



Why Agricultural Trade Is (or Can Be) a Life-and-Death Matter

By Will Martin

July 2022

Key Points

- Nations engage in agricultural trade to reap the benefits of comparative advantage, providing quantity, quality, and diversity of foodstuffs for individual countries by giving access to products from widely different climate zones with varying availability of land, labor, and capital.
- Price volatility in international markets may dissuade some countries from participating in global food markets, but most shocks to agricultural production are localized and generate far more production, price variation, and food insecurity risks for an isolated nation than in global markets as a whole.
- When governments do insist on intervening in agricultural trade, those interventions should be simple and transparent, using price-related interventions such as tariffs and consumption taxes rather than quantitative restrictions such as import quotas and licenses.

Many arguments are offered against trade in agricultural products. Consuming only locally produced food is widely considered healthier, better for the environment, and generally desirable. It would undoubtedly be good to be able to rely on healthy, wholesome food produced by people we know and who depend on us directly for their incomes and way of life. However, there are also important reasons it makes sense not to rely solely on locally produced food and to reach out to other regions of the world for part of our food and nutrition.

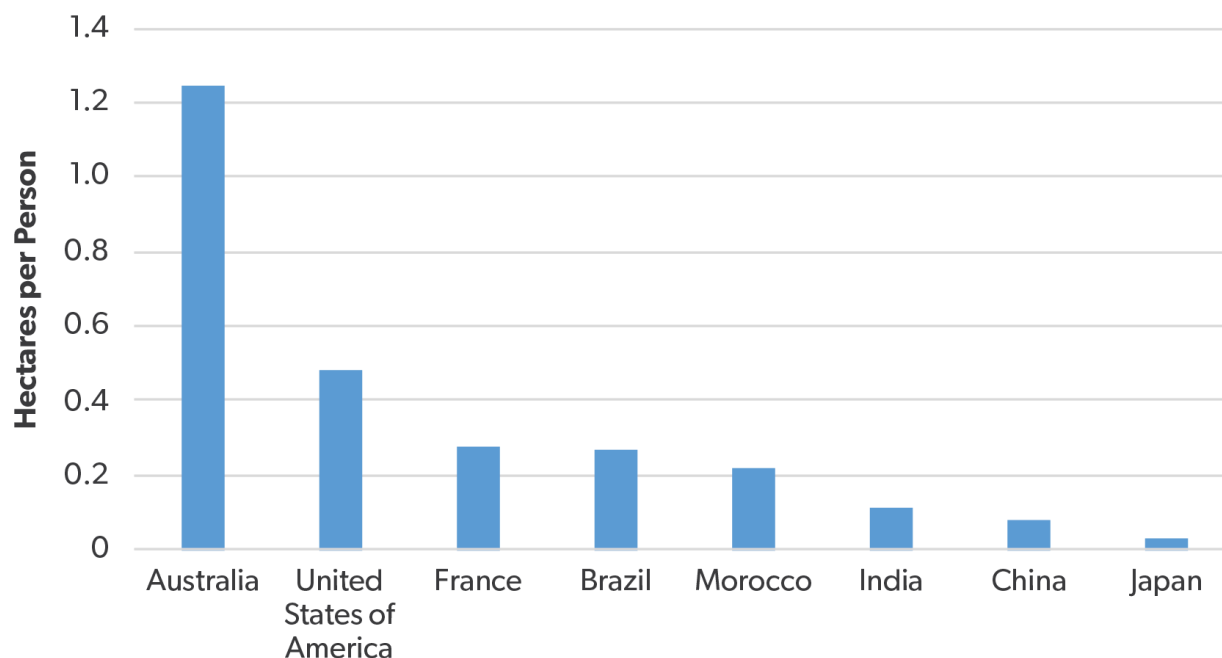
It makes sense to take advantage of the opportunities created by access to agricultural trade for three main reasons. The first is the ability of food trade to raise incomes. The second is food trade's important role in facilitating adjustments and population movements as economies grow. The

third is that trade can reduce income volatility and vulnerability to food insecurity.

Food trade's ability to sustainably raise a country's income is particularly important. The gains from trade in food arise because of the many ways in which economies differ. Countries vary enormously, for instance, in the amount of agricultural land per person that they have available. They also differ in the productivity of different sectors. The ability to access a wider range of agricultural products than a country or region can produce by itself generates additional gains.

Trade is also hugely important for facilitating economic growth. As individual incomes grow, patterns of food consumption change enormously. Very poor people consume little other than starchy staple foods. As incomes rise, people diversify their diets, adding more fruits and vegetables, vegetable

Figure 1. Arable Land Availability, 2018



Source: Author’s calculations using UN Food and Agriculture Organization, FAOSTAT, 2021.

oils, and livestock products. These changes are frequently difficult to accommodate if the economy relies entirely on domestically sourced food and particularly if people rely on only locally sourced food. Trade can allow changes in diets and facilitate the movement of labor out of low-productivity agriculture.

Many skeptics imply that agricultural trade is an unwanted and unnecessary source of volatility in prices and food security—a source of volatility that can be reduced simply by becoming self-sufficient in food. But this perspective gets the story completely backward. The volatility of agricultural output is almost always greater in an individual country than it is for the world as a whole. Seasonal weather and growing conditions vary enormously across countries—and within them. Agricultural trade can greatly reduce the volatility of output, prices, and food availability, relative to relying on solely locally produced food.

To the extent that governments intervene in agricultural markets, policies should be carefully designed to achieve their goals at the lowest possible cost. Simple, transparent, price-based measures such as tariffs have enormous benefits relative to costly and destabilizing measures such as quotas and export bans. It is also important to choose policies

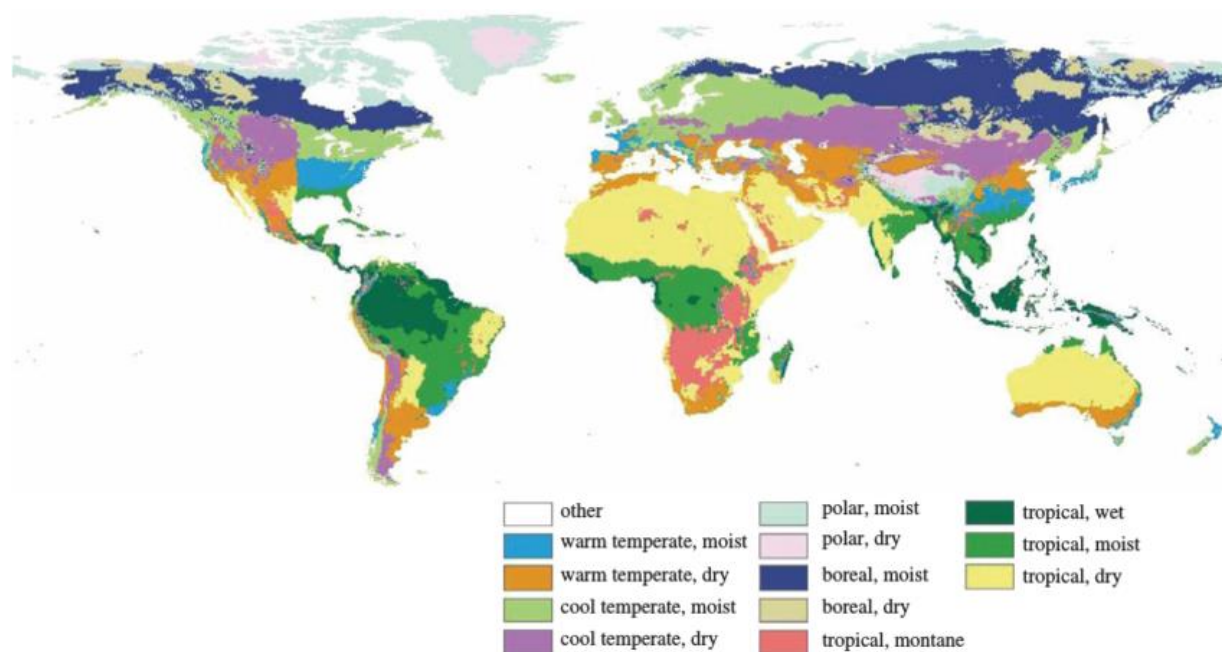
that most directly influence policy targets—choosing, for example, consumption taxes rather than import barriers when the goal is to reduce consumption of foods perceived to be unhealthy.

Agricultural Trade and National Income

If economies were all the same, then agricultural trade would provide little benefit. In reality, economies differ enormously in ways that make agricultural trade crucial. One major difference is in the amount of agricultural land per person that each country has available. UN Food and Agriculture Organization (FAO) statistics on the amount of arable land per person show a range from two hectares per person in Kazakhstan to one square meter per person in Singapore.¹ Figure 1 shows the contrasts for some key producing countries.

The enormous variation in the amount of land available is by itself an important reason for agricultural trade. If countries like Australia had to consume all their agricultural output, food prices would be excruciatingly low for farmers and incomes for the country as a whole substantially reduced. If Japan needed to rely on only home-produced food, prices for most if not all food products (for example, chicken, beef, and bread) would be

Figure 2. Differences in Types of Land Endowment



Source: Susan Tarka Sanchez et al., "Accounting for Indirect Land-Use Change in the Life Cycle Assessment of Biofuel Supply Chains," *Journal of the Royal Society Interface* 9, no. 7 (June 7, 2012): 1105–19, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3350742>.

excruciatingly high for consumers and national income unnecessarily low.

But it isn't only the amount of land that matters. The characteristics of that land are also enormously important. As shown in Figure 2, the type of land available for agriculture varies enormously among countries—particularly for smaller countries that may have all or most of their land within a single agroecological zone. Countries in, for example, the temperate, cool agroecological zone would have enormous difficulty producing important tropical crops such as coffee, tea, and bananas, just as the many countries located entirely in the warm tropics are likely to have great difficulty producing apples and wheat. Trade can greatly reduce the costs of these goods and help raise national income.

Where agriculture is labor-intensive, as in many developing countries, the availability of labor may have important implications for a country's trading position. But countries with limited amounts of labor relative to their land endowments—such as Argentina and Australia—may specialize in capital-intensive methods of production and become highly successful exporters of some agricultural products.

Another important difference among countries concerns the technologies they can bring to bear on

agricultural production relative to the technology they use in other sectors. This difference among countries was what led David Ricardo to first identify the theory of comparative advantage and explain why 17th-century Portugal would export wine to the United Kingdom in exchange for cloth, even if one of the two countries had lower labor productivity in both commodities. Clearly, the explanation in the UK-Portugal case also relies on differences in agroecological conditions of the type shown in Figure 2.

A more contemporary example of the importance of technology is the emergence of India as a large exporter of rice and wheat. Widespread adoption of new technologies developed in the Green Revolution has allowed India to become an exporter of these commodities despite the country's limited endowment of agricultural land, highlighted in Figure 1, and pricing policies that frequently result in farmers receiving prices well below world market levels.

Another important source of growth in real incomes and improved nutrition is access to a wider range of products. People, in general, prefer variety in their diets. This is particularly important with products such as fruits and vegetables,

which, without trade, may be completely unavailable or only available in narrow seasonal windows (perhaps only a couple of weeks a year). Access to a wider variety of fresh foods may also have important health and nutritional benefits.

Agricultural Trade and Growth

A central feature of the world's poorest countries is that a large share of their workers are tied up in low-productivity agriculture. If countries depend solely on their own agricultural production for food, it will be much harder for them to expand economic activity in other sectors, where productivity is generally much higher.

A key solution to this problem is to introduce higher-productivity approaches to agricultural production. This generally requires trade in seeds and intermediate inputs such as fertilizers. It is also important to expand exports of commodities for which the country has a comparative advantage and import products for which it does not. Many countries avoid importing large quantities of staple foods, but this can be costly and retards the process of structural transformation associated with economic growth—a process in which the share of agriculture in the economy declines sharply because farmers become much more productive.

As per capita incomes grow, patterns of demand for food change radically.

Agricultural trade is not just important for very poor economies. As per capita incomes grow, patterns of demand for food change radically. While very poor people consume mostly starchy staples, people with middle or high incomes include a larger share of animal-based products in their diets. Inefficiencies in the process of converting feeds such as coarse grains and proteins into animal-based foods such as milk and meat cause this dietary transformation to place much greater demands on the agricultural sector's productivity.

While poor countries can often be more or less self-sufficient with food, maintaining this

self-sufficiency when incomes rise is rarely possible. Countries, such as Japan and Korea, that have sought to do this have typically ended up importing livestock products indirectly, in the form of animal feeds such as maize and soybeans.

China has chosen to compensate for its limited resources of land and water by importing large quantities of soybeans and, increasingly, corn for livestock feed. Avoiding importing these commodities would have put strong upward pressures on living costs, depressing real incomes for workers.²

Agricultural Trade and Volatility

A common argument against agricultural trade is that world markets are volatile and hence leave countries that rely on agricultural trade vulnerable to wide fluctuations in food prices and food availability. There is some truth to this proposition, and this concern should be taken seriously. However, relying on only domestic production is typically a major source of vulnerability. The most important shocks to world markets come from weather-related shocks to yields, which are typically much larger for individual countries than for the world as a whole. Because yields are not closely linked across countries, poor yields in one region are likely to be offset by higher yields in others.

Wheat is an important example of a crop for which shocks to yields are greater at the country level than at the global level. Over the past 20 years, the standard deviation of global yields has been 9 percent, while the average standard deviation for an individual country has been 20 percent. This difference may not sound too large, but the costs of variability are linked to the squares of these deviations, making the cost of volatility at the national level five times as large as at the global level. The problem of volatile yields is much greater in semiarid countries with fickle growing conditions for wheat. In Chad and Morocco, for instance, the standard deviations of wheat yields were, respectively, 38 and 44 percent.³

The increase in vulnerability that comes from relying on local production is not an academic curiosity, but often a matter of life and death. A clear example of the potential benefits from trade comes from the introduction of railways in India during the 19th century. Before railways, transport

between regions of India—regions that are larger than many countries—had been prohibitively expensive. So region-specific famines were frequent and strongly linked to the absence of rainfall during the monsoon season. Once these regions were linked to the rail system and transport of food became possible, the incidence of famines fell because merchants could ship food into areas of need. The risk of famine was no longer linked so closely to local seasonal rainfall.

Another common argument about agricultural trade in countries with the resources to become exporters is that they should focus on achieving self-sufficiency but minimize their risk of exposure to world markets by avoiding becoming substantial exporters. Such a goal could be implemented by policies that lower domestic prices to the point at which domestic supply roughly matches domestic demand.

The underlying motivation for policies of this type may be to provide cheap food for urban consumers and avoid price shocks linked to changes in world prices. However, this policy creates a serious and unnecessary price volatility problem. When a country is an exporter, the price of grain at its border will equal the price on international markets less the cost of transport to those markets. When it is an importer, the price of grain will equal the world price plus the cost of transport. Transitioning from import to export status because of modest changes in crop yields for a country that is at the margin of self-sufficiency is therefore a potentially enormous source of price volatility.

Over the past 20 years, the average price of wheat has been just below \$200 per ton, and the cost of shipping a ton of grain to a developing country has averaged around \$70 per ton.⁴ The standard deviation of border prices⁵ in a country that spends half its time as an exporter and half its time as an importer is 37 percent. And this volatility is on top of any volatility in international grain prices, which itself is substantial.

Trade Policy

Once we recognize—as trade policymakers almost invariably do—that agricultural trade plays an important role, the key question becomes one of shaping policies to use trade to best achieve national

policy goals. From an economic efficiency perspective, the best policy is generally one of free trade. Tariffs, export taxes, and quantitative restrictions such as export bans all impose substantial economic costs.

But trade policy invariably involves political economy considerations. Some groups, such as farmers in rich countries and urban consumers in poor countries, are typically much better organized than others are. If the political pressures resulting from these differences in organizing strength are irresistible, then it is better to use price-based policies such as tariffs or export taxes than quantitative restrictions such as quotas or export bans.

Strong political pressures also arise to avoid sharp price increases in poor countries (to prevent urban unrest and political instability) and sustained periods of low prices in developed countries. (Farmers in developed countries like high prices and wield considerable political influence.) These pressures often result in the introduction of export bans during world price surges and sometimes in export subsidies from rich countries in periods of subdued prices.

A key problem with these measures is that they magnify—frequently sharply—the volatility of world prices. The magnitude of the current price surge in wheat associated with the collapse of exports from Ukraine, for instance, appears to have been massively magnified by policies such as export bans, variable levies, and import subsidies designed to shelter countries from the initial price increase.

As with policies designed to raise average prices in rich countries or lower them in poor countries, it is important to not use quantitative restrictions. These policies destabilize not only world prices but also domestic prices. If policies that seek to insulate domestic markets from world prices are to be used, they should seek to remove only part of the variation, rather than completely eliminate the effects of a change in world prices. That will greatly reduce the cost of implementing such a policy and its disruptive impacts on world prices.

One important error to avoid is using a trade policy measure when a better policy instrument is available. Commentators frequently advocate using trade policy, such as an import tariff, to deal with health concerns such as excessive consumption of a particular food, like sugar or fat. It is much better,

in such a situation, to use a policy measure that directly influences the problem at hand. An import duty on sugar, for example, encourages domestic production—and potentially creates a lobby group resisting taxes on sugar. A tax on sugar consumption, by contrast, directly affects the goal of reducing sugar consumption, without increasing incentives for sugar production.

In fact, facilitating agricultural trade stabilizes prices, expands nutrition options, and over the long

run increases productivity, economic activity, and economic growth in low-, middle-, and high-income countries. Therefore, policymakers should adopt policies that encourage trade in agriculture and other sectors of their countries' economies. If, for politically unavoidable reasons, they do intervene, they should only do so in ways that harm their citizens the least.

About the Author

Will Martin is a senior research fellow in the International Food Policy Research Institute's Markets, Trade, and Institutions Division. He is a former president of the International Association of Agricultural Economists.

Notes

1. UN Food and Agriculture Organization, FAOSTAT: Land Use, <https://www.fao.org/faostat/en/#data/RL>; and UN Food and Agriculture Organization, FAOSTAT: Annual Population, <http://www.fao.org/faostat/en/#data/OA>.
2. The English Corn Laws of the 18th and 19th centuries restricted trade in cereals while benefiting politically influential owners of large estates. This so obviously raised the cost of food for ordinary factory and other workers and lowered their real incomes so close to subsistence levels that eventually, at the urging of a Conservative prime minister (Sir Robert Peel) whose party relied on those landowners, restrictions on food imports were terminated in the mid-19th century.
3. Author's calculations using UN Food and Agriculture Organization, FAOSTAT: Crop and Livestock Products, February 17, 2022, <https://www.fao.org/faostat/en/#data/QCL>.
4. Average numbers are estimated by the author using maritime shipping cost data, as reported by Organisation for Economic Co-operation and Development, Maritime Transportation Cost, <https://stats.oecd.org/Index.aspx?DataSetCode=MTC>.
5. This is calculated using logarithms of prices so that the measure has the interpretation as a proportional deviation from the mean.

© 2022 by the American Enterprise Institute for Public Policy Research. All rights reserved.

The American Enterprise Institute (AEI) is a nonpartisan, nonprofit, 501(c)(3) educational organization and does not take institutional positions on any issues. The views expressed here are those of the author(s).