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PREPARING FOR THE CONTINGENCY OF INTENSE PRESSURE ON FOOD-PRODUCING RESOURCES

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Concern for providing food as basic sustenance is a common denominator in human affairs. The level of confidence in ability to provide well varies from time to time and place to place. But some degree of apprehension is instinctive in the human psyche. It never disappears.

In opening years of the 1980s apprehension about adequate food grips even so abundantly endowed a country as the United States. Still remembered are the erratic crop harvests of the 1970s. In 1980 dry weather diminished yields of fall-harvested crops. And during the winter of 1980-81 rain- and snowfall was below average from coast to coast, inviting fears of repeating the drouths of the 1930s.

Insecurity has more and deeper roots than variable weather. Most notable are the steadily growing demands upon the U. S. food supply, highlighted by an escalating volume of exports in recent years, and restraints to productive capacity framed by limits to land and a tightening of the petroleum economy to which agricultural technology is now so closely tied.

Agricultural Exports. The value of U. S. agricultural exports increased five-fold during the last decade. Larger exports are a welcome source of dollar exchange, even as they underpin grain farmers' income. But so great an expansion, virtually an internationalization of U. S. agriculture, creates its own problems. Our buyers begin to depend on the availability of supplies from the United States. And U. S. exporters, reciprocally, count on continued large export markets and build their anticipation into higher capital values in agriculture. All this in spite of the notorious instability in both foreign demand and the size of U. S. harvests.

The new reciprocal dependency amounts to a change in outlook, in philosophy, about our international trade in farm products. In the past, markets for those products were domestically oriented. Domestic consumers were seen as the primary market and exports were essentially a residual. Likewise, most of our buyers depended mainly on their own production and drew on the United States (and other exporters) as their residual supplier. As that ad hoc accommodation gives way to dependency in both directions, deep consequences follow. More than is willingly admitted, internationalization leads to a degree of politicalization of trade. So it is that exportation of farm products has been embargoed in several instances in recent years -- though, significantly, for different reasons each time. So it is too that three bilateral trade agreements have been entered into during the last five years. Multilateral versus bilateral trade policy has become an issue of contentious debate.

Statement prepared for Agriculture Committee, National Planning Association, April 1981.

Equally relevant, however, and perhaps ominous, is the implied message of a potential confrontation between export buyers and domestic consumers during any severe shortage in U. S. farm output in the future. This will be exacerbated if, and to the extent, conversion of grains into motor fuel adds to the conventional domestic demand for farm products for food and fiber.

The Energy Equation. In the long history of mankind the capacity to produce and deliver food has been associated with the availability of farmland, measured in both area and quality. Only in our era have other resources employed in agriculture added materially to productive capacity. Those nonfarm resources are primarily minerals, but overshadowing all is fossil fuel energy. Widely known is how much of the grand gains in agricultural productivity in developed nations is attributable to abundant and inexpensive energy. Also now familiar is the certain prospect that fossil fuel energy will be more costly in the future than the past. It might be physically scarce or even unavailable at some times and places.

Fossil fuel energy has provided the feedstock for nitrogen fertilizer, is the base for many chemicals used in farming, and has allowed draft animals to be replaced by tractors and other power equipment. In the United States horses and mules once ate the feed produced on 60 million cropland acres.

Fossil fuels have also replaced human labor and spared human drudgery. In the process workers have been made available to urban industry. Whether labor-saving practices in farming enhance gross farm output is a different matter and more questionable.

In sum, more costly fossil fuel energy will henceforth restrain agricultural productivity to some degree, notably in agricultural regions that have depended on it so heavily. Paradoxically, regions of less modernized farming practices are less vulnerable. Admittedly, in advanced nations such as the United States the magnitude of the effect of costly fuel will depend in part on national policy. But the nature and implication of the overall situation are not in question. The harsh fact of the matter is that cheap energy as a source of high agricultural productivity has faded into history. As Vernon Ruttan of the University of Minnesota puts it, "We've come to the end of the liquid fuel frontier."[1]

The relation of energy to agriculture has lately taken on an added dimension. It is the diversion of grain, principally corn, from usual channels into distillation for ethanol as supplement to gasoline for motor fuel. As of 1981 the quantities involved were not yet significant. But if ethanol from grain were to become a major alternative fuel, the feed grain economy of the United States would go through shock.

Energy in agriculture thus is a pincers. One jaw is worsening access to fossil fuel energy. The other is a nascent but already growing demand to convert farm products into industrial energy, as replacement of fossil fuels. The pincers can bite hard.

Precautionary Admission of Uncertainty

In view of the emerging strains on the agricultural economy of the United States it is timely to assess the situation and sketch possible directions for making policy. The best available data will be set forth below.

Nonetheless, forecasting is fallible. A caveat is necessary. Nothing about trends in agriculture is positive, certain. The more likely prospect is for relative

scarcity, at least in some years. But this is not a certainty. Export demand might not retain its recent surge. The world needs our food, but needs are never entirely fulfilled. Whether and to what extent needs in buying nations will be converted to demand will depend less on resources or technology than on human institutions including the international monetary mechanism and the wealth versus poverty balance within each country. There are uncertainties too in estimating the productive capacity of agriculture, here and in other places. Startling breakthroughs in technology always are possible.

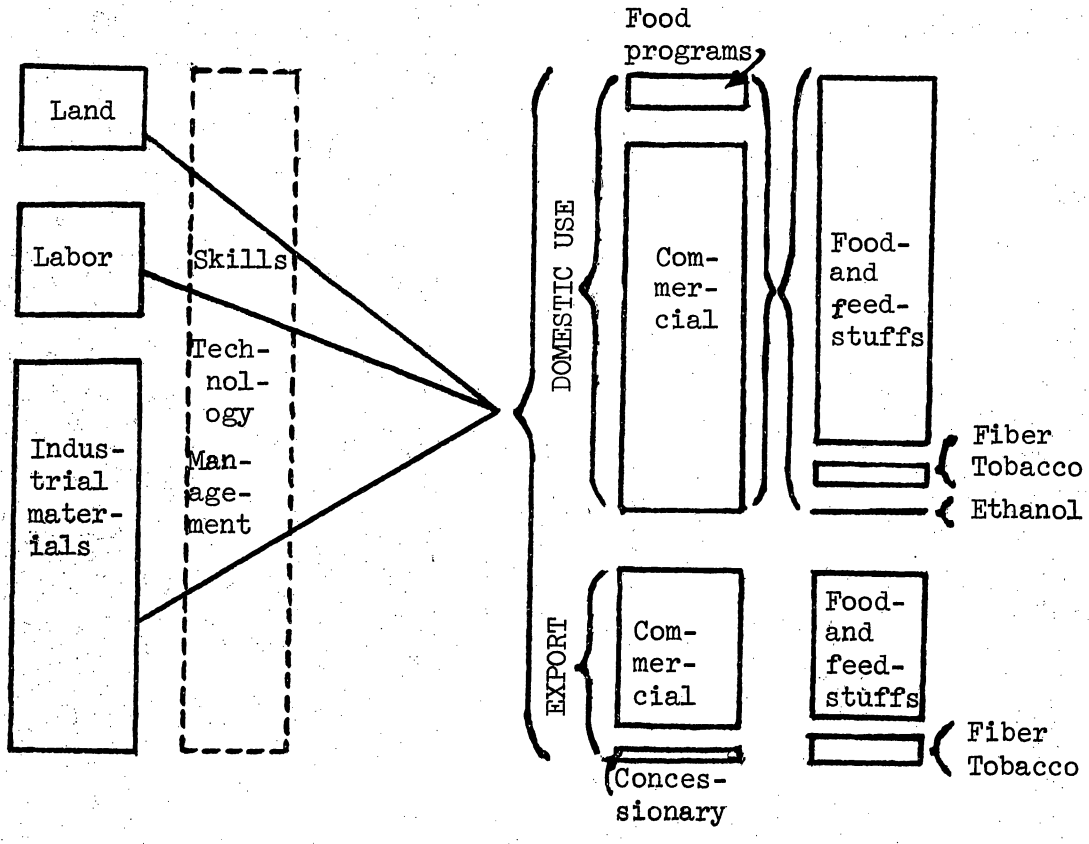
Yet the weight of evidence is that farm products will be relatively scarcer in future years than in the past. The probability is high enough that preparations for that contingency ought to be made in national policy. To repeat, preparation for the contingency is in order, a stance different from planning for certainty.

Diagrammatic Flow of U. S. Farm Products

Farm products originate through combination of several resources. They move into a variety of destinations. The basic pattern is shown in the diagram below.

Bars in the diagram are illustrative and indicate relative magnitude. They are not statistically precise for any given year.

PRODUCTION AND DISTRIBUTION OF FARM PRODUCTS



Basic resources are land, labor, and materials of non-farm origin. Land and farm labor together comprise about a third of all resources used in farm production. The other two-thirds are materials and services that come from off the farm.

Skills and technology are graphed not as an additional input but as joining with management to give direction to employment of the three basic resources. Thereby products are turned out that go their several directions.

Of the indudtrial materials used in agriculture many are mineral. They are not only the fossil fuels but various metals. They have in common that all are becoming scarcer and more expensive. Because they have become so big a part of all resources entering agricultural production, their scarcity is a significant obstacle to maintaining the momentum of steadily increasing agricultural output.

In fact, the big place of nonfarm resources in today's agriculture may be the most significant or even most foreboding message of the diagram. Growing tightness in access to many of those resources has major bearing on current and future farm productivity.

Also relevant is that although virtually all the land and labor resources are domestic many of the industrial materials are imported. Only a trace of our farmland is held by foreign owners, and non-resident migratory laborers provide a relatively minor part of all labor in agriculture. But many of the industrial materials used in agriculture are now imported. Today's agriculture is international not only on the market-outlet side but in its productive resources too.

Farm Product Exports

In recent years approximately 25-30 percent of all U. S. farm products have been exported. The export percentage is higher for grains, soybeans, and cotton, but lower for most other farm products.

The largest part of the 65-70 percent of farm output that is used domestically is consumed as food. Of this about 5 percent moves through concessionary food programs, illustrated by a small block on the chart. Principal programs are Food Stamps, child nutrition, and WIC.[2]

Grain for ethanol is shown as a thin line on the chart, as a reminder that the outlet exists. In 1980, 80-100 million bushels of corn were used for the purpose. How large the outlet may become in the future is an issue to be addressed below.

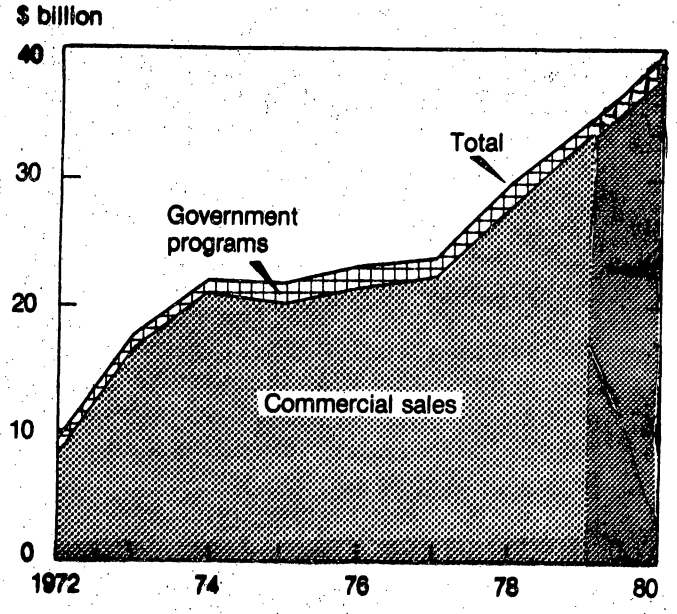
Exports of farm products reached a value of $40 billion in 1979-80 (see chart). The five-fold expansion in 10 years divides almost equally between higher unit prices and larger volume. The annual tonnage of exports more than doubled during the period.

To be noted in the left-hand chart is the relatively constant and minor role of exports under government programs. Concessionary exports, either for soft loans or as direct grants, amount to about five percent of the export total.

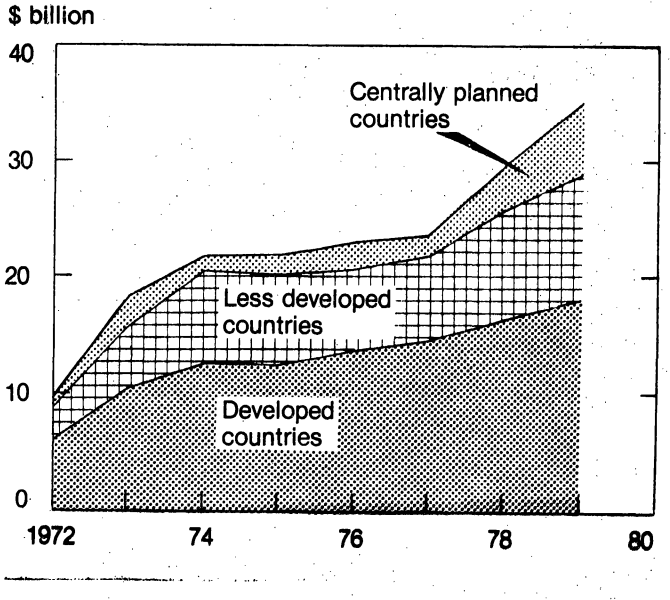
The value of exports has increased to each major area. The right-hand chart reminds that not only the wealthier countries of the world but poorer ones too buy

our farm products. The stratum for "less developed countries" includes various OPEC buyers, who are far from poor; but most countries are those of Southeast Asia, Africa, and Latin America, beset by low incomes, that rely on the United States for food grains -- wheat and rice.

Government Programs and Commercial Sales of U.S. Agricultural Exports



U.S. Agricultural Exports to Major Areas



Nevertheless, the fastest rate of increase is in exports to centrally planned countries. These are the countries of Eastern Europe, the Soviet Union, and Peoples Republic of China.

Factors Underlying Rising Exports. Abner Womack and Maury Bredahl of the University of Missouri list not fewer than seven major influences on expanding U. S. farm exports. At least three of these may be classed as political -- they involve policy decisions in buying countries, or here at home. The economists cite, in this regard, "decisions in centrally planned economies to increase meat supplies to consumers, . . . /a new/ U. S. policy that encouraged exports to centrally planned economies beginning in the early seventies . . . and the current U. S. farm program based on a managed buffer stock policy."

Also political, in a sense, was the U. S. action in the early 1970s to devalue the dollar and replace fixed exchange with a managed float. This affected trade with all countries whose currencies remained relatively strong.

More strictly economic was the increased demand for meat products in a number of developed countries. This laid the groundwork for much of the growth in U. S. exports of feed grains and soybeans.[3]

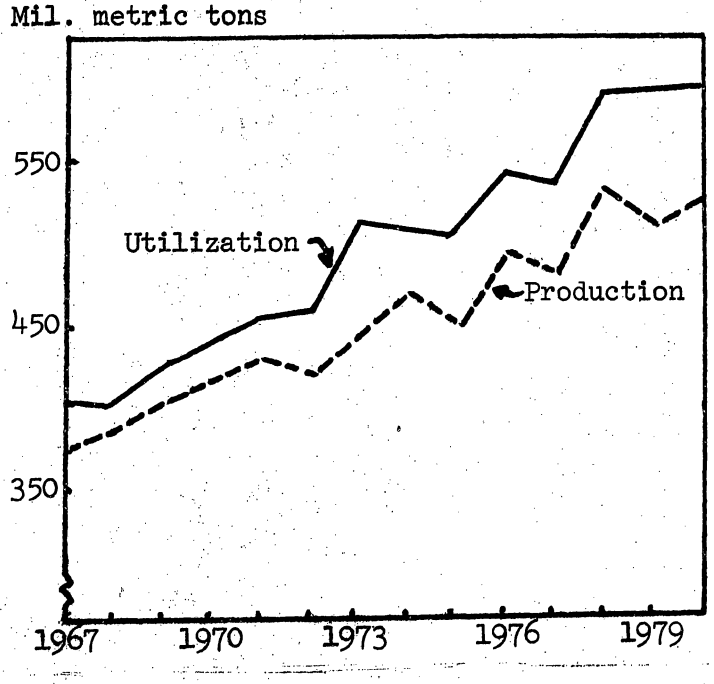
Perhaps most fundamental of all was a steady growth in pressure of world population on world agricultural production capacity. Although no global assessments will be offered here, the net consequence was a substantial and widening consumption-production shortfall for the grains and soybeans in much of the world.

Trends for Grains and Soybeans. All farm products joined in the uptrend in U. S. export values during the 1970s. But the food and feed grains and soybeans were in the lead and they now account for two-thirds the value of all farm products exported. These products will be at the center of future export policy.

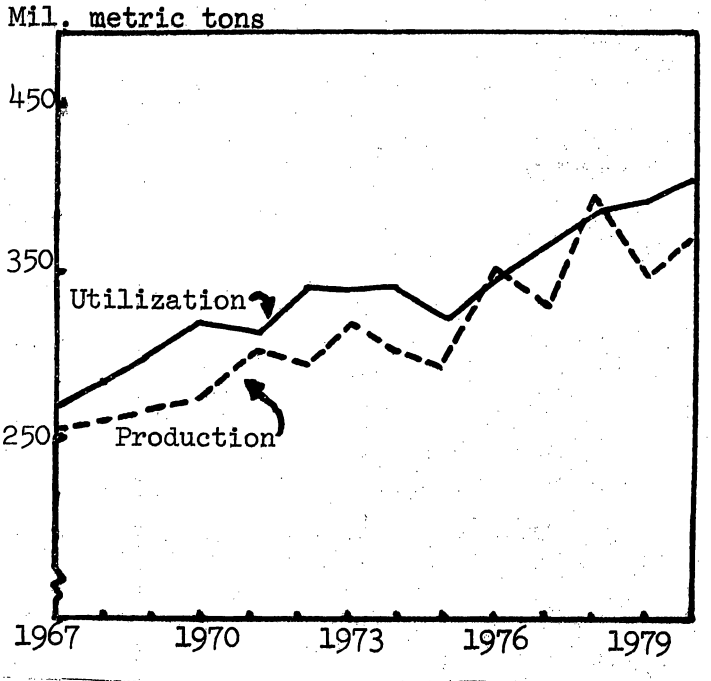
Expressed in summary terms, in the last two decades and especially during the 1970s the world as a whole outside the United States experienced a growing deficit between consumption and its production for the important crops of feed grains, wheat, and soybeans. The United States was able to fill that deficit. It did so without difficulty during the 1960s. In the 1970s export expansion did not come so easily. When further gains in per-acre yields were modest the larger exports were made possible by adding to cropped acreage and by denying our own consumers (via the pricing mechanism) any substantial improvement in their diets. Both factors will be touched on below.

The charts that follow present world production-consumption trends since 1967 for feed grains and wheat. For feed grains the shortfall in production outside the United States increased more than 2 million metric tons, or 90 million bushels, annually. For wheat the gap widened less rapidly. The annual deficit grew just under 1 million tons, or 35 million bushels, each year. So it is that corn exports from the United States are now about $2\frac{1}{2}$ billion bushels annually, or 40 percent of production. Other feed grains do not move so freely into export trade, and a little less than 30 percent of all feed grains combined are shipped abroad.

PRODUCTION AND UTILIZATION OF FEED GRAINS, WORLD OUTSIDE U. S.



PRODUCTION AND UTILIZATION OF WHEAT, WORLD OUTSIDE U. S.



Annual U. S. wheat exports now run around 1-1/3 billion bushels, or 60 percent of production.

World demand for U. S. soybeans has increased about as fast as that for feed grains (although quantities are smaller). Soybean exports (including meal) are now the equivalent of more than 1 billion bushels, which are half or more of production.

Abner Womack and Maury Bredahl, from whom these data also are taken, estimate that recent rates of growth in exports of feed grains, wheat, and soybeans require three million more acres of cropland each year, if yields do not increase materially.

Warning of Uncertainty. Before considering both the potential for further gains in U. S. agricultural production, and knotty problems of competitive claimants for whatever can be produced, it is timely to call attention once more to the hazards in merely projecting past trends as a guide to prospects for the future.

Only when forces previously at work continue operative can trends be extrapolated with confidence. Some of the factors influential in the last decade or two are likely to continue so in years ahead. Others may not.

Some projections of export demand are little more than conjectures. Presumably, planned economies will not only prefer to sustain the dietary improvements of recent years but will be under internal pressure to do so. Germany and Japan will want to continue their higher rates of meat consumption. But any confidence that these preferences will prevail is predicated on continued economic and political stability in those countries. It is worth remembering that the populations of Eastern and Western Europe and Japan do not require high content of animal foods. Those peoples subsisted on grains and potatoes throughout many centuries and could do so again. Most higher income countries are free of the imperative of threatened starvation or even serious malnutrition.

Not so with regard to the other bloc of markets for U. S. foodstuffs, the poorer countries of Asia, Africa, and Latin America. Although not big in takings of feed grains, they buy half or more of the wheat and rice we export. They need those grains desperately, even for survival. At the same time they are pinched for foreign exchange. Most now pay for their purchases from us; they get only a modest quantity of grain under concessionary terms. But to considerable extent those countries have paid with borrowed money. They borrow from international lending agencies and from banks in the United States and many countries.

At the end of 1980 the international indebtedness of low income countries was on the order of $350-400 billion. More than half was owed to commercial banks, many of them in the United States. Often, debts are serviced not by repayment but by further borrowing. The situation originates in large measure in rising prices of petroleum, and shows no sign of ameliorating soon. It is a clear negative factor in estimates of future exports of U. S. farm products.

On the other hand, a factor pointing toward a sustained uptrend in U. S. exports is the lagging agricultural productivity in much of the world. A number of countries have been unable to continue their earlier rate of increase in output of their farms. Again, the rising cost of petroleum is one of the causes, and it is especially restraining in countries that enjoyed the benefits of the Green Revolution only to find that the necessary fuel and fertilizer suddenly became expensive.

Considered together, the several factors that explain booming U. S. exports of farm products in the 1970s seem likely to underpin further expansion, but not

necessarily at unchecked rate. The probability of at least gradual growth is high enough to justify preparing for the contingency of at least some periods of relative tightness in supply of U. S. farm products.

The Domestic Food Economy

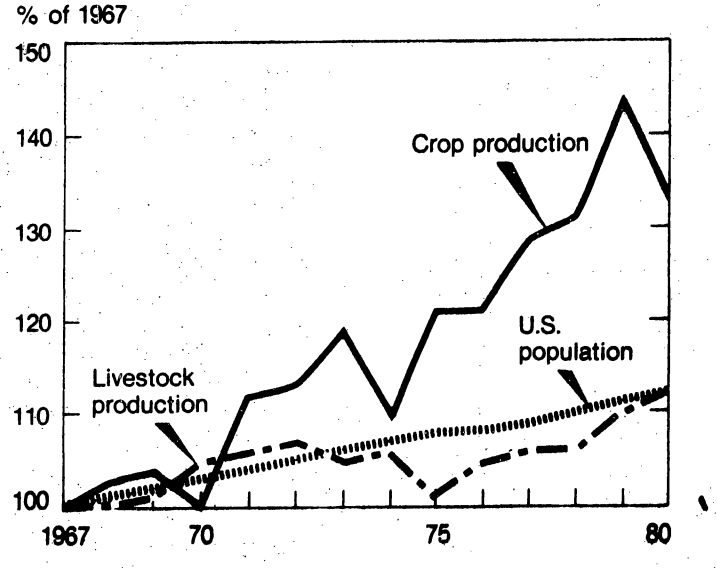
Agricultural output in the United States has trended upward in the last decade, although somewhat erratically. A sizable part of the increase came from adding to the acreage under cultivation. Yields per acre improved only rather slowly.

Additional acreages were cropped as national programs to idle ("set-aside") land were rarely activated, and as higher prices drew grassland into cultivation.

At the same time the pattern of utilization of production was modified. In contrast with earlier periods, the increased output did not go mainly into domestic use. Instead, most was exported. The composition of diets of U. S. consumers has showed the effect. In spite of growing subsidization of food consumption, primarily via Food Stamps and National School Lunch, the quality of average diets as traditionally measured -- that is, by the content of foods of animal origin -- has remained essentially unchanged. It has not improved.

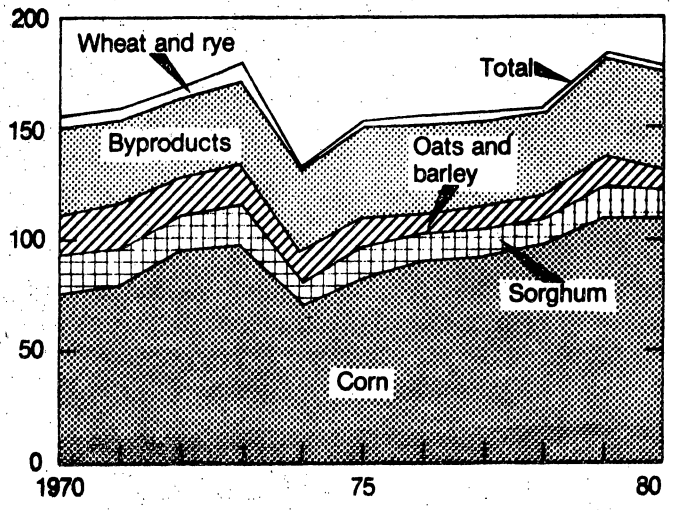
Charts that follow summarize the developments of the 1970s. In spite of setbacks in 1970 and 1974 crop production increased to a peak in 1979, then dropped off in the bad-weather year of 1980 (solid line in first chart).

Crop and Livestock Production



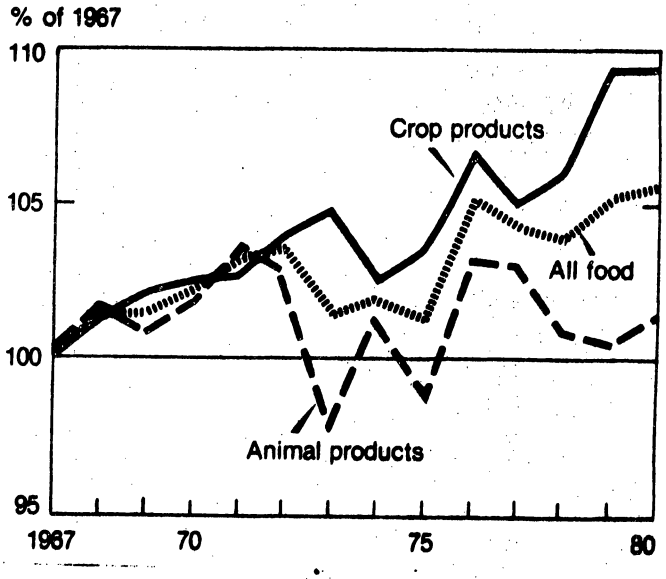
Even though the feed crops joined fully in the uptrend in output during the 1970s, the effect of expanded exports on U. S. feeding of livestock and poultry is illustrated impressively in the left-hand chart below. The quantity of feed concentrates fed moved upward only slowly, and byproducts fed accounted for some of the net increase. Most of the added output of feed crops went into export, not domestic feeding.

Feed Concentrates Fed



Feed fed to livestock and poultry.

Per Capita Consumption of Food



The effect of the limited expansion in feeding of feed crops is seen both in the nearly flat trend line for livestock production in the chart on page 8, and in t he record of per capita consumption of food, right-hand chart above. Consumption rates for animal products (meat, milk, eggs) were almost stable. Net gains in consumption were almost confined to foods classed as crop products. Part of the increase for crop products is accounted for by more fats and oils consumed.

Consumer demand has weakened for foods such as eggs and milk fat. On the other hand, a downward drift in consumption of red meats per person in recent years is explained more by competitive export demand for feedstuffs than by a loss of consumer preference for the foods.

Grain for Fuel

At the onset of the 1980s enthusiasm ran high for converting corn and other farm products into ethanol as an extender of gasoline for motor fuel. This is one facet of the broader concept of biomass as a resource of industrial energy.

A few commercial firms now successfully distill ethanol from corn and mix it in a 1:9 ratio with gasoline for sale as gasohol. To date the process has not proved economic. Even when subsidized gasohol has been more expensive than gasoline.

Production of ethanol by farmers on their farms was publicized widely in 1979-80 but failed to prove practical.

The U. S. government and particularly the Department of Agriculture was initially cool toward grain-for-ethanol but reversed its stand and in 1980 called for a target of producing 10 billion gallons of ethanol by 1990. Farmers' resentment of the Russian grain embargo of January 1980 and the weaker grain markets early in that year may have led to the announced support of an ethanol program. The Reagan Administration has since been cooler toward ethanol.

In brief, serious questions must be raised about the basic economy of an ethanol program but most trenchant is the likelihood that truly high reliance on ethanol from grain as a source of motor fuel would throw the food economy of the United States into traumatic adjustment. It would similarly induce shocks in nations that rely on us for an appreciable part of their food supply.

The topic will be addressed here in the context that a sizable program of converting corn to ethanol would constitute not a diversion of minor or surplus quantities of grain but a major reallocation of agricultural resources from producing food (and fiber and tobacco) to supplying motor fuels. Use of waste or off-quality materials, however, is not at issue.

Production of ethanol from corn using present technology is of questionable energy efficiency. Large amounts of energy are required to produce and harvest the corn crop and to ferment and distill the ethanol. Particularly energy-using is the distillation process in which ethanol is separated from water. Energy is required also to convert the ethanol so obtained to 200-proof, and to dry the wet stillage into a marketable byproduct feed.

There is no point whatever to distilling ethanol when petroleum is used as the fuel. Distillation with coal as fuel is more defensible, for although there may be little or no net gain in energy content, coal is a solid fuel that is hard to transport. Liquid ethanol is a preferred fuel.

Financial subsidy to production of ethanol for gasohol begins with exempting four cents per gallon federal excise tax, which amounts to 40 cents per gallon of ethanol. In more than 20 states, exemptions from state taxes add another 40 cents to $1.00 per gallon. Still more subsidy, D. Gale Johnson points out, comes about "through subsidized credit, accelerated depreciation, property exemptions and loan guarantees."

Johnson estimates the cost of producing ethanol from corn priced at $2.50 at the plant ($2.25 at the farm) as approximately $1.80 per gallon. The figure is net of subsidy, and credit is allowed for value of byproducts.[4] Forster and Rask at Ohio State University arrive at a cost of $1.65 for ethanol produced from $2.50 corn.[5] Both sets of estimates are based on 1980 prices of the fuel used to distill the ethanol. Higher prices of either corn or the fuel used in distillation would add to the cost of producing ethanol. The fuel price, in turn, even though coal be burned, is essentially tied to petroleum. All fossil fuels essentially follow petroleum in pricing.

The large amount of energy consumed in manufacturing a gallon of ethanol causes its cost to escalate in step with the price of the product (petroleum) it is displacing. The ratchet sequence so created contradicts the easy rationale that ethanol will become economic once the price of petroleum goes up more.

Magnitudes in an Ethanol Program. It is possible and even likely that new techniques of converting grain to ethanol will be developed and will reduce present inefficiencies. Solar energy might be tapped for distillation; or an enzymatic process could make distillation unnecessary.

Even if that were to happen, the consequences to the food economy would not be circumvented. Diversion of grain into ethanol reduces quantities available for other uses. Relative magnitudes are readily aketched. If the target of 10 billion gallons of ethanol were attained and all were produced by distilling corn, 4 billion bushels of corn would be required. This is half or more of the corn crop. But 10 billion gallons of ethanol are less than a tenth of the more than 100 billion gallons of gasoline produced and used each year. And gasoline is only a fraction of all fossil fuel energy. Converting half the corn crop to ethanol would add at most two percent to the total energy supply -- and on a net basis, less than two percent.

Moreover, diversion of half of all corn to ethanol would reduce exports to a fraction of their recent volume, and U. S. consumers' diets partway toward vegetarian make-up.

Capacity for Increased Farm Output

Traditionally, increased output from agriculture has been sought by enlarging the acreage cultivated. Only in our era have industrial inputs, applied via modern technology, been relied on more as the material base for expanded output.

Sharply rising costs of energy now cast a shadow over relying on that route, and throw the spotlight once again on availability of land.

With transit and chain, land area can be measured. Yet the paradoxical fact is that estimation of our national land reserve is highly inexact. Reasons lie in the complications of (1) quality criteria and (2) cultural practices.

Successive estimates of the area of land potentially available for cropping have shrunk the figure, even as estimates of losses to nonfarm uses have become larger.

Data on size of our land reserve that are quoted most often are those from the Potential Cropland Study conducted by the Soil Conservation Service. The data were published in 1977.[6] A sum-up is presented in report number three of the National Agricultural Lands Study:

> Today, the Soil Conservation Service believes that only about 127 million acres have a high or medium potential to be added to the cropland acreage of about 413 million acres. And of this only 36 million acres can be readily converted to tillage without clearing, draining or other expensive land preparation measures.
>
> SCS also believes that about three million acres of rural land are being converted into housing, water impoundments, highways and other non-agricultural uses each year -- about a third of which is prime agricultural land.[7]

The SCS data do not incorporate estimates of how much of the acreage newly brought into cultivation during the 1970s was erodable or otherwise vulnerable to damage. The consensus is that much land now being cropped needs protection, and that without dramatic, even heroic, measures of protection only modest acreages of land are readily available for addition to the cultivated area.

By sharp contrast, if a major (and expensive) effort were made to protect newly tilled lands, substantial areas could be added.

It follows, too, that presently available land could be preserved if the attrition into non-farm uses could be slowed or stopped. A new philosophy of resource-preservation, and a matching national policy, would be necessary for this to take place.

Hence the land resource is now defined more in terms of human management than of native endowment.

Potential in Intensifying Land Use. The above axiom fits even more the second variable in the land-resource equation, namely, the cultural practices that are employed. Until a couple of generations ago ours was a pioneer nation with almost limitless land area. It was natural and appropriate to farm it extensively, economizing on labor in farming and maximizing return to it. There was little incentive to economize on land or to utilize every parcel to the fullest.

Moreover, when land was abundant it was possible to farm only the gently sloping terrain, so that ample harvests could be obtained without fear of damaging the soil or engaging in costly conservation practices.

Then when land became fully occupied but its scarcity was mitigated by availability of abundant industrial resources including, above all, energy, we developed a capital-intensive agriculture. Capital was applied in order to add further to output per person in farming.

But the goal of maximizing output per person can conflict with maximizing output per unit of land or as a total for U. S. agriculture. One reason this is true is the tendency in capital-intensive cropping practices to cultivate only the lands that, in geometry and slope of fields, lend themselves to use of heavy field machinery. If our agriculture were to be converted even partway to higher labor intensity, including intensification of soil conservation practices, the total output of our farm economy could be increased considerably. In the process, though, output per person in farming would be reduced; and unless price margins widened, income per person also would be less than now.

What about yields per acre? Even without adding more inputs derived from fossil fuels, and apart from any positive effect of intensification, can new successes in the science of agriculture promise relief from somber forecasts of mankind's food supply?

Of the solar energy falling on a corn field, only about one percent is captured and incorporated in the harvested grain. Surely a better efficiency ratio can be managed. Or so it would seem.

Spokesmen for research institutions deprecate the drop in funding for agricultural research, and express doubts about the trend toward contractual funding,

whether private or public, on grounds of lack of continuity and a bias toward applied research.

A Sum-up, and Lessons to be Drawn

Unless the various trends and portents as witnessed in the early 1980s prove highly misleading, the agricultural economy of the United States will face multiple pressures. For the first time in U. S. history the outlets for the bountiful harvests of our agriculture will divide not two ways but three. The three are domestic consumers, foreign buyers, and diversion to production of fuel.

Domestic versus export claims are the more familiar and the easier to deal with. Whether and to what extent to develop the fuel outlet is a new, strange, and perhaps explosive issue.

Norman Rask declares that even though grain-for-fuel offers only modest potential for relieving fuel scarcity it adds a "threat . . . for the availability and cost of food supplies."[8] Earl Heady, sensitive to competition among nations for both food and energy, does not look for "head on" confrontation but believes "there definitely will be international concern on how different countries consume resources and the rate at which they consume them."[9]

Harold Breimyer foresees a "three-way tug of war." Contestants, he observes, are "domestic consumers, who want to sustain their accustomed food consumption patterns; export buyers, who for 10 years have taken the giant share of all increases in U. S. farm output; and the biomass market." "Internationally," he adds, "it is a case of foreign versus domestic outlets for our products. Domestically it is food versus energy (industrial-fuel) claims on agricultural productivity."[10]

What lessons are to be drawn? And if the object to this analysis is to prepare for the contingency of trouble, what form ought that preparation take?

No credence can be given to the easy recourse of disregard, inaction. Abdication of concern or responsibility is invalid. Nor is there reason to believe that market forces alone will assure a satisfactory solution. Public policy definitely will be involved, as indeed it already is.

The greater the stringency in future supplies of farm products, the more inescapable will be a public role, at least in a monitoring capacity.

International trade as carried on by various nations is already a maze of protections, obstructions, subsidies, and other forms of involvement by governments.

The United States has not repeated recently its earlier direct subsidy of agricultural exports and has worked for more liberalization of trade. Yet export promotion facilitates commercial exports, as do governmental loans to exporters plus no-default protection of private lending. Concessionary aid is additional. More significant, though, are the bilateral trade agreements entered into the past five years with the Soviet Union, Mexico, and Peoples Republic of China. These are a major departure from earlier U. S. practice. If we entered into the agreements in order to stabilize our export outlets, our three trading partners were interested or even eager to stabilize -- insure -- their access to those exports. Officials in the three countries apparently believe there will be periods of shortage in world

trading. Their apprehensions may prove more accurate than our complacency.

If shortages should recur in the 1980s other nations, especially traditional buyers such as Japan, also will want guarantees. They will ask for and even expect uninterrupted shipment of the grain and other foodstuffs on which they have come to depend. We will find it economically unwise and politically inexpedient to turn a cold U. S. shoulder.

Question can properly be asked whether an export movement that has continued uninterrupted for many years converts tacitly to obligation. Conceivably there is a moral or long-run-self-interest imperative to continue certain exports even in the absence of formal agreement.

These disturbing issues have long lain dormant primarily because the United States has had an unbroken record of meeting commercial demands made on it (with a couple of glaring exceptions in the 1970s). But if our export capacity becomes suspect in years ahead, those issues will arise to plague policy makers.

In addition, non-commercial exportation cannot be disregarded cavalierly. Considerations of humanity aside, there is a political element in much of our concessionary export trade. Will commitments to Egypt be reneged on, so long as that nation is an ally? Not likely!

Although primary focus may be on export trade, in any future squeeze on food supply domestic consumers will refuse to be treated as uncomplaining and impotent residual claimants. Agricultural groups will wish it otherwise but in the tug of war our own consumers will give their particular tug.

Part of their attention will turn to diversion of grain to ethanol, also a form of domestic utilization of farm products but competitive with food. A massive program for producing ethanol for motor fuel, though adding only a trickle to the total energy supply, could give rise to a major contest that would be not only economic but political. This is not to imply an estimate of the outcome. It is hard to know whether, in a show-down, U. S. consumers would prefer motor fuel or meat.

Our agricultural programs and agricultural trade policies are not designed for the exigencies that might arise in the future. Groenewegen and Cochrane, distrustful of world supply-demand balances, put it that "existing programs in their present form are not adequate for protecting the long-run interests of American consumers and producers in periods when global production does drastically veer below trend."[11] The farmers' reserve of grain makes a positive contribution, as it improves the likelihood that reserve stocks will be available under emergency conditions. But it falls far short of a guarantee. It provides no assurance that during a worldwide shortfall in grain supplies either the quantities of grain committed for export under terms of bilateral agreements, or those of a virtual moral obligation to established customers, can in fact be made available.

It is true that under the farmers' reserve, loans are called when markets strengthen and prices exceed designated levels. Usually, the grain will then be sold and delivered. But that need not happen; and, paradoxically, the more urgent the demand (need) for delivery the less is the likelihood that this will happen. During a speculative boom in commodity markets other sources of financing can often be used to hold supplies off the market.

Whether bilateral trade agreements are a desirable instrument is a topic for policy decision. Pressure to enter into them will be weak or intense depending on the future world supply-demand balance. It is incontrovertible, however, that insofar as export trade in farm products becomes more formalized by agreements or understandings a contingent obligation arises to assure performance under them. Policy implications are manifold and complex. But implications there are: and they cannot be disregarded.

Moreover, negotiated terms of export trade will assuredly introduce policy considerations in domestic availability of farm products for consumption as food, amplified by issues in utilization for ethanol or other form of energy.

Capstone to this review may be an epigram that policy for agriculture may have been simpler when perennial surpluses were the problem, even though it was not so regarded at the time.

FOOTNOTES

1 Quoted by James Risser and George Anthan, in Des Moines Sunday Register, November 23, 1980, p. 15A.

2 This and other descriptions of federal programs relate to fiscal year 1980-81. Several major changes were proposed, as of early 1981, to take effect in 1981-82.

3 Abner W. Womack and Maury Bredahl, "The World Dimension to U. S. Agricultural Trade," International Affairs and U. S. Agriculture, University of Missouri-Columbia, Agricultural Experimental Station, Special Report 159, 1980, pp. 19-33.

4 D. Gale Johnson, "Agricultural Policy Alternatives for the 1980s," paper for conference on Food and Agricultural Policy, American Enterprise Institute, October 2-3, 1980.

5 D. Lynn Forster and Norman Rask, "Role of Ethanol in Our Energy Transition," Socio-Economic Information, Ohio State University, Cooperative Extension Service, December 1980.

6 Potential Cropland Study, U. S. Department of Agriculture, Soil Conservation Service, Statistical Bulletin No. 578, 1977.

7 W. Wendell Fletcher, Farm Land and Energy: Conflicts in the Making, American Land Forum, 1980, p. 7.

8 Norman Rask, "Biomass: Its Utilization as Food and/or Fuel," Ohio State University, Department of Agricultural Economics and Rural Sociology, ESO 765, 1980, p. 3.

9 Earl O. Heady, "International Implications of Limited Resources," Iowa State University, Department of Economics, November 5, 1980, pp. 18-19.

10 Harold F. Breimyer, "Land: Agronomics, Economics, and Institutional Stress," University of Missouri-Columbia, Department of Agricultural Economics Paper No. 1981-1, p. 4.

11 J. R. Groenewegen and W. W. Cochrane, "A Proposal to Further Increase the Stability of the American Grain Sector," American Journal of Agricultural Economics, November 1980, pp. 806-11.