Consumer Preferences and Concerns Shape Global Food Trade

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Twenty years ago, bulk commodities that consisted primarily of grains and oilseeds accounted for most agricultural trade; however, in recent years processed and semi-processed products have jointly accounted for two-thirds of total agricultural trade. A number of forces in both developing and developed countries are driving these changes, particularly income growth. As inflation-adjusted per capita incomes increased during the past two decades, more than doubling in many countries, food purchasing power among most consumers also increased. Due to increased caloric intake and population growth, imports of grains and oilseeds by developing countries have increased, while developed country imports of these commodities have remained stagnant.

As incomes rise, wealthier consumers, especially in developed countries, seek out the variety of high-value food imports. High-value food products are nonbulk commodities that either require special handling, such as fresh produce, or are processed, which adds substantial value beyond the farm level. Processed foods are edible foodstuffs that have been transformed from their original post-harvest states to either semi-processed products (flour and meal) or final products (bread and breakfast cereal).

According to United Nations (UN) trade data, high-value food imports increased in the 1990s not only in developed countries but also in developing countries. For example, from 1994 to 1999 the value of Egypt's processed food imports increased 51 percent to $689 million. However, despite trade growth in developing countries, the much larger volume of processed food trade among developed countries has primarily accounted for the shift in world agricultural trade from grains to high-value food products.

While the trade in bulk commodities has decreased in share since 1980 to less than 30 percent of current world agricultural trade, the share of pro-cessed and semi-processed products has increased (fig. 1). Processed high-value products, such as meat, beverages, bakery products, and snack foods, account for about 34 percent of global food trade, up from 18 percent in 1980. Trade in intermediate processed products, which consists of semi-processed commodities,

The spread of urbanization, which often introduces consumers to aggressive marketing techniques and increased supplies of domestic and imported goods, has influenced global food preferences.

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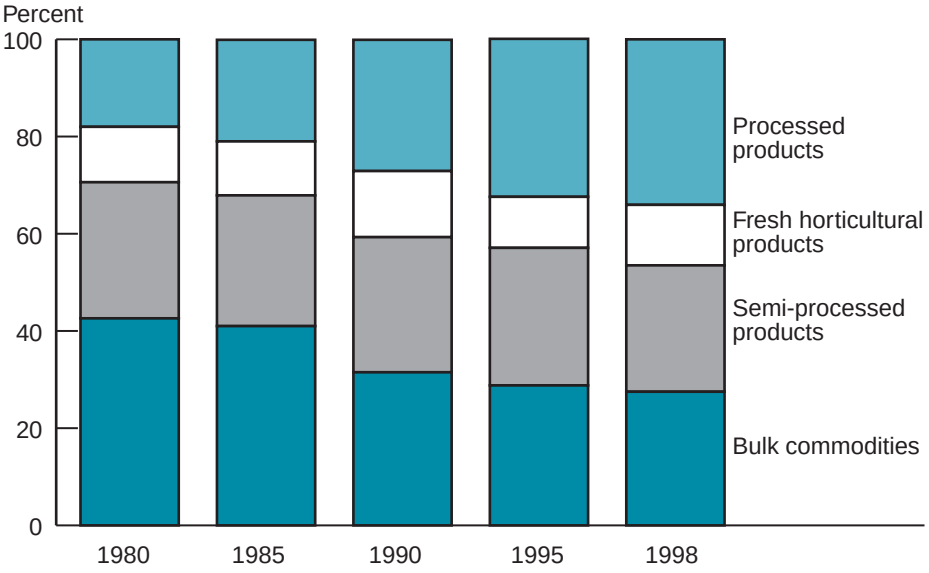
such as vegetable oils, oilseed meals, and flours, has kept pace with world agricultural trade and maintained its share of world trade. The fresh horticultural products group represents the smallest of these aggregate categories and its 12-percent share of world agricultural trade has remained almost unchanged during the past 20 years. The perishable nature of fresh horticultural products constrains trade, although technological advances to extend shelf-life have enhanced the potential for increased produce trade.

The shift in U.S. agricultural exports has been even more pronounced than changes in world trade composition. Bulk exports accounted for nearly 70 percent ($28 billion) of the value of total U.S. agricultural exports in 1980 but declined to less than 40 percent ($19 billion) in 1998 (fig. 2). Lower grain prices and slower volume growth triggered this change. Rising U.S. meat exports in response to growth in world meat demand also represent a key element in the changing composition of U.S. exports. For example, between 1980 and1998, the United States expanded its meat exports fivefold to countries where meat consumption rose, such as Japan and Hong Kong.

Growth in two-way trade of high-value food products—that is, the same country exports and imports products within the same industry—has also helped increase global food trade. In this scenario, trade can expand without growth in consumption as the foreign share of consumption increases. For example, the United States exports higher valued beef to Japan while at the same time it imports a greater volume of lower valued beef from New Zealand. In dairy trade, however, the United States imports higher valued products, mainly cheeses from Europe, but exports lower valued products, such as powder milk and whey products to Mexico.

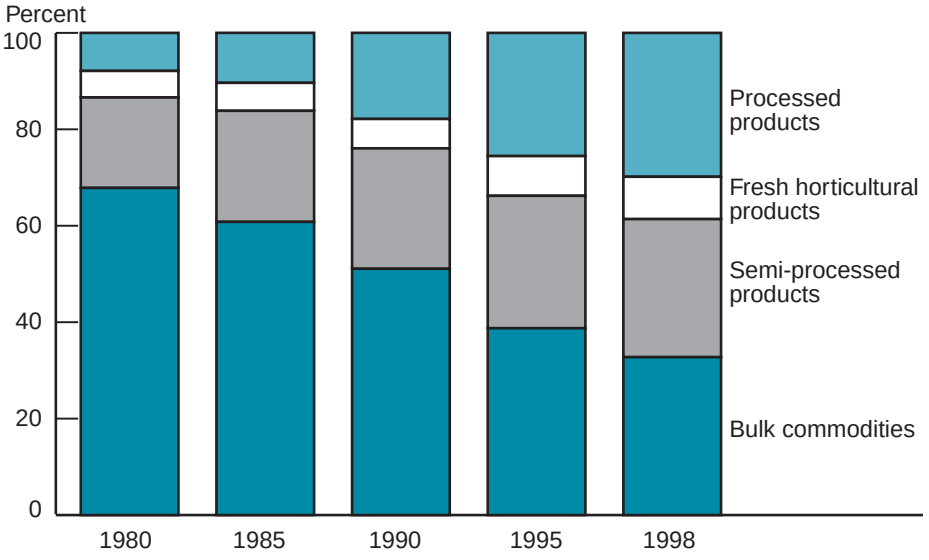
Growth in intra-industry trade is significant, especially among high-income countries, and is partly attributed to foreign direct investment (FDI). FDI is investment in a foreign entity or affiliate in which a parent company holds a substantial, but not necessarily a majority, ownership interest. FDI and trade are often complementary and fuel bilateral trade growth between countries (see "U.S. Food Companies Access Foreign Markets Through Direct Investment" elsewhere in this issue). For example, the United States and Canada have greatly expanded FDI sales and trade in processed fruit and vegetables. Demand for foreign

Figure 1
World Grain Trade Decreased as Processed Food Trade Increased



Source: U.N. COMTRADE, ERS classification.

Figure 2
U.S. Bulk Commodities Export Share Dropped About 30 Percent During 1980-98



Source: USDA's Economic Research Service.

brands also drives increased trade in packaged or bottled products, such as bakery products, beer, and wine.

Finally, advances in transportation technology over the last 30 years have helped increase global trade of high-value food products. Packaging innovations, fruit and vegetable coatings, bioengineering, and other techniques that reduce deterioration of food products have helped extend the marketing reach of perishable products. Perishable products can now be shipped thousands of miles at lower costs with no substantial loss in freshness and quality.

Lower transportation costs have a similar effect on trade as tariff cuts: they reduce transaction costs, or the wedge between the product price in the exporting and importing countries, thus stimulating trade. However, although new developments in ocean shipping have reduced shipping costs and made it possible to preserve the quality of perishable products, trans-ocean transportation costs are still higher for many perishable products than for raw agricultural products, such as cotton, or nonperishable products, such as nuts and raisins.

Income Growth Boosts Food Consumption

Rising incomes and their impact on levels of food consumption have been one of the most important determinants in explaining shifts in global food demand and trade. Real income, as measured by gross national product (GNP) per capita in inflation-adjusted U.S. dollars, grew on average by almost 100 percent globally during the last four decades. Although 1998 inflation-adjusted per capita income levels were just over $500 for low-income countries compared with almost $28,000 for high-income countries, the rate of income growth among low-income countries (221 percent between 1960 and 1998) has generally surpassed that for higher income countries. The World Bank defines low-income countries as those with 1998 GNP per capita below $760, middle-income countries as those with 1998 GNP per capita between $760 and $9,360, and high-income countries as those with 1998 GNP per capita above $9,360. Countries in the low- and middle-income groups are generally considered to be developing countries.

The only available measure of food consumption across countries is the supply, or the availability, of food in a market. Per capita food availability on a global basis has increased from about 2,300 calories per day in 1961 to almost 2,800 in 1998. In addition to changes in food availability, the basic sources of calories have changed, with animal and horticultural products accounting for a growing share of total calories consumed at the expense of root and tuber crops, such as cassava and sweet potatoes. Per capita global availability of meat and fruit and vegetables increased by more than 60 percent between 1961 and 1998, while the supply of roots and tubers decreased by over 21 percent (table 1). During the same period, world cereal supplies increased by almost 17 percent.

Shifts in food consumption patterns tend to vary among countries based on the level of economic development. In high-income countries, per capita consumption (as indicated by food availability) of both cereals and roots and tubers decreased between 1961 and 1998, while that of meat and produce increased substantially. With the exception of roots and tubers, food supplies substantially increased in middle-income countries. In low-income countries, where hunger remains a concern despite recent economic gains, decreases in root and tuber availability were more than offset by dramatic increases in per capita supply of all other food types. Despite these supply gains, per capita availability of meat and fruits and vegetables in low-income countries remains far below that of middle- and high-income countries. Cereal supplies increased almost 32 percent in low-income countries and 12 percent in middle-income countries. These increases can partially be attributed to increased demand for livestock feed, resulting from the increased demand for meat.

Differences in total food availability between developed and developing countries are also reflected in their respective food budget shares (table 2). Low-income countries spend on average 47 percent of their total budget on food compared with high-income countries that on average spend only about 13 percent on food. Staple food products, such as cereals, fats and oils, and fruits and vegetables, account for a larger share of the total food budget in low-income countries than in higher income countries. (Because data for fruit and vegetables include roots and tubers—cereal substitutes in poorer countries—fruits and vegetables are categorized here as staples.) Meat and dairy budget shares are greater for high-income countries.

How countries respond to rises and falls in income helps policymakers assess future food needs, trade, and demand for associated transportation and infrastructure facilities. The income elasticity for food, which is a measure of the responsiveness of the quantity of food demanded to a change in income, is higher for poorer countries. Thus, when incomes fall by 1 percent in both low- and high-income countries, poorer countries make bigger cutbacks in food expenditures than wealthier countries. These cutbacks, however, are not implemented evenly across the different food groups. To meet their basic food needs, low-income countries make smaller expenditure reductions in staple food consumption, such as cereals (0.56 percent), and larger cuts in higher value food

consumption, such as fish (2.77 percent) and dairy (0.93 percent).

Low-income countries may switch to cheaper products within a food group when the price of food in that group increases, such as substituting corn for wheat when overall cereal prices increase. Middle-income countries, with greater purchasing power, are more likely to switch to products outside a food group when prices for a particular food group change, such as substituting meat and horticultural products when cereal prices increase. In high-income countries, food is a small part of total household budgets and food price changes may lead to small or no adjustments in the composition of food consumed.

Table 1
World Supply of Meat and Produce Has Risen

Countries	1961	1970	1980	1990	1998	Change, 1961-98
	Pounds per capita					*Percent*
Cereals:						
Low-income countries	283.3	326.7	346.3	381.6	373.5	31.8
Middle-income countries	275.6	288.8	308.4	313.5	308.2	11.8
High-income countries	269.6	246.3	236.6	238.3	248.9	-7.7
World	298.3	317.0	329.8	352.5	348.8	16.9
Roots and tubers:						
Low-income countries	45.2	47.2	40.1	32.6	35.5	-21.5
Middle-income countries	32.2	31.1	27.3	25.8	28.9	-10.3
High-income countries	38.4	34.0	32.2	32.2	32.6	-14.9
World	41.9	42.1	35.9	30.9	32.8	-21.6
Fruit and vegetables:						
Low-income countries	158.3	133.6	143.3	200.2	240.0	51.7
Middle-income countries	259.0	282.9	332.5	345.9	356.9	37.8
High-income countries	336.6	390.0	411.8	476.6	493.2	46.5
World	223.8	228.8	246.5	218.7	373.0	66.7
Meat:						
Low-income countries	11.7	16.8	22.0	32.4	48.9	318.9
Middle-income countries	50.0	59.3	74.1	83.1	87.7	75.3
High-income countries	119.5	142.9	167.8	177.9	189.2	58.3
World	54.0	62.8	71.0	74.1	86.9	60.8

Note: The world average may not necessarily reflect the average of the three country groupings because many of the former Soviet and Yugoslav countries are excluded in the groups.
Source: FAO Food Supply Data, 2001. Countries are grouped according to the World Bank definition.

Table 2
Low-Income Countries' Budget Share Spent on Food Is More Than Three Times That of High-Income Countries

Consumption category	Countries' budget shares for food			Countries' income elasticity for food		
	Low-income	Middle-income	High-income	Low-income	Middle-income	High-income
	Percent			*Percent change*		
Food as share of household budget	47	29	13	.73	.58	.29
Food groups as share of food budget:						
Cereals	28	20	16	.56	.41	.19
Meat	18	22	25	.82	.65	.33
Fish	5	5	6	2.77	.92	.43
Dairy	9	13	14	.93	.71	.35
Oils and fats	7	5	4	.58	.43	.21
Fruit and vegetables	23	21	20	.66	.53	.27
Other food	11	13	15	.80	.63	.32

Source: Regmi, A., M.S. Deepak, J. Seale, and J. Bernstein, 2001.

Urbanization Fuels Food Consumption Increases

Widespread growth in urbanization has also helped shape global food preferences in recent decades. Urban areas have more effective marketing facilities and a greater supply of products from domestic and foreign producers. Urban areas are also centers of economic opportunity and have a greater percentage of women working outside of the home. Increased opportunity cost of women's time increases the demand for nontraditional fast food in many countries.

The effects of urbanization on diets differ from country to country. For poorer countries, urbanization may initially lead to the substitution of purchased cereals and processed foods for home-grown and prepared staples, such as rice and cassava. Urbanization has resulted in significant increases in wheat consumption in Asian countries, such as China, India, and Indonesia, while the consumption of coarse grains (corn and sorghum) and cassava has declined. Similarly, consumption of cassava and coarse grain has declined in urban areas of western African countries, while consumption of rice has increased. With further increases in income levels, consumption of more expensive sources of nutrients, such as meat, fruit, and vegetables, increases, while the consumption of lower cost staples, such as roots and tubers, decreases.

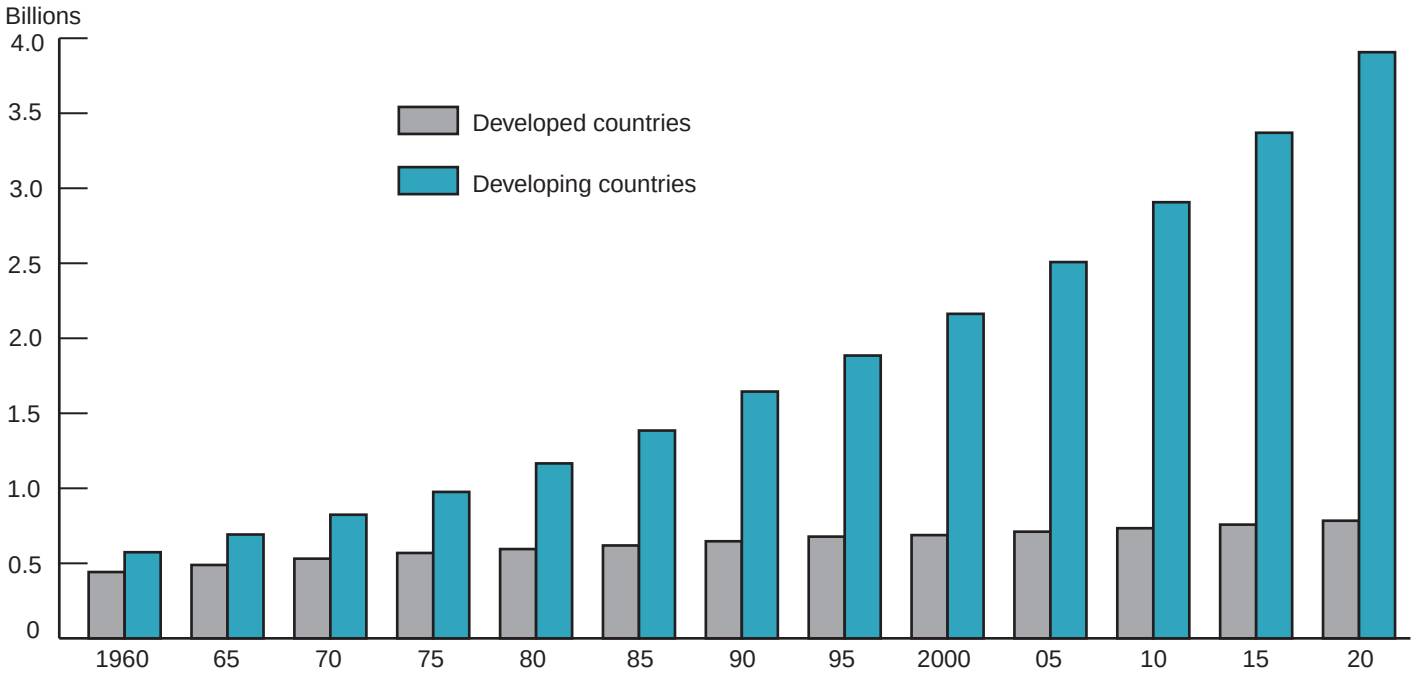
The UN's Food and Agriculture Organization reports significant increases in meat and produce consumption among urban areas of several developing countries. For example, per capita meat consumption in urban Indonesia increased by about 70 percent between 1978-87, while meat consumption in rural areas declined during the same period. Also, dual-income households (occurring mainly in urban areas) have less time for cooking, resulting in increased preferences for more highly processed, convenience foods in many countries.

In the future, urbanization will primarily affect developing countries. In 1960, developed countries accounted for about one-third of the global urban population. By 1998, developed countries accounted for only about one-fourth of the global urban population of 3 billion (fig. 3). Assuming the 1990s' rates of growth continue, the urban populations in developing countries will double to nearly 4 billion by 2020. Therefore, the effect of urbanization on future food consumption changes will be most evident among developing countries.

Health Concerns Influence Food Choices...

Along with growing urbanization and the associated increases in levels of information dissemination and education, health concerns have become an increasingly important factor in consumers' food preferences in recent years. For example, nutritional recommendations devel-

Figure 3
Urban Populations in Developing Countries May Double by 2020



Source: The World Development Indicators, The World Bank, 2000.

oped by the U.S. Departments of Agriculture and Health and Human Services advise Americans to reduce their fat intake and eat five to nine servings of fruits and vegetables per day. Various other public and private campaigns seek to inform consumers of health benefits associated with different food products.

Accordingly, demand for food in the United States has changed considerably in recent years. Partly due to health concerns, red meat's share of total U.S. meat consumption declined from 79 percent in 1970 to 62 percent in 2000, while poultry's share increased from 21 to 38 percent during the same period. Similarly, per capita fruit and vegetable consumption in the United States increased 25 percent between 1977 and 1999.

Awareness of and attitudes toward health issues affect consumers' consumption decisions. Age and education also influence food demand. Studies in Japan and the United States showed that older individuals were more health conscious and consumed greater quantities of produce, while younger consumers consumed more meat and alcohol. Individuals with higher levels of education were found to have more healthful eating habits.

…As Do Concerns About Safety, Ecology, and Animal Welfare

Increased affluence and education not only change consumers' food preferences but also increase the demand for better quality and safer food products among consumers in developed countries. Countries vary in demand for quality and safety in foods. How countries perceive and handle risks from disease-causing organisms is generally based on access to and use of advances in science, detection technology, and mitigation methods. Wealthier countries with more information about food safety risks tend to demand more stringent food safety standards on both domestically produced and imported food.

Major food safety incidents in recent years have resulted in lasting changes in consumer perceptions and food purchasing patterns in certain developed countries. For example, the 1996 announcement in Great Britain of a possible link between bovine spongiform encephalopathy (BSE), or mad cow disease, in cattle and a new strain of Creutzfeldt-Jakob Disease in humans led to dramatic declines in beef consumption in Europe, particularly in the United Kingdom. This incident also resulted in import bans on British beef and products by trading partners, leading to significant economic losses for associated industries. In the first year of the crisis, the United Kingdom's total economic loss from BSE was estimated at $1.2-$1.6 billion.

The rise of organic foods are another example of heightened consumer interest in particular food attributes. Worldwide markets for organic foods are expanding, with annual growth rates of 15-30 percent in Europe, the United States, and Japan for more than 5 years. As many as 20-30 percent of consumers surveyed in Europe, North America, and Japan claim to purchase organic foods regularly. While there is interest in organic foods among higher income, better educated population segments in nearly every country, consumers in the United States, Europe, and Japan are driving the growing demand for these goods.

Consumer concerns regarding the environment and animal welfare have also led to changes in food production and marketing in some countries. Many developed countries have implemented new regulations, some of which, in response to animal welfare concerns, directly affect the raising of farm animals. These new regulations impose restrictions on the conditions under which livestock and dairy producers and processors may raise, feed, and slaughter animals.

Consumer demand for improved food quality has also led public and private sectors to develop and implement mandatory and voluntary quality control, management, and assurance schemes. These schemes are changing the way food products are produced, marketed, and traded in Europe, and, to some extent, the United States.

Quality assurance schemes develop standards for the production, processing, and transport of food and may include standards for environmental management practices. Western European countries employ certification systems that guarantee the traceability of fresh and processed meat back to the originating animal and farm, certification systems aimed at guaranteeing both product quality and environmental management of farms, and labeling and certification systems covering organic and natural production.

Unlike European programs, U.S. quality assurance programs tend to be limited in scope, focusing primarily on health standards and rarely considering animal welfare and environmental issues. U.S. programs also tend to be limited to on-farm quality assurance, rather than entire supply chain quality assurance. For example, the National Cattlemen's Beef Association's Beef Quality Assurance was introduced in 1982 to address concerns of chemical residues in beef.

Assurance schemes, whether voluntary or mandated by law, may increase production costs. For example, providing animals with larger spaces means that producers must either purchase additional land or keep fewer animals. This increase in resources per animal increases production costs, which, in turn, can result in higher prices for consumers.

Although many consumers may value the benefits added to society

by the new production processes and are willing to pay for these benefits, some consumers may prefer to purchase less-expensive foreign products. In general, any policy that imposes costs on a domestic firm rather than a foreign firm has the potential to put domestic firms at a disadvantage. Thus, when a country passes legislation that increases costs for domestic producers, the producers sometimes apply political pressure to block imports from countries that do not have similar regulations, even though such actions may contravene multilateral trade agreement commitments.

Future Prospects for Global Food Consumption and Trade

As food consumption reaches a state of maturity in developed countries, developing countries will be influential in shaping world agricultural trade. This trend is already evident in trade patterns for bulk commodities. Population and income growth will raise demand for food in developing countries. Limited resources may constrain food production in some developing countries. Unless agricultural productivity rises, developing countries will likely rely on imports to partly satisfy their food demands. What is less certain is how the composition of world trade will change. Developing countries will represent a larger share of the world market and will be the driving force behind trade in bulk grains. Growth in bulk trade, however, is unlikely to exceed growth in nonbulk trade.

Economic forces will continue to shape food consumption and trade patterns in developing countries. Meat consumption is likely to grow faster than food grain consumption. According to USDA projections, world wheat trade will grow only 1.4 percent over the next 10 years, while meat and coarse grain (used primarily for feed) imports will expand more than 2 percent per year.

Consumer concerns about food safety, the environment, and animal welfare issues will increasingly affect demand in many developed countries. Differences in food production and processing regulations and whether countries will recognize or accept the standards of their trading partners can create challenges in global food trade. Recognizing these potential challenges, countries are currently working toward multilaterally agreed-upon solutions. Consumer concerns for quality and multilateral rules governing quality issues are likely to play important roles in shaping future agricultural trade.

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