

## WORLD FOOD DISTRIBUTION POLICIES\*

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Once again the spectre of Malthusian catastrophe has captured the headlines. The worldwide shortages of food in 1972 and 1973 and the attendant high food prices are the sixth time in the last century that there has been widespread concern about food shortages and famine.<sup>1/</sup> And, we are very likely to have similar periods of food shortages in the future.

Previous concerns about the world food situation focused primarily on the ability of production to keep pace with growing demand at both a national and a global level. In the present tight world food situation, a great deal of attention is also being paid to issues concerning (a) stabilization of food supplies through appropriate reserve policies, (b) stabilization of world market prices, and (c) improved world-wide distribution of food which ensures "adequate" supplies of food to rich and poor nations alike.

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<sup>1/</sup> See Martin E. Abel, "Food Production Possibilities in the High-Food-Drain Economies," American Journal of Agricultural Economics, Vol. 50, No. 5, December 1968, for a brief historical review.

This paper is concerned with strategies for dealing with annual variations about the long-term trends in food production or demand, whether on a global or a country basis. The long-run trends in world food production and consumption are not discussed. This has been done elsewhere.<sup>2/</sup> However, long-run and short-run considerations are not independent of each other. To the extent to which the long-term trends imply an increased degree of specialization in food productions among countries and a growing volume of international trade in food, stability of food supplies and prices in an individual country are increasingly influenced by developments in other countries. More about this point later.

Stabilization of food supplies and prices implies the existence of food reserves or reserve production capacity which can readily be brought into production. In this paper, both aspects of a food reserve are discussed in terms of grains. These are the commodities which form the basis of most of our food supplies, are most suitable for storage, and are large components of international agricultural trade.

#### Background

Before discussing what might be the ingredients of a world distribution policy, it would be useful to consider some of the important changes which have taken place on the world agricultural scene as they relate to the distribution of world food supplies. Let us focus on the period since World War II.

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<sup>2/</sup> See, for example, Anthony S. Rojko, Francis S. Urban and James J. Naive, World Demand Prospects for Grains in 1980 with Emphasis on Trade by the Less Developed Countries, FAER No. 75, ERS, USDA, December 1971, and FAO: Agricultural Commodities--Projections for 1975 and 1985, Vol. I and II, Food and Agricultural Organization of the United Nations, Rome, 1967.

One important change has been the humanitarian revolution which resulted in large groups of people feeling some obligation for the welfare of other peoples. As a minimum, large scale famine and starvation has become morally intolerable. Thus, we observe the fairly new phenomenon that people who face starvation because of acts of nature such as drought, earthquakes, raving pests, etc. and because of acts of man against man such as war have a rightful claim on the world's food supplies. The droughts in South Asia in 1965/66, 1966/67, and 1972/73; the persistent drought in Sub-Sahara Africa over the past few years, and the wars in Nigeria and Bangladesh create demands upon world food supplies and exert significant upward pressure on food prices. The days are gone when several million Bengalis could die of starvation, as in the famine of 1943, without causing a ripple in the large world food supply and price picture. Furthermore, this universal humanitarian revolution has succeeded, as it should, in divorcing food needs from effective purchasing power. In this respect, there is an element of worldwide food distribution which is relatively insensitive to food prices and national purchasing power as the mechanism for allocating food supplies.

A second and not fully appreciated change in the world food picture is the decisions of a large number of countries to rely on world markets for their food supplies beyond what can be explained merely by growth in income and population. These are decisions which move countries, sometimes suddenly, away from autarkic national agricultural policies towards greater reliance on international trade. Whether these moves are for rational economic reasons which recognize the benefits of trade, or for domestic and international political reasons, is not always clear. But

even though we may not be sure of the motives, the impact on the world food situation is clear and sometimes very pronounced. The entry in a big way of the Soviet Union into world grain markets in 1972 illustrates this point. Unlike early 1963 when the Soviet Union adjusted to a precipitous drop in domestic grain production by severe belt-tightening which involved liquidation of large numbers of livestock, the Soviet Union in 1972 decided to maintain domestic levels of food consumption through massive grain imports. This momentous decision may have been due to a basic decision to liberalize trade policies and allow some semblance of comparative advantage to work. But they may have also been motivated by the political consideration that food shortages helped to topple Nikita Khrushchev in the USSR and Wladyslaw Gomulka in Poland. Regardless of motive, the impact of the Soviets' action on the world food situation is clear. One can find numerous other, though less dramatic, instances where the decisions of countries to follow less autarchic agricultural and general economic policies has had a sudden impact on the demand for food in world markets.<sup>3/</sup>

Finally, the rapid growth of incomes in an increasing number of countries has resulted in a rapid expansion of (a) demand for agricultural products and (b) agricultural trade. The rapid rates of growth in incomes are in part due to a growing rationalization of trade and production policies and are not, therefore, a completely exogenous factor in explaining the growth in world agricultural trade. Even though growth in trade based

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<sup>3/</sup> For example, the decisions of both Taiwan and Korea to increase livestock production on the basis of a modern feed industry led to a rapid and historically discontinuous increase in feed grain imports.

on growth of income and population, particularly in the developed countries, is predictable with a reasonable degree of accuracy, the results can, nevertheless, be spectacular. For example, U.S. agricultural exports to Japan increased from about \$1.0 billion in fiscal year 1969 to an estimated \$3.0 billion in fiscal year 1974.<sup>4/</sup>

Each of these changes in the world food scene has resulted in a greater interdependence among nations with respect to food supplies and food prices. It has become increasingly difficult for countries to insulate their food positions from events in other countries.

Some major changes in the demand for and supply of food occur on a systematic basis and can be predicted with a considerable degree of certainty. The systematic changes are generally not overly disruptive of the world food situation. Among the main forces producing regular growth are income and population on the demand side and sustained productivity growth on the supply side. But many other large changes--those resulting from national calamities or sudden changes in economic policies--are unpredictable and can cause serious dislocation in the world picture. Thus, the benefits to be derived from expanded and hopefully more economically rational trade can be accompanied by greater uncertainty concerning supply demand and price of food in world markets.

Until just recently, variations in world food prices have been kept within reasonable limits. This has been due in large measure to the ability of the United States to expand agricultural production in the 1940's and to maintain in the 1950's and 1960's a large food reserve either in the form of grain stocks or idle production capacity. The

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<sup>4/</sup> Outlook for U.S. Agricultural Exports, Economic Research Service, U.S. Department of Agriculture, Washington, D. C., November 6, 1973.

ability to draw on these stocks and reserve production capacity enabled the United States to meet unpredictable food shortages such as those caused by the severe droughts in South Asia in 1965-66 and 1966-67.

It may no longer be possible for the United States to unilaterally maintain a reasonable degree of stability in world food supplies and prices, or at home for that matter. The growing size of world trade in grains and the increased instability in the world grain markets, to be discussed below, imply a large level of reserve grain stocks in the United States for stabilization purposes, larger in fact than would probably be consistent with domestic U.S. agricultural and fiscal policy objectives. A second reason why the United States should not be the sole source of grain reserves is the difficulty in moving grain to places of need due to (a) the normal transaction and transport time being as long as three months, (b) unforeseen breakdowns in the transportation system such as dock or shipping strikes which prevent the timely movement of grain, and (c) the inability of the U.S. to carry large reserves of particular grains, namely rice, which are important to some countries.

Data on cereal production since 1955 for several regions of the world are presented in figure 1. These data clearly show the magnitude of annual variations in cereal production for the different regions. Most striking is the large annual variations in the USSR. We are familiar with the impact which the poor 1972 grain crop in the USSR had on world grain markets. Yet the decline in cereal production between 1971 and 1972 of about 13 million tons was not all that large compared to the declines in grain production of over 30 million tons each between 1962 and 1963 and between 1964 and 1965. Entry of the USSR into world grain trade on a

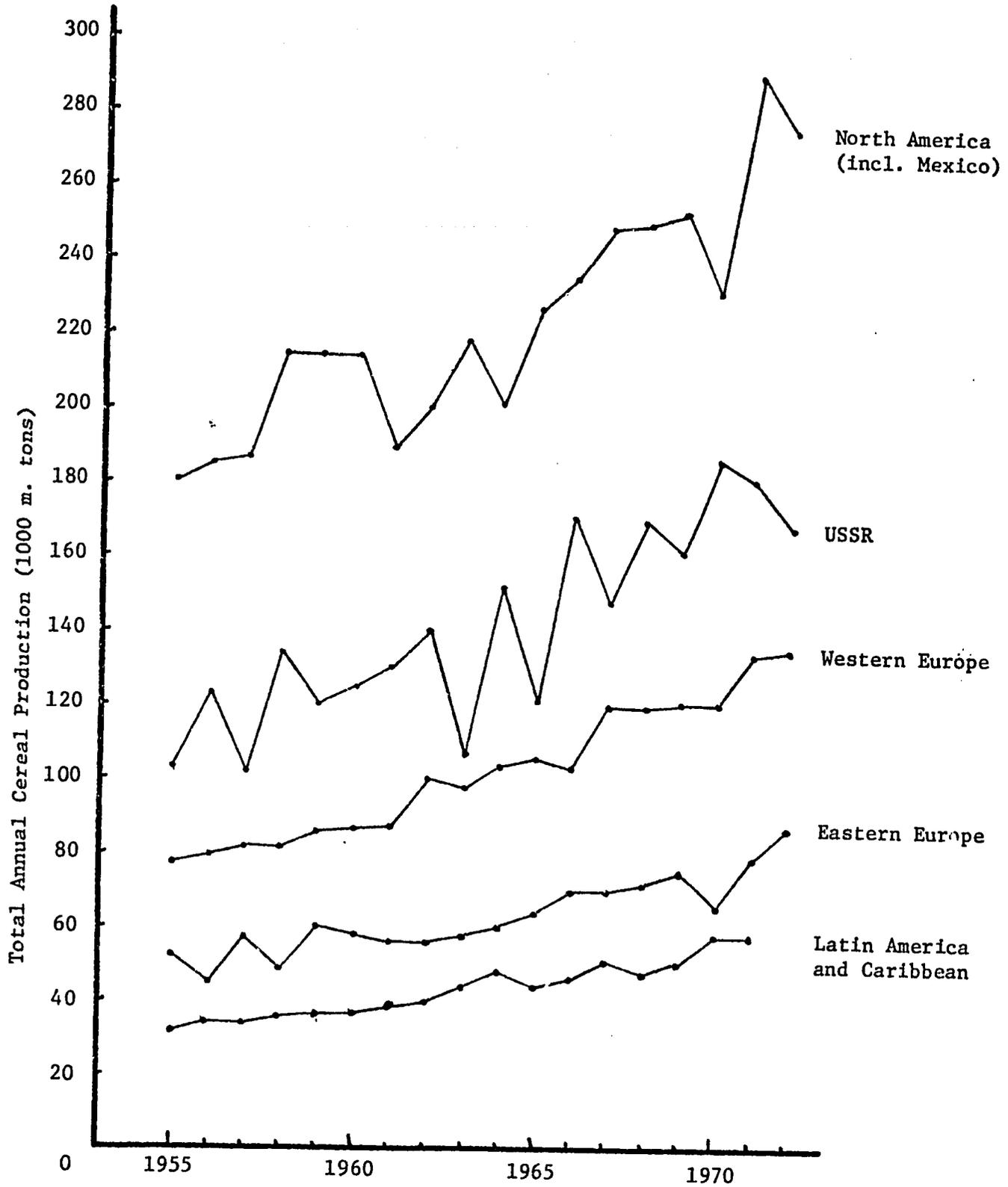


Figure 1. Cereal Production in Major Regions of the World, 1955 to 1972

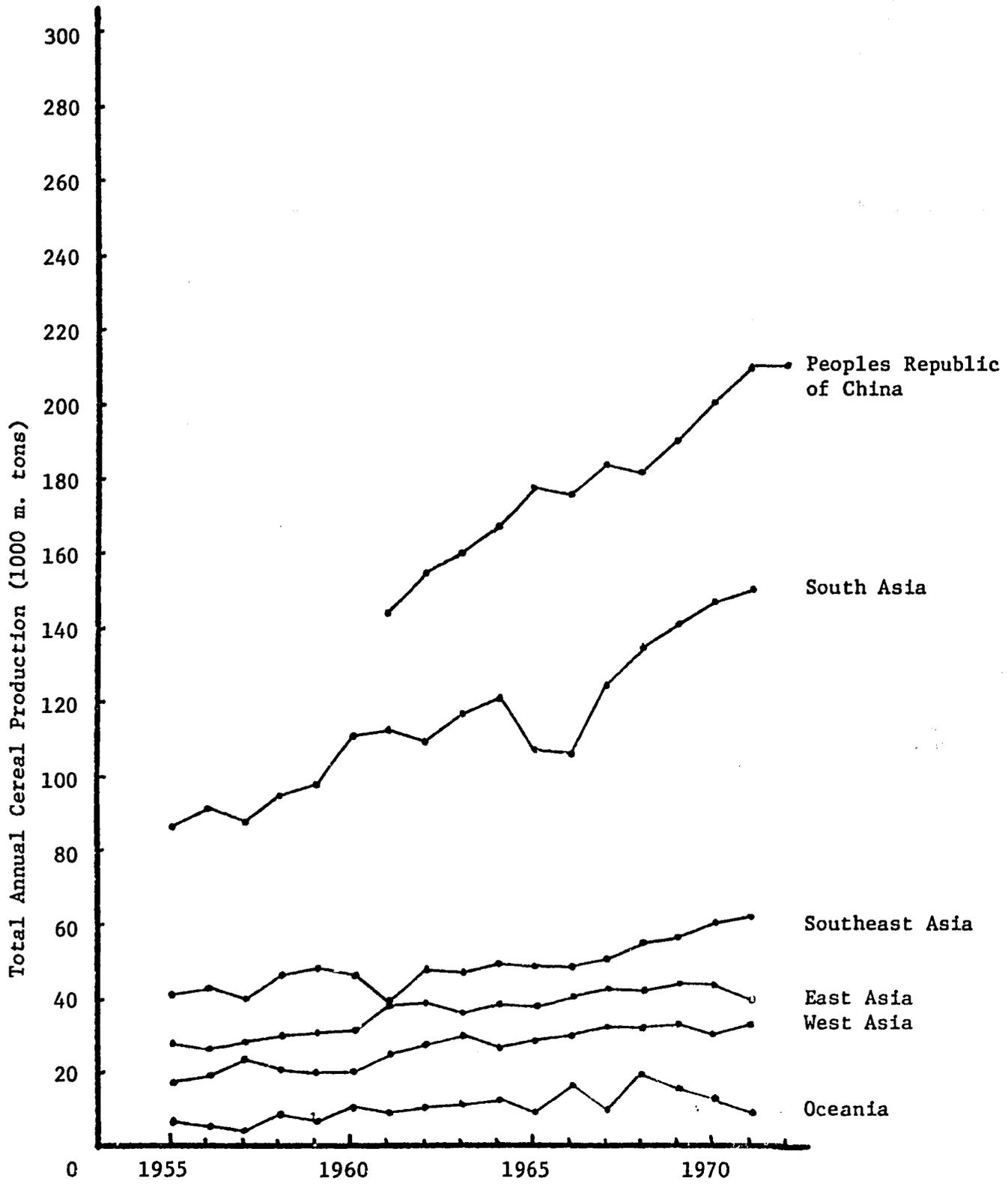


Figure 1. (continued)

regular basis must be viewed as a mixed blessing. On the positive side it enlarges the market of grain exporters. On the negative side it introduces a degree of instability into world markets which dwarfs the variations in cereal production one saw in South Asia in 1965 and 1966 or were seen in any other region of the world. A great deal of the annual fluctuations one observes in North America resulted from conscious production control efforts, with the exception of 1970 when there was a sharp decline in corn production in the United States due to the corn blight.

As long as the USSR was not a major factor in world grain trade, it was possible for the United States and a few other grain exporting countries to carry sufficient reserves to stabilize domestic and world grain markets. But with the USSR apparently in the world grain market on a long-term basis, together with uncertainties about what impact the Peoples Republic of China will have on world grain markets, it may no longer be feasible for grain exporters to carry sufficient reserves to maintain historical degrees of domestic and world price stability. This is a major new dimension of the international trade picture for agricultural products.

#### Strategy for the Future

There has recently been a plethora of discussion of the need for a world food reserve.<sup>5/</sup> There is widespread agreement that there must be

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<sup>5/</sup> Willard W. Cochrane, "Some Notes on the World Food Situation with Special Reference to the United States in 1973-74," presented before the Joint Economic Committee, U.S. Congress, July 30, 1973; Willard W. Cochrane, Feast or Famine: The Uncertain World of Food and Agriculture and Its Policy Implications for the United States, National Planning Association, Washington, D.C., forthcoming; Lester K. Brown, "The Need for a World Food Reserve," The Wall Street Journal, October 10, 1973; World Food Security: Proposal of the Director-General, Food and Agricultural Organization of

some sort of world food reserve. But there is not as yet a consensus as to the size and form which this reserve should take. The lack of agreement on this latter point is understandable when one considers that the need for and size of a food reserve for any one country depends very much upon what other countries do.

A workable world food reserve strategy could be evolved if countries collectively took the following steps.

First, each country should realistically assess (a) the likely trends in its levels of food consumption and production, (b) variations about these trends due to unpredictable events such as bad weather, (c) the amount of food price variability which it can "comfortably" accommodate, and (d) the size of grain and type (wheat, rice, or coarse grains) stocks required to keep food prices within this "comfortable" range of price variation. This would provide a measure of desired reserve stock levels for each country in terms of different types of grain.

Second, each country should determine what portion of its desired stock it can feasibly maintain within its own borders. Feasibility would be determined by financial considerations, storage capacity, and climatic

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the United Nations, Rome, Italy, August 1973; Robert C. Tetro, World Food Situation--Some FAO Perspectives, August 24, 1973; Don Paarlberg, "The New Era? Or Boom and Bust?", U.S. Department of Agriculture, November 6, 1973; Don Paarlberg, "World Food Situation and World Food System," statement before the Joint Subcommittee on Foreign Agricultural Policy and the Subcommittee on Agricultural Production, Marketing and Stabilization of Prices, Committee on Agriculture and Forestry, United States Senate, October 17, 1973; Earl L. Butz, "Food Security on a Global Basis," address before the Food and Agricultural Organization of the United Nations, Rome, Italy, November 13, 1973; Toward the Integration of World Agriculture: A Tripartite Report by Fourteen Experts from North America, The European Community, and Japan, The Brookings Institution, Washington, D. C., October 1973; and Timothy Josling, An International Grain Reserve Policy, British-North American Committee, July 19 3.

and other factors which affect the length of time that grain can be kept in storage without suffering significant storage losses. Each country would then commit itself to maintaining a feasible level of grain reserves. The relationship between feasible and desired levels of stocks would vary widely among countries. Certainly the rich, developed countries of the world should have little difficulty in maintaining stocks at desired levels. On the other hand, many poor countries would not be able to carry desired levels of reserve stocks because of financial or storage constraints.

Third, the developed countries of the world should agree to finance collectively a quantity of reserve stocks of grains for the developing countries approximately equal to the difference between desired and feasible levels. These reserve stocks would be treated as a food aid effort on the part of developed countries. Not all of these stocks should be held in the developed countries. A part of them, and possibly a large part, should be held in the developing countries where the unanticipated need for them will occur. However, it is important that the developing countries treat the grain they receive as reserve stocks and not let it be frittered away in current consumption. Food aid needs on a regular basis to meet current consumption requirements will have to be treated as a separate issue. Otherwise, it will be difficult to maintain a true reserve stock.<sup>6/</sup>

Fourth, it is important that at least all the major countries which are a significant factor in world grain trade be willing to participate in a timely information system involving reporting on crop production prospects, demand requirements and import needs. Unless countries are willing to make

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<sup>6/</sup>The use of P.L. 480 grain to help India build a buffer stock in the late 1960's is a good example of the kind of effort being suggested.

honest and timely assessments of their grain situations, it may be very difficult to maintain a reasonable degree of price stability in world grain markets.<sup>7/</sup>

Some have suggested that there be an international organization with authority to determine when grain reserves are to be reduced, when they are to be built up, and by what amounts. This strikes me as being an unworkable proposition for the simple reason that no major agricultural producing or consuming country will be willing to relinquish sovereignty over its own food supplies to an international body.

It should be clear that any strategy for maintaining grain reserves in a particular country depends very much on what other countries do. For example, the grain reserve levels in the United States required to achieve a given degree of price stability will be inversely related to the size of the grain reserves in major importing countries and in countries which experience wide annual fluctuations in grain production. It is, therefore, a valid question to ask what should be the grain reserve policies of the United States under alternative assumptions about what other countries do.<sup>8/</sup> This is an important issue if, as I have hypothesized, it is not feasible for the United States to play the sole or even a major role in stabilizing world grain prices.

Recent experience has shown that for a country such as the United States, the following four economic objectives are important. First, to

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<sup>7/</sup>The recent agreement of the USSR to provide the United States with forecasts of agricultural production is a step in the right direction.

<sup>8/</sup>The same issues face any country which is a significant exporter of grains.

maintain a reasonable degree of food price stability at home. It may be difficult to specify what is reasonable, but the wide fluctuations in food prices over the past year or so can certainly be deemed as unreasonable. Second, to promote the exports of agricultural products on an orderly basis. This involves assurance to our regular customers that the United States is a reliable source of food products. It also is important for orderly planning of future production in the United States by both farmers and the government. Third, to help meet the regular as well as unexpected grain import needs of the developing countries for both humanitarian and economic development reasons. And fourth, to contribute to overall stability in world grain markets. I would guess that under the turbulent market conditions of recent months, these four objectives appear in order of priority. Under more stable market conditions there might be some switching in the order, particularly as between the first and second objectives.

In a world in which all the major food producing and consuming countries were to cooperate in establishing a meaningful food reserve and a reasonable degree of price stability, as outlined earlier, it should be fairly easy for an individual country such as the United States to achieve all four economic objectives listed above. But what should be done by a country like the United States if one or more countries representing highly variable production and import requirements, such as, say, the USSR or India, does not cooperate? Should they be treated with the same degree of equity as other nations? This is an important question in those years when world food demands press heavily on supplies.

I would argue for the following approach by the United States, as a major food exporter. Primary emphasis should be placed on assuring the American consumer an adequate supply of food and fiber at fair and reasonable prices. Second, food supplies for our regular commercial export markets should be guaranteed. At the same time, these importing nations should be encouraged to maintain stocks of grains (and oilseeds) in sufficient quantity to cushion their food and feed needs against unpredictable shocks. Third, the United States should make a strong commitment to meeting the variable food needs of the developing countries. These nations should be guaranteed at least a minimum amount of food in times of tight world food situations. Again, the developing countries should be encouraged to maintain their own food reserves, with the United States and other developing countries providing a measure of assistance to develop and maintain these reserve stocks. Finally, those countries which make little or no effort to pursue meaningful grain reserve policies either on their own or in cooperation with other countries should receive lowest priority in the claims upon U.S. grain stocks. And, it should be made clear to such nations that when the world food situation is extremely tight they may not have any access to U.S. grain supplies.

This latter point has special significance for the Soviet Union. Until last year, world grain markets were largely insulated from the large variations in the USSR's grain production. That now appears to have changed as a result of basic changes in the USSR's food and agricultural policies. Unless the Soviet Union takes some major steps to increase its own grain reserves and thus even out variations in its domestic food supplies, it will raise havoc on world grain markets and the United States

should probably not treat grain sales to the USSR with any significant degree of priority. The cost in terms of world market instability may be much greater than the economic and political gains derived from doing business with the USSR.

Whether the United States follows a unilateral reserve policy or one geared to a larger international effort, one thing is clear: namely, it is important for the United States to carry significant reserves of grain (and oilseeds).<sup>9/</sup> The United States has promoted agricultural exports and oriented its policies for major commodities toward competition in world markets. Success in these two efforts has increasingly subjected the U.S. market to changes in food supply and demand conditions in other parts of the world. Thus, if the U.S. is to have reasonable stability in grain prices, it must carry sufficiently large grain reserves to offset variations in supply and demand at home and abroad. The fact that the U.S. may not be able to unilaterally stabilize world grain prices does not imply that it should not carry appreciable grain reserves. Even the more limited objective of assuring stable grain supplies at home and to our regular commercial and food aid markets abroad requires sizeable stocks of grain.

A significant portion of these stocks must be held by the U.S. government. It is not enough, as some have suggested,<sup>10/</sup> to rely primarily on private stocks. These stocks must, almost of necessity, gear their operations to predictable developments; e.g., stocks consistent with intra-year

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<sup>9/</sup> For an excellent discussion of this point see Willard W. Cochrane, Feast or Famine: The Uncertain World of Food and Agriculture and Its Policy Implications for the United States, The National Planning Association, Washington, D. C., forthcoming.

<sup>10/</sup> Earl L. Butz, "Food Security on a Global Basis," address before the Food and Agricultural Organization of the United Nations, Rome, Italy, November 13, 1973.

marketings and long-term growth trends. The level of private stocks will be determined by commercial profitability criteria. And levels of private stocks will be sensitive to the degree of certainty with respect to market developments. Within a given marketing year farmers and traders in the United States can reduce price risk associated with stocks by having others share this risk through a combination of government programs and use of futures markets. From the longer-term point of view, the regular, systematic growth in domestic and foreign demands also provides a basis for determining "optimum" levels of private stocks. But what we are concerned with is the unpredictable; i.e., the large and unpredictable perturbations about these longer-term trends. Farmers and private trade interests will not nor should not deal with these latter types of variations in the world food situation. These are matters of national concern and, accordingly, should be part of national policies and actions.

Furthermore, food price stability is too important an issue to be left to farmers and ministers of agriculture. Wildly fluctuating food prices raise havoc with entire economies, not just the farm sector, in both rich and poor countries. Volatile food prices affect the general level of prices; contribute to inflation to the extent that high food prices contribute to general price increases but the reverse does not hold because of institutional rigidities (it is hard to negotiate wages downward); contribute to instability in balance of payments positions of countries; and contribute to social unrest and discord.

#### Toward a Research Agenda

This paper has dealt with the issue of what to do about wide fluctuations in world food supplies and prices in a highly qualitative manner,

as have most other writings on the subject. But if governments and international institutions are serious about programs for stabilizing annual fluctuations in the world food situation, these programs should rest on a sound analytical base. This we do not have.

One can visualize three major lines of research which would provide a more analytical and objective basis for formulation and operation of grain reserve policies and programs.

One line of analyses should deal with the development of quantitative models which link the demand, supply and price relationships of individual countries through world markets. This type of analysis should be capable of analyzing the impact on world prices of major changes in agricultural policies and programs. One example of this type of work is the study of the U.S. and world soybean markets by Houck, Ryan and Subotnik.<sup>11/</sup> A similar effort for feed grains is under way at the University of Minnesota in collaboration with the Economic Research Service of the U.S. Department of Agriculture.<sup>12/</sup>

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<sup>11/</sup> James P. Houck, Mary E. Ryan and Abraham Subotnik, Soybeans and Their Products: Markets, Models, and Policy (Minneapolis: University of Minnesota Press, 1972).

<sup>12/</sup> To date, work has been completed on estimation of food grain acreage in the United States. See, J. P. Houck and M. E. Ryan, "Supply Analysis for Corn in the United States: The Impact on Changing Government Programs," American Journal of Agricultural Economics, Vol. 54, No. 2, May 1972; Mary E. Ryan and Martin E. Abel, "Corn Acreage Response and the Set-Aside Program," Agricultural Economics Research, Vol. 24, No. 4, October 1972; Mary E. Ryan and Martin E. Abel, "Supply Response of U.S. Sorghum Acreage to Government Programs," Agricultural Economics Research, Vol. 25, No. 2, April 1973; and Mary E. Ryan and Martin E. Abel, "Oats and Barley Acreage Response to Government Programs," Agricultural Economics Research, Vol. 25, No. 4, October 1973. Research is currently under way on the U.S. domestic demand and the foreign demand and supply of feed grains.

Another line of research should deal with the causes and nature of annual fluctuations in food production for at least the major countries. We need to know much more about the probability distributions which characterize fluctuations in production. The work by Waugh<sup>13/</sup> and others<sup>14/</sup> suggests some promising directions for research in this area.

Finally, we need to know much more about the implications of measures to stabilize prices for stability of producers' incomes, export earnings, general price level, etc. The implications will vary among commodities and countries, depending on the magnitude and sources of price instability, as well as on the particular stabilization scheme being considered. While the theoretical literature is extensive, there are few empirical studies.<sup>15/</sup>

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<sup>13/</sup> Frederick V. Waugh, "Reserve Stocks of Farm Products," Agricultural Policy: A Review of Programs and Needs, Technical Papers, Vol. V, National Advisory Commission on Food and Fiber, August 1967.

<sup>14/</sup> See, for example, S. Nand and J. P. Houck, Buffer Stocks of Food Grains in India, Economic Study Report S71-2, Department of Agricultural and Applied Economics, University of Minnesota, May 1971.

<sup>15/</sup> Examples of such work are: J. P. Houck, An Economic Analysis of Maize Prices in Thailand: The Effect of Recent Export Agreements, Staff Paper No. 7, Department of Agricultural Economics, Kasetsart University, Bangkok, Thailand, August 1972; J. P. Houck, Some Aspects of Income Stabilization for Primary Producers, paper prepared for National Agricultural Outlook Conference, February 1972, Canberra, Australia (to be published by Australian Journal of Agricultural Economics); D. I. Bateman, "Buffer Stocks and Producers' Incomes," Journal of Agricultural Economics, Vol. 16, No. 4, December 1965; K. O. Campbell, "The Challenge of Production Instability in Australian Agriculture," Australian Journal of Agricultural Economics, Vol. 2, No. 1, July 1958; K. O. Campbell, "National Commodity Stabilization Schemes: Some Reflections Based on Australian Experience," International Explorations of Agricultural Economics (Ames: Iowa State University Press, 1964); J. H. Duloy, "More on Buffer Stocks and Producer Income," Journal of Agricultural Economics, Vol. 17, No. 2, September 1966; H. G. Grubel, "Foreign Exchange Earnings and Price Stabilization Schemes," American Economic Review, Vol. 54, No. 4, June 1964; J. W. Longworth, "The Stabilization and Distribution Effects of the Australian Wheat Economy," Australian Journal of Agricultural Economics, Vol. 11, No. 1, June 1967;

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