

Enhancing Competitiveness: Infrastructure and Agriculture

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In this paper, I broaden the term "infrastructure" to mean the total **support structure** of a global **agribusiness** system and the **institutions** and arrangements that help to coordinate the **functions** and flows of the system as well as the **functions** that are performed in the system. These **functions include input farm supplies**, farming, assembling, transporting, storing, processing and distributing final food and fiber **products** to the **ultimate** domestic and international consumer.

To assess how U.S. **agribusiness** has **used infrastructure** and **institutional** arrangements to compete in global **agribusiness**, one has to place U.S. **agribusiness** in its historical setting.¹ After World War II, the objective of U.S. farm policy was to maintain relatively high price supports so that the farmer **would** not bear the major **burden** of adjustment as the U.S. food system made the transition from a wartime to a peace time economy. **During** this **adjustment** period, high domestic price **supports** enabled farmers to **continue purchasing** farm supplies and capital improvements for their farms. **Because** these high price **supports** acted as a price **umbrella** for our global grain competitors, the United States became a **residual supplier** to the export market. The government paid a cost differential between the lower world price for U.S. farms commodities and the domestic high price **supports** to exporters so they **could** sell in the world market.

¹ Agribusiness, as developed at the Harvard Business School, includes all of the interrelated private and public policymaking enterprises, from farm supply, farming, and processing through distribution to the ultimate consumer — including all private and public coordinating mechanisms that hold the commodity system together and enable them to adjust to technological, political, social, and economic change. Agribusiness contains large and small-scale participants, irrespective of the economic and political systems involved.

Even with the **PL. 480** Program that shipped some \$25 billion worth of commodities overseas, surpluses began to build up in the United States. These surpluses, in turn, resulted in a subsidized storage program to store the surpluses and a guaranteed occupancy and payment program for storage at both the on-farm and off-farm levels. Similarly, both political parties encouraged farmers to play a more active role in manufacturing and supplying their inputs and processing and distributing their food products, as well as making full use of the government storage program through the improved credit facilities of the Farm Credit Bank for Cooperatives. The domestic storage program resulted in the development of a grain storage capacity large enough to hold grain reserves not only for the United States but for the world. We became, in essence, the buffer zone or shock absorber for any change in the global food system. We could afford to do so in a less volatile surplus food production-oriented world, with low interest rates, fixed exchange rates, and prices that, except for wartime explosions, varied less than 10 to 25 cents a bushel. Our concessional **PL. 480** sales and our contributions to the World Bank were used to build up postwar economies, especially those of the developing world. At least 25 percent of these expenditures were for agribusiness projects with major emphasis on infrastructure, such as roads, irrigation, credit, and farm extension systems.

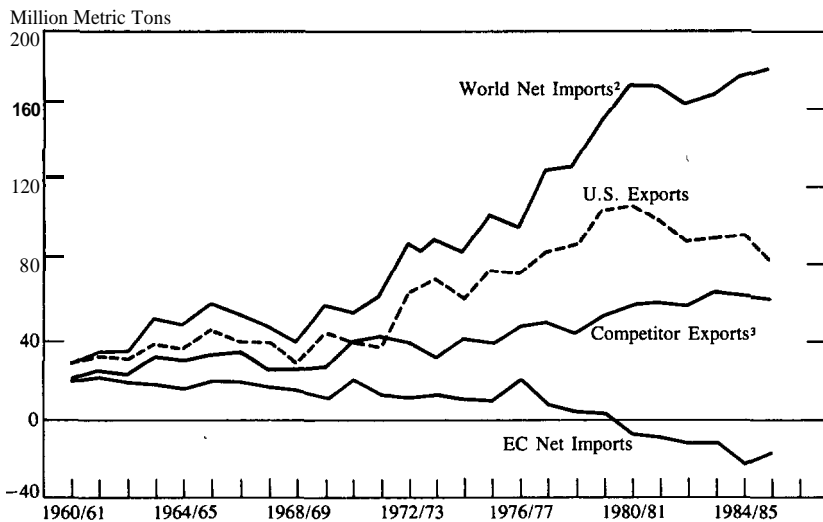
In 1972, when the Soviet Union changed from a global agricultural commodity exporter to an importer, a global food economy changed from "buyers market" to a "sellers market". Product differentiated food processors found that they really were part of an agribusiness vertical food chain, as did fast-food operators. Instead of the U.S. government price support program being a substitute futures market, commodity futures markets came into their own prominence. Risk management tools in the form of long-term futures contracts became critical to all participants in the food system. Just as sourcing became global, so did marketing. By the early 1980s, over 40 countries imported one million tons or more of grain a year compared with a handful a few decades before.

Consolidation in the number of firms has occurred in every aspect of on-farm and off-farm activity at a national level at the same time global competition has increased at every level. You can buy **Coca-Cola** and **Pepsi-Cola** on a global basis. You can find **McDonalds**, **Dunkin' Donuts**, and **Kentucky Fried Chicken** outlets circling the globe. Farm machinery, pesticides, and fertilizer firms compete the

world over, as do processed food companies from Heineken Beer to Cadbury-Schweppes products. Yet these sales are also tied to the same governmental market access constraints as confront the agricultural commodity firms.

By 1985, as previous speakers have noted, we once again live in a surplus food economy, with those nations and individuals that need the food the most not having the funds to buy it or the resources to produce it. Not only have we moved from a sellers to a buyers market, but the global interdependency of the 1970s and early 1980s has developed market structures and **processing capacities** to more efficiently serve that market. We built a totally vertical food system and trading system around an expanding global market that not only stopped expanding but went into a decline. The United States, in essence, has a declining market share of a declining global food system (Chart I). Excess capacity exists in each vertical structure from input farm supplies, farming, transportation, **processing**, and distribution. Once again major countries and economic regions have insulated their agribusiness

CHART 1
Major Components of World Grain Markets¹



¹Total wheat and coarse grain

²Net imports by world less U.S., EC, and competitors

³Canada, Australia, Argentina, South Africa, and Thailand

food system from the world food system, with the result that the United States and the developing world become the buffer for the system. Those that are in the weakest position to make the adjustment are forced into adjustment, namely, the U.S. farmer, the U.S. consumer, and selected developing country producers and consumers. Many countries that believe in global free markets in expanding markets and rising price levels find it economically, politically, and socially difficult to make downward price shifts to world price levels that drop suddenly over a short period of time.

1985 and beyond

How then do current structures affect the U.S. agribusiness competitive position in the future and what actions can private and public managers take both to restructure U.S. agribusiness and to make it more competitive? What global strategies are available to U.S. agribusiness firms and institutions?

In 1985, taking a system's approach to global agribusiness, one notes the overall commercialization of global agribusiness with an increase in purchased farm supplies and food processing and distribution (Table 1). As mentioned previously, there is a large carryover of cereal

TABLE 1
Global Agribusiness Estimates for 1950 and 1980
(billions of current dollars)

	<u>1950</u>	<u>1980</u>
Farm Supplies	44	375
Farming	125	750
Processing & Distribution	250	2,000

Source: Author's estimates based on discussions with USDA economists.

stocks—almost reaching the 1982-83 levels. The United States continues to be the major inventory holder in the world. These carryovers, together with net international transfers from the developing countries, have resulted in a decrease in purchasing power that has led to a decrease in major commodity prices on a global basis. This has occurred even though global food production per capita has been **increas-**

ing at a decreasing rate (Table 2). At the same time, most nations' food policy priorities are such that they prefer to be as self-sufficient as possible.

TABLE 2
Global **Food** Production Per Capita

<u>1951-53—1959-61</u>	<u>1959-61—1968-71</u>	<u>1969-71—1979-81</u>
1.42%	0.62%	0.23%

Sources: U.S. Department of Agriculture and FAO

This has led to an increase in the commercialization of agribusiness in both developed and developing countries as sophisticated input and processing operations have been created. The infrastructure of the key players, such as China, India, and the USSR, has also increased. World agribusiness still employs about 50 percent of those employed in the world and major agribusiness systems in major countries account for 26 percent of the world's GDP. Similarly, while 48 percent of consumer expenditures are still spent on agribusiness products, the commercialization of agribusiness has seen this reduced from 69 percent in 1950 (Table 3). Although export markets are critical for U.S. agribusiness,

TABLE 3
Agribusiness as a Percent of GDP
Of Selected Major Agribusiness Countries
(weighted average)

<u>1950</u>	<u>1960</u>	<u>1970</u>	<u>1980</u>
41%	34%	27%	26%

Source: U.S. Department of Agriculture and FAO

the industrialization of the world economy has reduced agribusiness trade as a percentage of total global merchandise trade even during the sellers market of 1980 from 46 percent in 1950 to 20 percent in 1980. This is one indication of why our trade representative can look at agri-

business as only one bargaining chip at the global trade table (Table 4).

TABLE 4
**Agribusiness Trade as a Percentage of Total
Merchandise Trade of Major Exporting Countries**

<u>1950</u>	<u>1960</u>	<u>1970</u>	<u>1980</u>
46%	39%	24%	20%

Source: U.S. Department of Agriculture and FAO

To be competitive in this new buyers market, the global agribusiness economy becomes even more difficult when one realizes that one does not make a sale on price alone. Most sales involve long-term agreements and many of the purchases are made by state trading organizations (Tables 5 and 6). Countries want to know not only how the sale

TABLE 5
Bilateral Agreements as a Proportion of World Trade

<u>Selected Countries</u>	<u>Wheat</u>	<u>Coarse Grains</u>
Range of Percentages of Average Imports 1979-82		
Brazil	12%–47%	—
China	89%–100%	100%
Egypt	16%	—
Libya	67%	100%
Mexico	20%–40%	17%
Poland	15%	15%–25%
U.S.S.R.	31%–50%	48%–53%
Yemen	67%–83%	—
World Total	43%–56%	37%–45%

Source: FAO

TABLE 6
**Wheat Imports
(percent)**

	<u>1960</u>	<u>1965</u>	<u>1970</u>	<u>1975</u>	<u>1980</u>
Free Traders	2.9	2.7	5.2	4.3	3.2
State Traders	62.6	77.9	65.4	75.1	80.9
Variable Levies	34.5	19.4	29.4	20.6	13.6
Licensing	0	0	0	0	2.3

Source: U.S. Department of Agriculture

helps them but what type of reciprocal trade agreement can be made for their products and what type of technology accompanies the product to aid in the development of their country. This, in turn, leads to new types of firms, institutions, and joint ventures to respond to these new market needs.

The consolidation of global agribusiness has also developed new types of organizations to serve the customer on a more direct basis. For example, Conagra, through acquisitions, now has a billion dollar agricultural chemical distribution system in the United States and, with the recent acquisitions of a German trading firm, cannot help but look at the global market in a similar fashion. It is striking to note that one million farmers each with over 200 hectares of land account for most of the commercial farm commodity sales in the world, even though there are a total of 140 million farmers (Table 7). Similar consolidation is occurring at every level of operation in every nation.

TABLE 7
Number of Farms in the World
(millions)

	<u>1950</u>	<u>1960</u>	<u>1970</u>	<u>1980</u>
World	92	109	133	140
Under 5 Hectares	72	84	108	118
Over 200 Hectares	0.7	0.9	1.0	1.0

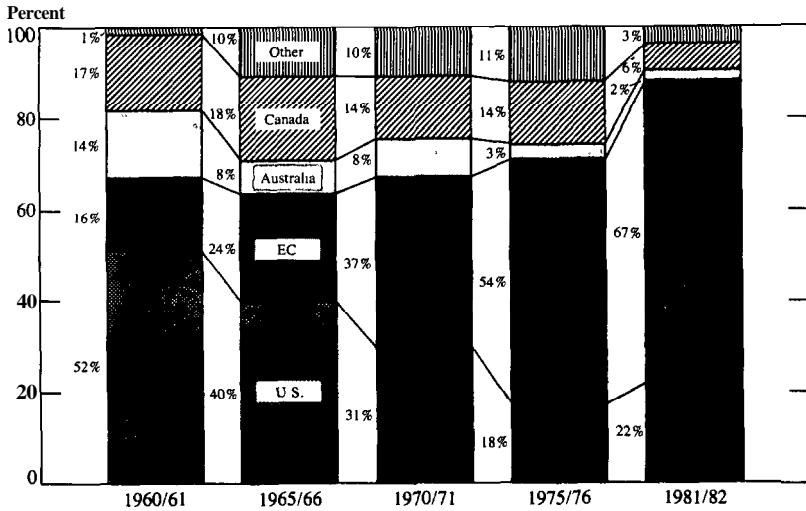
Source: World Bank

The competition has become globalized for sourcing and for markets. Market orientation, product differentiation, service differentiation, and financing engineering as well as market access, are the competitive tools required by every segment of U.S. agribusiness. Our potential strength in value-added products has not been fully developed, partially because we were lulled to sleep first by historical high domestic price supports in the previous buyers market of the 1950s, 1960s, and early 1970s. We were then further lulled to sleep by the sellers market of 1972-81. That luxury is no longer available to us.

In addition to fighting traditional market-oriented battles on a global basis, we have to compete with such regions as the European Community (EC), which have insulated their producers to the point that they produced surpluses for their domestic market. They then turned to processing as an answer that, in turn, shifted the surplus

from raw commodity to processed product. They then subsidized the processed product in the international market and the result is shown in Chart 2. The EC global share of the flour market increased from 16

CHART 2
Relative Share of World Exports of Wheat Flour
Commercial and Special Transactions
(1960/61—1981/82)



Source: IWC Record of Operations; USDA

percent to 67 percent in 1981-82. We have to place global agribusiness under the trade jurisdiction of GATT, with or without the EC's participation, to create a global climate in which there is a new understanding of the rules of the game.

In addition to the new types of markets and new types of competition, our former customers are becoming our competitors, thus making a complicated global agribusiness market even more competitive. India now has 34 percent of its cropland irrigated, using 50 percent high-yielding varieties in a variety of crops, going from 294,000 tons of fertilizer in 1960 to 7.8 million tons in 1984. They also have had credit available to their producers increase from \$286 million to \$2.9 billion. In addition to this type of infrastructure change, they have created

imaginative institutions such as the Amul Dairy Cooperative, not only to involve their landless labor and small-scale and medium-scale producers but in a way that **improved** the quality of their dairy and buffalo herds, their end consumer products, and their byproducts. Amul Dairy developed brand names of chocolate candies, drinks, and quality cheese products as part of a practical market-oriented dairy **system**—paralleling in many ways the creative market orientation of successful U.S. **cooperatives**, such as Ocean Spray, that not only develop products based on their producer's crop but practice "creative destruction" by utilizing other flavors—natural and synthetic—to broaden the base of the market opportunities for their producer-owners.

Similarly, the USSR has increased its infrastructure through an increase in irrigation, fertilizer, farm machines, and chemicals. Irrigated land now accounts for 12 percent of the land on which 25 percent of their major crops are produced. The country is making a major effort to improve roads, storage facilities, and communication to develop more specialized agribusiness sectors in every major region of the country. There is no doubt that firms such as Archer Daniels Midland (ADM), proposing turnkey operations to the USSR for efficient corn and soybean processing operations as well as drying and **assembling** equipment to cut down waste, are providing services that fit into the new long-term agribusiness development of the country. It is conceivable that over the next several years the USSR will again become a major exporter of food rather than a major importer. It is also true that just as the EC has encouraged agribusiness intra-trade within its system, so has the Soviet Union with its partners in COMECON.

China, too, has made great strides in freeing up its rural economy, increasing rural incomes by 40 percent and ending up exporting corn and soybean meal as well as reducing its imports of wheat. In addition, China has welcomed joint ventures between cooperative and proprietary corporations and provincial governments. Many of these projects are long-term in nature, from a 20-year integrated hog operation producing over \$2 billion of hogs for the Hong Kong market to an integrated vineyard producing wine and brandy for **Remy Martin** and the domestic **and export** market. China also has benefited from **World Bank** loans that started out at the \$200 million level and are currently at the \$2 billion level.

In addition to the existing technology being better utilized in many of the major developing and centrally planned economies together with the improvement in their infrastructure and the development of

private-public joint ventures in agribusiness, many of these nations are most interested in having their agribusiness systems leap-frog the development process through the use of biotechnology. Incentives are given in each of the countries cited above to develop their own internal biotechnology and work with other private and public entities to acquire this knowledge that could be utilized in special country problems from lactose toleration to the improvement of drought, cold, and salt resistance varieties of seed. Technology and turnkey operations are specific ways of differentiating the sellers of other inputs and food and commodity products to the developing and centrally planned economies.

Tables 8 and 9 highlight ways the \$3 billion biotechnological investment in the United States may affect agribusiness. U.S. firms have

TABLE 8
Entry Points for Biotechnology in Agribusiness

Farm Input	Seeds, fertilizer, disease, pesticides, growth hormones, herbicides, fungicides, plant growth regulators, feed additives, vaccines, antibiotics, bacteria
Processing	. Low cost processing of fructose and aspartame
Distribution	Vege-snacks, milk shakes
Consumption	Diagnostic and therapeutics for cancer, cell functions

TABLE 9
Biotechnological Trends

1. Number and type will grow
2. Shorten cycles
3. Breed of hybrid managers
4. Private and public cooperation
5. Entrepreneurship
6. Market access

been investing at the rate of \$550 million a year; the EC has been investing \$355 million a year, and Japan \$150 million. Dr. Michael Phillips' paper does an excellent job of setting forth the potential of this new technology. Thus far, the scientific projections have erred on the side of conservatism. Scientists have been making breakthroughs at a faster rate than they anticipated. Therefore, I would assume that the

application of these findings will also occur more rapidly, from the growth protein for milk cows to phenylalanine from corn to specially created vege-snacks for consumers. This technology may lead to direct selling of selected agricultural chemical products to large-scale producers, as well as to joint ventures with global grain firms to provide an international market intelligence system for their technical products. This technology will shorten production and estrus cycles, lead to greater private and public cooperation, and produce a new breed of management leaders from the technical and R&D sections of many corporations and cooperatives.

Implications for U.S. agribusiness competitiveness

U.S. agribusiness is faced with a further decline in its traditional developed and centrally planned agribusiness markets. It will have to renew efforts to capture the growth markets of Southeast Asia, Latin America, Africa, and the Middle East. To capture these new markets will require bridge loans from the World Bank and others and a better understanding and utilization of these financial institutions than currently exists in many U.S. corporations and cooperatives.

Global competition requires a restructuring of U.S. agribusiness both internally and externally. New alliances are occurring, such as **ADM-Toepler-Growmark**, that encourage domestic sourcing and global market intelligence. Other alliances, such as Continental Grain and the A. E. Staley Co. and American Maize and Quincy Soybean Company, will become more common to provide product quality differentiation in response to specific market, product, and logistics needs of global consumers.

Global customers require a complete package of goods and services, including financial and turnkey engineering. A new joint venture of the Louis Dreyfus Company and the German metallurgical firm **Metallgesellschaft Services Inc.**, provides these services together with counter-trade that enables effective sourcing and market access. This is only one example of firms responding to these needs.

U.S. farmers are not the enemies of farmers in other lands. They work out joint ventures, such as in the case of U.S. and EC farmers in their joint ownership of Toepler (a German trading firm) with ADM, the other owner. A raspberry farmer in Oregon has a joint venture with a raspberry farmer in Chile, so that together they have seasonal overlaps to satisfy the raspberry market in the United States.

Successful U.S. food processors use European technology and Euro-

pean flavoring to develop products for the U.S. market and for global markets. In essence, they use the technology of competing firms in competing markets just as others use American technology to compete in U.S. markets.

Historically, the U.S. agribusiness system has not had to compete on a global basis. We have been order takers, government program suppliers, or have had people beat a path to our door for technology. We must now compete as never before. We have to maintain the technological lead that we have in molecular genetics and utilize this technology through the creative managers we have in this country to satisfy global food needs in an imaginative and market-oriented basis. We also need to cooperate with nations that want to have agribusiness placed under GATT and abide by new trading rules to have a common trading system with or without the EC. Finally, we have to continue to build on our managerial strengths in both the private and public sector and build unique global institutions and arrangements that bypass the national political pressure groups that keep governments from working together more effectively to improve a truly global interdependent agribusiness system.