainstay of sustained economic growth," the study concluded. As for corn and soybeans, the results demonstrate that developing countries will increase their imports as development proceeds.

"The evidence indicates," according to the author, "that successful development efforts, which include sustained economic growth, are the strongest catalysts for expanding world agricultural trade. For better or worse, the prospects of the two are inextricably intertwined" (Christiansen, 1987).

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K. L. Bachman and L. A. Paulino, "Rapid Food Production Growth in Selected Developing Countries: A Comparative Analysis of Underlying Trends: 1971-76", Research report no. 11, International Food Policy Research Institute (IFPRI), Washington, D.C., October 1979.

Arthur B. Mackie, "The U.S. Farmer and World Market Development," U.S. Department of Agriculture (ERS), October 1983.

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E. D. Kellogg, Richard Kodl, and Philip Garcia, "The Effects of Agricultural Growth on Agricultural Imports in Developing Countries," American Journal of Agricultural Economics, v. 68, no. 5, December 1986.

Robert D. Christiansen, "The Impact of Economic Development on Agricultural Trade Patterns," U.S. Department of Agriculture (ERS), January 1987.

## 9. COUNTRY EXAMPLES

In country after country, agricultural growth is regarded as an essential factor in economic development and in the country's emergence as an agricultural importer. The President's Task Force on International Private Enterprise reported in 1984: "To an extraordinary degree, economic development in the Third World depends on agriculture" (President's Task Force, 1984).

Following are brief case studies of three countries that now are among the top ten U.S. agricultural customers and three that are often cited as "lost markets" and competitors because they received development assistance.

### South Korea

In the 20 years 1960-1980, the Republic of Korea more than doubled its farm production, based partly on U.S. and World Bank loans to finance agricultural development and infrastructures. Between 1965 and 1980, South Korea's labor force declined from 56 percent agricultural to 36 percent agricultural, and Korea transformed itself from a largely subsistence agricultural economy into an industrial country able to import large quantities of food. Since 1978, South Korea's purchases of U.S. farm products have been in a range of \$1 billion to \$2 billion a year, compared with \$171 million in 1970. South Korea was U.S. agriculture's fifth largest export market in 1986.

Imports of U.S. grains have made possible a substantial change in Korean diets. The U.S. Feed Grains Council reported in 1983 that, in the preceding 10 years, the average South Korean had increased pork consumption from 2600 grams per year to 6800, poultry consumption from 1500 to 2700 grams, and beef consumption from 1300 to 2900 grams. Similar increases were recorded in milk and egg consumption.

According to the U.S. Feed Grains Council, "South Korea is one country that has made the transition from a primitive agriculture to a modern agricultural sector, and in the process has shifted rapidly from being an economically underdeveloped nation to one with a viable industrial economy. We at the U.S. Feed Grains Council played a role in that shift by helping the Koreans to develop a viable animal agriculture sector" (Stolte, 1983).

### Taiwan

In the early 1950's, Taiwan was a net grain exporter. In the subsequent three decades, Taiwan's food production increased very rapidly -- yet that country now imports 60 percent of all the cereals it consumes (Paarlberg, 1987). When the Nationalist Chinese transferred their government from the mainland to Taiwan in 1949, over 60 percent of the island's workers were employed in agriculture and over 40 percent of its GDP originated in agriculture. Since that time, those percentages have declined to below 20 percent and 10 percent respectively.

In the process, Taiwan increased its food production substantially and became a major industrial exporter. As per capita income and real wages increased, food consumption shifted to less rice and other staples and more meat, fish, dairy products and fruits and vegetables. Food imports increased, and since 1979 Taiwan has been a market for \$1 billion or more each year in U.S. agricultural products, compared with \$114 million in 1970. In 1986, Taiwan ranked seventh among U.S. agricultural export markets.

### Japan

Modern Japan has its roots in an agriculture-based development strategy going back to the Meiji Restoration in 1868. With the end of the feudalistic Tokugawa regime at that time, the Japanese initiated a program of increased yields per unit of land, based on scientific innovation and improved farming practices. Between 1880 and 1920, rice yields in Japan increased by some 65 percent, and most other grain yields rose by

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80 percent or more. Increased farming efficiency, together with the lifting of feudal restrictions on labor mobility, allowed a movement of cheap labor into urban areas and also a growth in rural industry. These changes, along with expanded savings generated by agriculture and transferred to non-agricultural sectors, were the basis for industrialization in Japan.

During the U.S. occupation in 1945-52, Japan's food situation was aided by a U.S.-backed land reform and by U.S. food aid. Japan was an early recipient of food shipments under Public Law 480, enacted in 1954. Meanwhile, Japan began a period of rapid industrial growth that has continued. Industrial production expanded at an annual rate of 13 percent in the 1960's and 5.7 percent in the 1970's. By 1981, Japan's industrial and service sectors accounted for 96 percent of the country's gross domestic product.

David Balaam, of the University of Puget Sound, points out that agriculture continued to underwrite the industrialization of Japan after World War II and into the early 1960s. "After 1955, rising per capita incomes, population growth rates, and changing tastes increased the demand for commodities Japan had to import -- namely, fruits, meat, soybeans and wheat as well as feed grains for (as yet) small livestock industries" (Balaam, 1986).

In the process, Japan has become U.S. agriculture's largest single country export market by a wide margin, accounting in recent years for 15-17 percent of all U.S. farm exports. As historians have noted, Japan was in 1955 the largest recipient of U.S. aid and by 1971 the largest commercial customer for U.S. food exports.

## Brazil

Brazil, a developing country that has established itself as an agricultural exporter especially of soybeans and soybean products, is now a principal focus of agricultural groups critical of U.S. development policy. Between 1970 and 1981, Brazil increased its agricultural exports

by 69 percent and emerged as a strong competitor in the export market for some commodities, especially soybean meal and oil. During that time, however, Brazil dramatically increased its imports of U.S. agricultural products, in the process becoming a commercial customer instead of predominantly a food aid recipient.

In 1970/72, U.S. farm exports to Brazil amounted to an average of only \$49 million, and 64 percent of that was concessional shipments under U.S. government programs. By 1980/82, U.S. farm exports had increased to \$706 million (constant U.S. dollars), and this was virtually all (99.9 percent) commercial sales for dollars. In the 1980's, U.S. agricultural exports to Brazil have averaged nearly a half billion dollars. American producers of grains, beef and other commodities have benefitted from improved purchasing power in Brazil.

Recent studies of soybean development in Brazil discount the impact of international investment in comparison to basic economic and market trends. Brazil was poised for a sharp advance in soybean production in the early 1970's when world commodity prices began a runup, the result of reduced grain and protein supplies in the U.S. and other countries, Soviet purchases, the Peruvian fishmeal failure, and global inflation.

Carlos Santana, in a 1984 doctoral dissertation at the University of Minnesota, concluded that the following factors contributed most significantly to the growth in Brazilian soybean production: (1) Relative prices between soybeans and competing crops favored soybeans. (2) The Brazilian government paid domestic producers to replace old coffee trees with other crops. (3) Brazilian policies favoring wheat spilled over into soybeans because the two were commonly double-cropped in Rio Grande do Sul. (4) Brazil soybeans benefitted from U.S. export embargoes, increased world soybean prices, growth in Brazil's poultry industry, domestic credit policies, and the country's growing demand for soybean oil as food (Santana, 1985).

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Other analysts discount the influence of U.S. embargoes on Brazil's development, but all recognize the impact of higher market prices. A 1986 study by Masahiko Gemma at the University of Minnesota concluded that "Brazilian farmers have been responding significantly to favorable soybean prices (Gemma, 1986).

A 1986 study at the University of Arizona emphasized the importance of broader economic conditions. That paper, by Merle D. Faminow and Jimmie S. Hillman of the Department of Agricultural Economics, also argued that, while Brazilian government policies did much to shape the soybean industry in that country but that those policies were not dominated by export objectives. "Without these policies it is entirely possible, and perhaps likely, that Brazilian soybean production and trade would be larger today than it is!" (Faminow and Hillman, 1986).

(It is noteworthy that American soybean growers responded to some of the same economic forces that stimulated soybean production in Brazil. Faminow and Hillman observed that "the rapid expansion of the Brazilian soybean sector was matched by an impressive increase in U.S. production. A rapidly growing market for soybean products accommodated these large increases." U.S. soybean prices more than doubled in three years -- from an annual average to farmers of \$3.03 per bushel in 1971 to \$6.64 in 1974, and harvested acreage increased by a third. By 1980 the annual average price to farmers had climbed to \$7.57, and American producers were harvesting double the acreage of the mid-1960's.)

The impact of outside aid and investment in Brazil's soybean industry becomes insignificant when compared to the larger events noted above. Altogether, U.S.A.I.D. assistance to Brazil specifically for soybeans has totaled less than \$1 million. The A.I.D.-funded International Soybean Program (INTSOY) at the University of Illinois has cooperated with Brazilian and Argentine research programs, but to date no varieties from that cooperation are commercially used in those countries.

## China

The reduction in China's imports of wheat and corn in the 1980's is as much a result of policy decisions as of the increase in China's grain production. Much has been made of China's new role as a corn exporter, but this appears to relate primarily to China's foreign exchange needs and its lack of a well-organized internal market system. In 1985, for example, China's corn production declined by 13 percent and internal shortages resulted, yet China continued to export corn for foreign exchange reasons.

Many observers think that, with improvements in China's foreign exchange position and changes in its marketing system, the country will become a major importer of grains and other products. In fact, China has returned to the U.S. corn market in 1987, and during the spring bought 1 million tons of American wheat. The Economic Research Service (USDA) expects China's agricultural surplus to decline substantially in 1987. With higher corn and wheat sales, USDA estimates U.S. agricultural exports to China in fiscal 1987 at \$230 million, well above the \$85 million recorded the preceding year (Economic Research Service, 1987.)

According to USDA's Foreign Agricultural Service, China's seventh five-year plan (1986-90) will emphasize livestock and poultry production. "As plans for livestock and poultry production are realized, there will be a huge demand for food grains -- both imported and domestic -- to meet annual producers' needs" (Foreign Agriculture, 1985).

## India

India is often mentioned as a country that has become an agricultural "lost market" as a result of international assistance and the Green Revolution. Actually, although India is a small net exporter of wheat, it is an importer of many other agricultural products. Three points need to be mentioned:

(1) Most of the displaced imports were food aid shipments subsidized by the U.S. under Public Law 480 (Food for Peace). During the 1960s and early 1970s, India was the world's largest recipient of food aid.

(2) India still has millions of poor and undernourished people, and much of the country's seeming self-sufficiency traces to their inability to buy. According to the U.S. Department of Agriculture, "nearly 50 percent of the population still cannot afford to purchase a nutritionally adequate diet" (USDA/ERS, 1985).

(3) India is not expected to become a major competitor in the international wheat market despite its increased productivity. According to Earl Kellogg, "If the millions of poor and undernourished Indians should achieve substantial increases in income, India's current food grain posture might be transformed" (Kellogg, 1987). G. Edward Schuh makes the point more bluntly that India may be technically self-sufficient but "there are hundreds of millions of people who are malnourished" there (Bretton Woods Committee, 1987).

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To an extraordinary degree, economic development in the Third World depends on agriculture. This sector provides sustenance, jobs, and foreign exchange. More than two-thirds of the developing world's people live in rural areas and most of them work at jobs related to agriculture or agribusiness.

- - The President's Task Force on International Private Enterprise, The Private Enterprise Guidebook, December 1984, p. 97.

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### South Korea

South Korea is one country that has made the transition from a primitive agriculture to a modern agricultural sector, and in the process has shifted rapidly from being an economically underdeveloped nation to one with a viable industrial economy. We at the U.S. Feed Grains Council played a role in that shift by helping the Koreans to develop a viable animal agriculture sector.

The Koreans have long fed poultry and swine because they knew they would get the most food in the shortest time-period and at least cost with chickens and hogs. But gradually they also have moved into feeding dairy and beef animals. During the last ten years alone the average South Korean has increased his or her pork consumption from about 2,600 grams per year to 6,800; poultry consumption from about 1,500 to 2,700 grams; and beef consumption from about 1,300 grams to 2,900 grams. Today, the average Korean eats 116 eggs annually, compared with only 74 ten years ago. Their youngsters enjoy 16,000 grams of milk annually, compared with only about 3,000 a decade ago. All of this has occurred despite an 8 percent increase in human population during that decade.

Along with this has come greatly increased income for Korean farmers; jobs for thousands of Koreans in dressing and packing plants, in the transportation and food processing industries, in bulk handling and storage plants; and also foreign exchange from exporting. Today Korea pays its bills, is one of the top U.S. markets for agricultural commodities, and is a strong and viable defense partner for the U.S.

- - Darwin E. Stolte, President, U.S. Feed Grains Council, Statement to Commission on Security and Economic Assistance, Washington, D.C., July 12, 1983.

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## Taiwan

Thirty-five years ago, before Taiwan's own agricultural and industrial development took off, the island had only a meager diet and was still a significant net exporter of food staples. But then Taiwan imposed a sweeping land reform, it received generous quantities of foreign aid, it set up rural cooperatives, invested in rural infrastructure, got its prices right, and devalued its currency. The result was a successful agricultural revolution, which pushed up income, in broad-based fashion, followed quickly by a successful industrial revolution, which pushed income even higher. Diets began to improve rapidly, per capita consumption of animal products increased, and Taiwan began to import larger quantities of animal feed, transforming itself in the process from a net exporter of food staples into a large net importer. Taiwan now imports roughly 60 percent of its total food staple consumption. Last year Taiwan purchased \$1.1 billion worth of U.S. agricultural products in particular, mostly corn, soybeans, and livestock. South Korea purchased \$1.3 billion worth of farm products from the U.S., including corn, soybeans, livestock, wheat, flour, and cotton.

- - Robert L. Paarlberg, Center for International Affairs, Harvard University, "Is Agricultural Success in Poor Countries Good or Bad for U.S. Agriculture?" Testimony before Subcommittee on International Institutions and Finance, House Committee on Banking, Finance and Urban Affairs, May 20, 1987.

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## Japan

An important point to make, however, is that until the 1930s, the efficiency of Japan's agricultural production process propelled the development of the economy. Agriculture demanded fewer resources than did industry, and the flow of most resources moved out of agriculture and into the industrial section.

Agriculture continued to underwrite the industrialization of Japan after the war until the early 1960s.

Although agricultural recovery was achieved by the mid-1950s, by the early 1960s, industrial recovery imposed a new structure of consumer demands for agricultural commodities. Rice demand was met rather easily and surpluses began to accumulate, driving down farm prices. After 1955, rising per capita incomes, population growth rates, and changing tastes increased the demand for commodities Japan had to import -- namely fruits, meat, soybeans and wheat as well as feedgrains for (as yet) small livestock industries.

- - David N. Balaam, "Self-Sufficiency in Japanese Agriculture: Telescoping and Reconciling the Food Security-Efficiency Dilemma," World Food Policies Toward Agricultural Independence, William P. Brown and Don F. Hadwiger, editors, Lynne Rienner Publishers, Boulder, 1986, p. 93-94.

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## Brazil

First, relative prices between soybeans and competing crops favored soybeans during that decade (the 1970's). Moreover, the real price of soybeans in Brazil rose, while the real domestic prices of competing crops fell.

Second, the Brazilian government, facing an excessively large world production of coffee in the 1960's, paid domestic producers to replace old coffee trees by other crops of their own choosing. As a result of that policy and of the relative profitability of soybeans, large numbers of farmers planted the new oil seed crop. This was especially the case in the state of Parana, where 7.4 percent of the soybeans produced during the 1970-73 period came from areas formerly planted to coffee.

Third, the growth of soybean production is also correlated with Brazilian wheat policy. This is because until fairly recently, a relatively large number of producers double cropped wheat with soybeans in Rio Grande do Sul. Therefore, the artificial stimulus given to wheat at that time, especially the credit subsidies for the acquisition of machinery and fertilizer, spilled over into the soybean sector and thus promoted its growth.

Fourth, Brazil's soybean sector also benefited from U.S. export embargoes on soybeans in the early 1970's. Finally, the dramatic increase in the world price of soybean oil in 1973 and 1974, the growth of the Brazilian poultry industry, the domestic agricultural credit policy, and the large and growing domestic market for soybean oil (mainly for cooking purposes) also contributed to the rapid growth in soybean production.

- - Carlos Santana, "The Impact of Economic Policies on the Soybean Sector of Brazil: An Effective Production Analysis" (PhD. Thesis, University of Minnesota, 1984), University Microfilms International, Ann Arbor, Michigan, 1985, pp. 29-30.

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Although the U.S. and Brazil are competitors in the international market for soybeans and soybean products, the rapid expansion of the Brazilian soybean sector was matched by an impressive increase in U.S. production. Soybean production in the United States expanded from approximately 19 million tons in 1965 to over 50 million tons in 1985, an increase of 31.6 million tons. Although the U.S. share of world soybean production decreased from the 70 percent range through much of the 1960's and early 1970's to the 55-60 percent range in the 1980's, a rapidly growing market for soybean products accommodated large increases in the production of both countries (p. 3).

Clearly, however, the rapid price rise in world soybean and soybean product markets in 1973 can be credited with initiating additional growth in soybean production. Brazil's soybean production and exports, along with derivative products, continued to increase dramatically through the 1970's. This response, we argue, is largely due to underlying economic forces.

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This should not be interpreted as implying that Government action was a sterile factor. To the contrary, the Brazilian government intervened with production and trade policies that shaped, to a large extent, the development of the industry. However, the general thrust of these policies was not dominated by export market penetration objectives. Service of a growing domestic market for oilseeds, promotion of a value-adding processing industry, and other economic goals (debt maintenance, social policies) often dictated soybean policy. Without these policies it is entirely possible, and perhaps likely that Brazilian soybean production and trade would be larger today than it is! (pp. 33-34).

- - Merle D. Faminow and Jimmie S. Hillman, "Brazil's Response to the U.S. Soybean Embargo," Department of Agricultural Economics, University of Arizona, August 1986.

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Estimated acreage and yield response equations are given for the three soybean states from 1971 to 1977. The results, which indicate a very high price elasticity of the soybean supply in Brazil, imply that Brazilian farmers have been responding significantly to favorable soybean prices. The coefficient of expectation indicates that Brazilian soybean supply was influenced more by the latest change in the minimum price of soybeans than by farmers' expectation of long-run "normal" prices. In addition, this study demonstrates that the minimum price policy of the Brazilian government for soybeans has had a major influence on the expansion of Brazilian soybean production.

- - Masahiko Gemma, "The Competitive Position of the Brazilian Soybean Industry," Staff paper P86-51, University of Minnesota, November, 1986, p.23.

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### China

China's Seventh Five-Year Plan (1986-90) will emphasize livestock and poultry production. Consequently, the shift in U.S.-Chinese trade will reflect this emphasis of turning grain into animal protein.

Long-range targets call for tenfold and twentyfold production increases for some livestock products by the year 2000.

As plans for livestock and poultry production are realized, there will be a huge demand for food grains -- both imported and domestic -- to meet animal producers needs.

- - Foreign Agriculture, "Breeds and Feeds: The Future of U.S.-Chinese Trade," by Norman Kallemyn and Terry Taylor, April, 1985.

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Some analysts believe it is only a matter of time before China steps up food imports. "That's such a huge market," said Al Watkins of the Joint Economic Committee. "As they start growing and raising more cattle, their imports should start growing."

- - Bretton Woods Committee, Special Report, "U.S. and Third World Farmers: Can They Prosper Side-by-Side?" 1987.

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China's agricultural trade surplus is expected to decline substantially in 1987. Export value is likely to decline, while 1987's import value will be greater than in 1986. China began buying U.S. corn early in the year, and this spring purchased 1 million tons of wheat under the Export Enhancement Program, the first wheat sale since 1985. The current forecast for fiscal 1986/87 exports to China is about \$230 million, well above the \$88 million of 1985/86. In 1986, the agricultural trade surplus expanded by 6.3 percent. China's total grain output in 1987 is forecast at 401 million tons, 10 million above 1986 but 6 million below the 1984 record. Grain output in 1986 increased 12 million tons over the previous year, reaching 391 million tons. Wheat production was a record high 90.3 million tons.

- - China Situation and Outlook Report summary, U.S. Department of Agriculture, ERS, June 25, 1987.

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### India

Achievements in food output, however, have not been uniform across commodities, nor have dietary standards improved greatly. There is now a big unmet deficit in pulses, and India has become the world's largest importer of edible oils. Both commodities are important in the Indian diet. And, while the Government operates a large distribution system for subsidized foods and widespread starvation no longer occurs even during severe droughts, nearly 50 percent of the population still cannot afford to purchase a nutritionally adequate diet. Promising gains in pulse and oilseed production have been achieved since 1980, but inadequate nutrition awaits a solution, perhaps through expanded distribution and continuation of India's recent stronger economic growth.

- - U.S. Department of Agriculture, Economic Research Service, Agricultural Outlook, October 1985.

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India is often cited as a developing country that has begun exporting agricultural commodities -- in this case, wheat. This is not because she has met all of her internal food needs but because of a lack of effective demand and poor performance in the nonagricultural sector. If the millions of poor and undernourished Indians should achieve substantial increases in income, India's current food grain trade posture might be transformed. Also, India imports many agricultural products even though she is a very small net exporter of wheat.

- - Earl D. Kellogg, Associate Executive Director of the Consortium for International Development, Tucson, "Agricultural Development in Developing Countries and Changes in U.S. Agricultural Exports," Consortium for International Cooperation in Higher Education, March, 1987.

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India today is reaping the benefits of the Green Revolution of the mid-1960's. It now grows all its own wheat, and has even begun exporting some of that production.

But while India "may be technically self-sufficient, and even export... there are hundreds of millions of people who are malnourished" there, said G. Edward Schuh.

If more Indians earn more money and can afford more and better-quality food, India might boost food imports.

- - Bretton Woods Committee Special Report, "U.S. and Third World Farmers: Can They Prosper Side-by-Side?" 1987.

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