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Is the World Facing a Food Crisis?

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In 1985, at the height of the African famine, only a few people voiced concern about the adequacy of the world's food supply. Now, without a major crisis, many—including environmentalists, economists, and policymakers—believe a world food shortage is looming.

Some developing countries are unable to maintain adequate food supplies through either production or commercial imports. Therefore, they need aid from overseas to meet their food deficits. (A food deficit exists if a country's total food use is greater than its domestic production and capacity to commercially import food.)

Why are these countries short of food? Do the current disturbances in world food markets foretell a crisis in world agriculture in the next few decades? Recent ERS analyses yield some disquieting observations:

In many developing nations, food deficits have grown despite improving food production. Use of cereal grains in 54 less-developed countries grew 34 million metric tons (mt) between marketing years 1984/85 and 1988/89 to 351 million (table 1). Cereal import requirements—food use less domestic production—rose less than 5 million mt during the period, attesting to success in increasing agricultural production. Nevertheless, the cereal deficit in 1988/89 was 17 million mt, compared to 12 million in 1984/85, at the height of the African famine.

Some countries achieved solid gains in production in the 1980's. In India, cereal output in 1987/88-1988/89 averaged 135 million mt, compared to 120 million early in the decade. Similarly, Indonesia moved from 26 million to 31 million mt of cereal production.

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Table 1. Cereal Use Has Outstripped Production in Many Developing Countries

Region	Cereal situation	
	1984/85	1988/89
	<i>Thousand metric tons, cereal equivalent</i>	
North Africa		
Cereal use	25,016	27,956
Cereal production	13,075	15,705
Import requirements	11,941	12,251
Import capacity	8,626	7,771
Cereal deficit	3,315	4,480
Sub-Saharan Africa		
Cereal use	55,334	59,497
Cereal production	48,241	54,116
Import requirements	7,093	5,381
Import capacity	1,943	2,386
Cereal deficit	5,150	2,995
Asia		
Cereal use	225,968	252,917
Cereal production	221,256	241,772
Import requirements	4,712	11,145
Import capacity	2,249	4,255
Cereal deficit	2,463	6,890
Latin America		
Cereal use	10,840	10,928
Cereal production	7,032	7,338
Import requirements	3,808	3,590
Import capacity	2,582	1,207
Cereal deficit	1,226	2,383
All food-deficit countries¹		
Cereal use	317,158	351,298
Cereal production	289,604	318,931
Import requirements	27,554	32,367
Import capacity	15,400	15,619
Cereal deficit	12,154	16,748

¹Fifty-four developing countries in Africa, Asia, and Latin America.

Source: *World Food Needs and Availabilities*, ERS, USDA, various issues; and supporting data.

But for many nations, production growth has been far too slow, and recent high output is just the product of favorable weather.

The ability of developing countries to import food commercially has dropped.

The 1980's were a major economic disappointment for most developing nations. Economic growth slowed dramatically, and countries piled up debt. In many food-aid-dependent countries, the economy declined sharply. Poor export earnings and the increasing cost of debt servicing curtailed the amount of foreign exchange available to buy food imports, raising the food deficit in many regions.

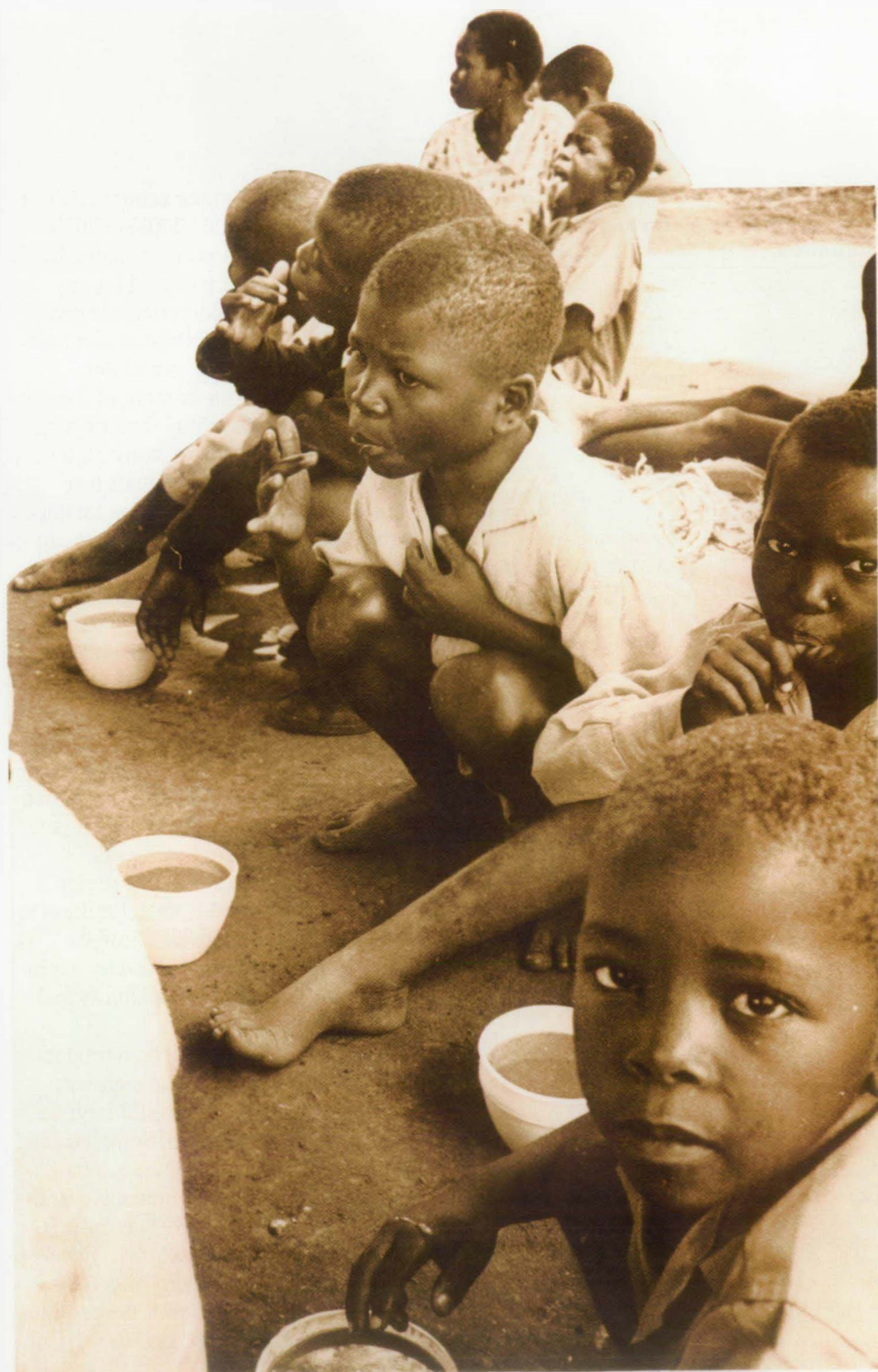
In Asia, import requirements rose from 4.7 million to 11.1 million mt during 1984/85-1988/89, while import capacity grew by only 2 million mt. This caused the food deficit to expand from 2.5 million to 6.9 million mt.

Bangladesh's cereal output in 1988/89 was 16.6 million mt, the same as in 1984/85. But total use rose and import requirements increased from 1.1 million to 3.2 million mt, outstripping commercial import capacity. The country's food deficit grew threefold to 1.6 million mt.

Although import requirements declined in Latin America, the region's food deficit increased from 1.2 million to 2.4 million mt as commercial import capacity was more than halved by diminished foreign exchange availability and higher cereal prices.

In Sub-Saharan Africa, both production and import capacity have grown. However, food deficits are still large in countries such as Ethiopia, Somalia, and Mozambique. In Mozambique, total food use and import requirements went up. Production in 1988/89 was only slightly greater than in 1984/85. Because commercial import capacity was only one-third of 1984/85's level, the cereal deficit climbed from 480,000 to 637,000 mt.

Developing-country cereal import bills and the cost of food aid are greatly influenced by world cereal stocks, particularly wheat, the principal food aid commodity. In the last few years, wheat output has declined and surplus stocks have shrunk to barely adequate levels in



The amount of international food aid has dwindled in the last few years.

major food producing and supplying nations. Better weather and larger plantings meant a record 1989 crop for most wheat exporting countries, but in the United States, unfavorable weather dam-

aged the winter wheat crop and total wheat production rose only slightly.

In marketing year 1988/89, lower beginning stocks nearly balanced the larger wheat harvest in exporting nations,

so total supplies showed little change. However, the world consumed more wheat than it produced, and stocks continued to decline. Fortunately, initial estimates of 1990 wheat production in major exporting countries suggest the rundown in stocks may finally be ending.

- Exceptionally low world cereal stocks, especially wheat, have caused international prices to rise sharply. U.S. wheat prices for 1988/89 were 45 percent above 1987/88. The world price for wheat in 1988/89 was \$165 per metric ton, close to the levels of the early 1980's. Higher cereal prices have eroded countries' import capacities, already depressed by deteriorating financial conditions.

Low prices in 1986/87 and 1987/88 had provided considerable relief to financially strapped countries purchasing wheat on the world market. (Foreign exchange earnings and the price of cereal imports determine how much food a country can import commercially.) However, these lower world prices—averaging only \$115 per mt during the 2 years—were the temporary result of large stocks and aggressive competition among exporting nations.

- Countries' food deficits translate into food crises when assistance fails to arrive, and the amount of international food aid has dwindled in the last few years. The Food and Agriculture Organization (FAO) estimates that world cereal aid shipments in marketing year 1988/89 were less than 9.8 million mt, the lowest level since 1983/84. Projected 1989/90 aid from all donors is 8.3 million mt.

Tight government budgets and high market prices have contributed to the declines. For example, in the United States, higher costs reduced the tonnage donated under Public Law 480 by about 20 percent even though the fiscal 1989 food aid budget of \$1.5 billion was similar to 1988. Government commodities shipped overseas under the Section

416(b) donation program also declined from nearly 1.8 million tons in fiscal 1988 to approximately 1 million tons.

Are diminished food aid budgets a sign that donors, such as the United States, Canada, and the European Community, are unwilling to pay the cost of keeping the wolf from the door of hungry nations? Probably not. What they signal is an unwillingness by donors, who have economic problems themselves, to provide food security to countries that are only financially troubled. The reappearance of famine would quickly prompt additional food assistance.

Will Food Shortages Last?

Over the years, people have used current conditions to predict the future behavior of world agriculture. For instance, the development and rapid spread of high-yielding cereal varieties in the 1970's inspired predictions of the end of famine. Then, the global scarcity of cereals in the early 1980's led to predictions of ever-growing markets for U.S. agricultural exports. (*See The Changing Nature of World Agriculture for more information on the public's perceptions of agricultural conditions.*) Should people interpret the present stresses in world agriculture to mean that food crises are imminent? What are the causes of current food deficits, and how enduring are they?

Weather greatly influences cereal production, but its effects on individual countries are temporary. In a reversal of recent events, weather could improve production in the United States and diminish output in developing countries.

Low cereal stocks are largely the consequence of decreasing Canadian and, more predominantly, U.S. holdings. Both countries experienced major crop shortfalls in 1988 because of drought. Aggressive export competition among major grain producers, particularly the

United States and the European Community, also helped draw stocks down.

As cereal production increases in the major exporting countries, so will stocks. Had favorable weather accompanied the larger acreage planted in 1988/89, stocks would have already turned up. How swiftly they recover, and to what levels, will depend in part upon the multilateral negotiations on agriculture now taking place under the auspices of the General Agreement on Tariffs and Trade (GATT). (*See National Food Review, October-December 1989, for information on the GATT negotiations.*)

There is little doubt that major food exporting nations will continue to produce more than domestic requirements. Thus, other countries can rely on these exporters for both commercial imports and emergency supplies. Cereal stocks in these countries have an impact around the world.

Stock levels are the principal determinant of world cereal prices. For example, in the 1970's and late 1980's when the ratio of wheat stocks to total use was low, real prices rose (*figure 1*). (Real prices have been adjusted for inflation.) In marketing year 1989/90, the world wheat stocks-to-use ratio is expected to be the lowest in 30 years. The projected ratio for total cereals is the smallest since 1974/75. As stocks in major exporting nations increase relative to world use, the downward trend in real cereal prices that slowed in the mid-1980's may resume.

None of the events underlying U.S. production shortfalls or food shortages abroad are enduring, except for economic stagnation in food-deficit countries. Poor economic policies coupled with a downturn in the global economy have taken their toll.

The national insolvency of some developing countries has its roots in OPEC's fourfold boost in petroleum prices during the mid-1970's. Petroleum-importing nations borrowed money from

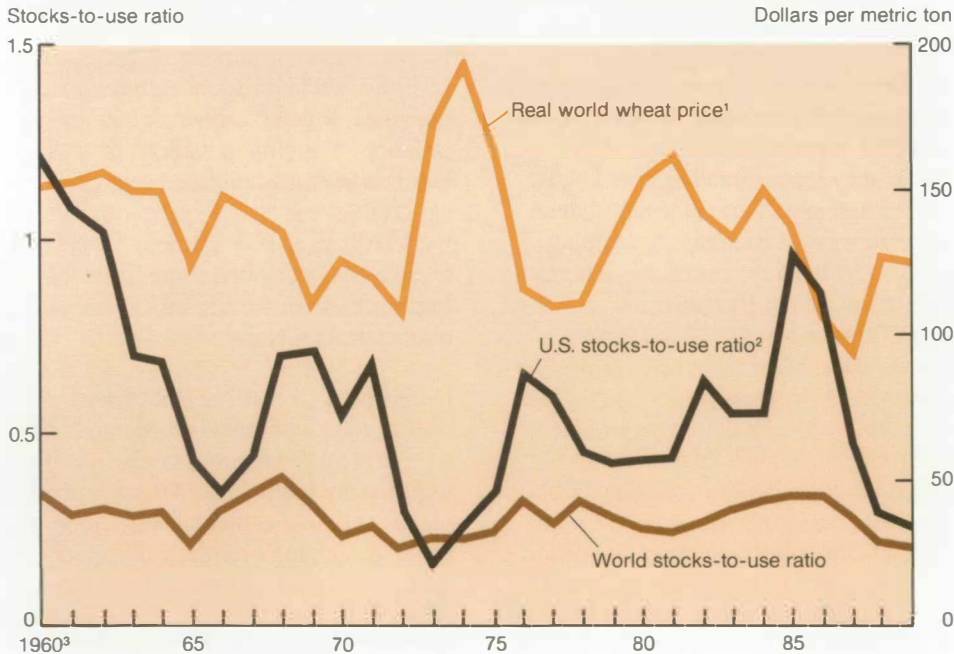
banks in developed countries to finance oil imports and did not maintain capital investment for industrialization. With the second major jump in oil prices in 1979-80, lending nations tightened their monetary policies to counter anticipated inflation. Developing nations faced larger loan repayments and stagnant export markets. The economic growth of the 1970's vanished. Although food-deficit countries exhibited some financial improvement in the late 1980's, they remain decidedly poor.

Indicators of Future Problems

The causes of today's inadequate world cereal production, stocks, and distribution are temporary. With the possible exception of economic stagnation in some developing countries, this inadequacy is unrelated to longer term factors. Most of the long-term threats are familiar. They include:

- A slowdown in technological change in agriculture.
- High population growth.
- Limited availability of agricultural resources.
- Environmental degradation and adverse climate change.
- The inability of policies and institutions to influence these other factors.

One of the most worrisome assertions made by those studying the world food situation is that agricultural technology is running out of steam. This comes from observing that yields of specially developed wheat and rice varieties are not increasing as fast as they once did. These high-yielding varieties were responsible for most of the growth in the world's food supply during the "Green Revolution" of the 1960's and 1970's. However, the news is not all bad. Yields of other crops have been increasing, and many countries, such as Bangladesh, have yet to achieve the full production potential of the improved rice and wheat varieties.

Figure 1. Stock Levels Are a Principal Determinant of World Wheat Prices

¹Hard red winter wheat, U.S. gulf ports, deflated by International Monetary Fund Commodity Price Index, 1989 estimated.

²Exports included in total use. ³Marketing years.

The plant breeding techniques that developed these high-yielding varieties may soon be supplemented with recombinant-DNA bioengineering methods. How soon these new procedures will be employed to improve cereal varieties is impossible to predict. They are most likely to have their initial impact on plant and animal disease control because microorganisms are easier to manipulate genetically.

Eventually, bioengineering will be able to significantly transform plants themselves. Once a plant's genetic code is known, it can be directly altered to change plant characteristics such as height, drought tolerance, and disease resistance. This will allow much more rapid progress in adapting a greater variety of plants to new environments.

The prospects for greater agricultural production are accompanied by the pros-

pect of having greater numbers of people to feed. Expectations for lower population growth that emerged in the 1980's have recently been dashed by the United Nations Population Fund, which projects world population growth in the 1990's of 921 million, compared with 843 million in the 1980's.

Population growth rates in food-deficit Sub-Saharan Africa are among the highest in the world, and population growth continues high in Egypt, long a major recipient of food aid. Neither India nor China, both of which sustain large annual population increases, has recently had to appeal for food aid. In a period of rapid social and political change, even small shifts in population growth rates in these countries would greatly change world population.

Population growth compounds the stress on natural resources, which leads

to environmental degradation and climate change. More land, including marginal grasslands and cleared forests, must be used to feed evergrowing populations. This puts stress on the environment, and when adverse conditions occur—like drought or flood—the land can lose its productive capacity altogether.

These large-scale changes can also alter climate. For example, the African Sahel lost much agricultural land when drought hit overgrazed areas. The disappearance of forests and grasslands alters temperatures and the wind patterns that govern precipitation. The recent desertification in the Sahel was preceded centuries earlier by overcutting and overgrazing in North Africa. While arid lands can be cultivated successfully, as in Jordan, Morocco, and Tunisia, production is highly irregular, adding to global food instability.

The loss of agricultural land is not confined to Africa. In the last couple of decades, overcutting of forests for fuel in Nepal has devastated agriculture. Topsoil that washed from the steep Himalayan hillsides into rivers and streams has permanently ruined the land's productivity.

The clearing of tropical forests in Brazil is harmful because of the atmospheric changes it induces. Also, Amazon forests harbor unique plant and animal life, the loss of which would reduce the genetic resources available to agricultural science.

Some experts, seeing the climatic changes and loss of genetic materials as irreversible, anticipate a bleak future for world agriculture. Others point out the negative impact that policies and institutions can have on agricultural production, but say this can change. For example, government mismanagement in the Soviet Union, China, and Eastern Europe curtailed agricultural output for decades, but recent policy changes bode well for their farming sectors.

Governments and public institutions will be influential in determining the adequacy of the world's food supply in coming years. Recent ERS analysis has indicated that none of the long-term threats—slower technological change, population growth, limited agricultural resources, or environmental degradation—are certain causes of a global food crisis in the next two or three decades, but avoidance of a crisis depends heavily on national institutions and public policy.

In many instances, environmental damage can be minimized by using agricultural production methods that are less abusive, but they are often more costly and may raise the cost of food. Many nations, including the United States, are faced with the choice of low food prices in the short term or long-term maintenance of their agricultural resource base. Public policy will also affect the development of bioengineering technology. Agriculture competes with other sectors for research funds. The level of funding for agriculture is influenced by public acceptance of the products made with modern bioengineering.

There is no doubt that major food exporting nations can increase output to serve expanding export markets. However, there is no reason to assume that current production advances in many African countries are driven by anything other than a fortunate turn in the weather. Food needs will climb as populations grow rapidly in Africa, Asia, and Latin America. Reducing indebtedness and

replenishing budget coffers require broad-based economic growth. Meanwhile, food aid from developed nations can free foreign exchange for imports of needed capital goods. In the past, some developing countries have used too much of their foreign exchange to fund current consumption instead of investing in factories and equipment.

Today's concern about a world food crisis could be replaced by an optimistic assessment with the return of favorable weather, rebuilding of cereal stocks, or less rapid population growth. The introduction of existing crop varieties and production practices to new areas of the world and development of new production technologies through bioengineering are also cause for hope. Now that major world institutions are concerned about the debt of poor countries, the financial front also looks brighter.

But in coming decades, as in the past, decisions could be made and policies implemented that would inhibit rather than promote agriculture. Thus, sounding the alarm from time to time may be beneficial. ■

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