United States
International Trade Commission

Rice: Global Competitiveness and Impacts on Trade and the U.S. Industry

March 2025
Publication Number: 5600
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International Trade Commission

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Abbreviations and Acronyms

Term	Definition
ACA	Asociación Cultivadores de Arroz [Rice Growers Association] (Uruguay)
ADB	Asian Development Bank
AMIS	Agriculture Information Management System
AMS	aggregate measurement of support
APEDA	Agricultural and Processed Food Products Export Development Authority (government of India)
API	Agriculture Policy Institute (government of Pakistan)
APMC	Agricultural Produce Market Committee (government of India)
APTERR	ASEAN Plus Three Emergency Rice Reserve
ARC	Agriculture Risk Coverage (U.S. Department of Agriculture)
ARSA	Asian Rural Sociology Association
ASEAN	Association of Southeast Asian Nations
AUV	average unit value
AWD	alternate wetting and drying
BAIDP	Bangladesh Agricultural Infrastructure Development Program
BBC	British Broadcasting Corporation
BBS	Bangladesh Bureau of Statistics
BIS	Bank for International Settlements
BPNT	Non-Cash Food Assistance (government of Indonesia)
BRRI	Bangladesh Rice Research Institute
CACP	Commission for Agricultural Costs and Prices (government of India)
CAFTA-DR	Central America-Dominican Republic Free Trade Agreement
CAPARROZ	Paraguayan Chamber of Rice Industries
CCC	Commodity Credit Corporation (U.S. Department of Agriculture)
Census	U.S. Census Bureau
CIAT	International Center for Tropical Agriculture
CIPS	Center for Indonesian Policy Studies
CNA	Brazilian Confederation of Agriculture and Livestock
COFCO	China Oil and Foodstuffs Corporation
Commission	U.S. International Trade Commission
CONAB	Companhia Nacional de Abastecimento [National Food Supply Company] (government of Brazil, Ministry of Agriculture)
COVID-19	coronavirus disease 2019, caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)
CPEC	China-Pakistan Economic Corridor
CPTPP	Comprehensive and Progressive Agreement for Trans-Pacific Partnership
CSQ	country-specific quota
CV	coefficient of variation
USITC DataWeb/Census	U.S. International Trade Commission Interactive Tariff and Trade DataWeb/U.S. Census Bureau
DFPD	Department of Food and Public Distribution (government of India)
DGFT	Director General of Foreign Trade (government of India)
DOF	Diario Oficial de la Federación [Official Gazette of the Federation] (government of Mexico)
EBA	Everything but Arms
EC	European Commission
EMBRAPA	Brazilian Agricultural Research Corporation
ERS	Economic Research Service (U.S. Department of Agriculture)

Term	Definition
ESD	Economics and Statistics Division (government of India, Ministry of Agriculture and Farmers Welfare)
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FAS	Foreign Agricultural Service (USDA)
FCI	Food Corporation of India
FFTC	Food and Fertilizer Technology Center for the Asian and Pacific Region
FMD	Foreign Market Development
FPMA	Food Price Monitoring and Analysis
FPO	farmer producer organization
FSA	Farm Service Agency (USDA)
GDP	gross domestic product
GFAiR	Global Forum on Agricultural Research and Innovation
GI	geographical indication
GMA	Gremial de Molinos Arroceros [Rice Millers' Association] (Uruguay)
GTA	Global Trade Atlas
GTAS	Global Trade Analytics Suite
ha	hectare
Harmonized System or HS	*Harmonized Commodity Description and Coding System*
IBEF	India Brand Equity Foundation
IGC	International Grains Council
IIP	Irrigation Improvement Program (government of Indonesia)
IMF	International Monetary Fund
IMO	International Maritime Organization (UN)
INIA	Instituto Nacional de Investigación Agropecuaria [National Agricultural Research Institute] (Uruguay)
IRGA	O Instituto Rio Grandense do Arroz [Rio Grande do Sul Rice Institute] (government of theState of Rio Grande do Sul, Brazil)
IRRI	International Rice Research Institute
ITA	International Trade Administration (U.S. Department of Commerce)
Jones Act	U.S. Jones Shipping Act of 1920; section 27 of the Merchant Marine Act of 1920 (Pub. L. No. 66-261)
kcal	kilocalories
kg	kilogram
LPI	Logistics Performance Index (World Bank)
MA	Minimum Access (government of Japan)
MAFF	Ministry of Agriculture, Forestry and Fisheries (government of Japan)
MAFW	Ministry of Agriculture and Farmers Welfare (government of India)
MAG	Ministry of Agriculture and Livestock (government of Paraguay)
MAP	Market Access Program (U.S. Department of Agriculture)
MCI	Ministry of Commerce and Industry (government of India)
MEP	minimum export price
MERCOSUR	Mercado Común del Sur (Southern Common Market)
MFN	most-favored nation
mmbtu	metric million British thermal units
MMT	million metric tons
MNFSR	Ministry of National Food Security and Research (government of Pakistan)
MoF	Ministry of Finance (government of Pakistan)
MPS	market price support
MSP	minimum support price

Term	Definition
mt	metric tons
MY	marketing year(s)
NAFTA	North American Free Trade Agreement
NASS	National Agricultural Statistical Service (U.S. Department of Agriculture)
NDRC	National Development and Reform Commission (government of China)
NFSA	National Food Security Act (government of India)
NFSM	National Food Security Mission (government of India)
NRDC	Natural Resources Defense Council (U.S. nonprofit)
OAS	Organization of American States
OECD	Organisation for Economic Co-operation and Development
OMA	Ordinary Market Access (government of Japan)
PACIC	Paquete contra la inflación la carestía [The Package Against Inflation and Expenditure] (government of Mexico)
PDS	Public Distribution System (government of India and government of Iraq)
PE	partial equilibrium
PEP	Program for Product Flow (government of Brazil)
PEPRO	Equalizing Premium Paid to Rural Producers (government of Brazil)
PERI	Punjab Economic Research Institute (India)
PFDS	Public Food Distribution System (government of Bangladesh)
PGI	protected geographical indication
PIB	Press Information Bureau (government of India)
PLC	Price Loss Coverage (USDA)
PRRI	Philippine Rice Research Institute
PSD	Production, Supply and Distribution (USDA)
PSE	Producer Support Estimate (OECD)
PSH	public stockholding
RAPP	Regional Agricultural Promotion Program (USDA)
REAP	Rice Exporters Association of Pakistan
RECP	Rice Export Corporation of Pakistan
RMB	Chinese renminbi (currency)
SAGR	State Administration of Grain and Reserves (government of China)
SBS	simultaneous buy and sell (government of Japan)
SEGALMEX	Seguridad Alimentaria Mexicana [Food Security Agency] (government of Mexico)
SICE	Foreign Trade Information System (Organization of American States)
SID	Statistics and Information Division (government of Bangladesh, Bureau of Statistics)
Sinograin	China Grain Reserves Group Ltd. Company
SOE	state-owned enterprise
SPS	sanitary and phytosanitary
SSA	sub-Saharan Africa
STE	state trading enterprise
TPDS	Targeted Public Distribution System (government of India)
TRAINS	Trade Analysis Information System (United Nations)
TRIPS	Trade-Related Aspects of Intellectual Property Rights (WTO agreement)
TRQ	tariff-rate quota
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
USA Rice	USA Rice Federation
USAID	U.S. Agency for International Development
USD	U.S. dollar
USDA	U.S. Department of Agriculture
USITC	U.S. International Trade Commission

Term	Definition
USMCA	United States-Mexico-Canada Agreement
USPTO	U.S. Patent and Trademark Office
USRPA	U.S. Rice Producers Association
USTR	Office of the U.S. Trade Representative
VND	Vietnamese dong (currency)
WFP	World Food Programme (United Nations)
WIPO	World Intellectual Property Organization
WITS	World Integrated Trade Solution
WTO	World Trade Organization

Executive Summary

In a letter dated February 5, 2024, the House Committee on Ways and Means (Committee) asked the U.S. International Trade Commission (USITC or Commission) to investigate and produce a report that examines the global competitiveness of the U.S. rice industry. As requested by the letter, this report updates a similar 2015 Commission report on the rice industry. The Committee requested updates on recent developments in the rice industries of the United States and other major global producing and exporting countries, including Bangladesh, Brazil, China, India, Indonesia, Pakistan, Paraguay, Thailand, Uruguay, and Vietnam; information on recent trade in the global market for rice; a comparison of competitive strengths and weaknesses of the rice industry in the United States and other major exporting countries; a qualitative and quantitative assessment of the impact of government policies on the U.S. rice industry and food security; and an overview of the impact of exports from the aforementioned countries on the U.S. rice industry in the United States and export markets.

Scope and Approach

This report covers the rice industries in the United States and other major rice-producing and -exporting countries between 2018 and 2023. The Commission prepared its report using data and information from numerous sources, including trade and production data; relevant literature and reports; and interviews with officials representing industries, governments, academia, international organizations, nongovernmental organizations, and other sources. The Commission held a public hearing on April 30, 2024, and solicited comments from the public. Commission staff also conducted fieldwork in India, Thailand, Vietnam, Arkansas, California, and Louisiana.

This report uses both *Harmonized Commodity Description and Coding System* (HS) and industry classifications when discussing rice production, consumption, and trade. Rice is classified under the HS 4-digit heading 1006. Rice is further classified at the 6-digit level as rice in the husk (paddy or rough), brown rice, semi- or wholly milled rice, and broken rice. Some countries, including the United States, have additional tariff classifications for parboiled rice, which is prepared by placing milled rice in hot water and heating it further (generally by steaming), then drying it again. The rice industry further classifies rice by grain length (long, medium, and short), by quality (e.g., grade), and by variety. Industry terms to describe rice by variety include differentiation of the two main subspecies groups, indica (typically long grain varieties) and japonica (typically medium and short grain varieties), as well as of rice varieties cultivated for special characteristics such as aromatic and glutinous rice. Most aromatic rice—including the two most common aromatic varieties, jasmine and basmati—is long grain rice. In keeping with common practice in the industry, this report treats aromatic rice separately because of its unique qualities and the price premiums it commands.

Main Findings

A Small Share of Rice Production Is Traded Internationally

Although rice is one of the most widely planted crops, less than 10 percent of global rice production was traded between 2018 and 2023. Some countries contributed a small share of global production but a larger share of global exports. For example, the United States accounted for 1 percent of global production but accounted for 5 percent of global exports. Conversely, some countries produced a much larger global share of rice than they export. China, for example, contributed 29 percent of global production but only accounted for 4 percent of global exports (table ES.1). Rice exports were generally concentrated among a small number of countries, and imports were much more diversified. India accounted for the largest single-country share of global exports. The largest exporting region was Southeast Asia, led by exports from Thailand and Vietnam. The largest importing region was West Africa. The largest single-country importers included China, Indonesia, and the Philippines. Most of the rice traded globally was milled, long grain rice.

Table ES.1 Shares of global production, exports, and imports for major producers and exporters, averages across marketing years 2018/19–2023/24
In percent, by marketing year.

Country	Share of global production (%)	Share of global exports (%)	Share of global imports (%)
China	28.9	4.2	7.3
India	24.9	32.2	0.0
Bangladesh	7.0	0.0	1.5
Indonesia	6.7	0.0	3.4
Vietnam	5.3	14.0	4.4
Thailand	3.8	14.8	0.3
Pakistan	1.6	8.8	0.0
Brazil	1.4	2.1	1.8
United States	1.3	5.4	2.4
Uruguay	0.2	1.7	0.0
Paraguay	0.2	1.5	0.0
All others	18.7	15.3	79.0
Total	100.0	100.0	100.0

Source: USDA, FAS, PSD Online database, accessed January 2, 2025.

Many Governments Intervened in the Rice Industry to Promote Domestic Production and Food Security

Government intervention in rice production and trade is common because of the role rice plays in food security in many countries.[1] Rice is a primary staple food for more than half the world's population,

[1] According to the U.S. Department of Agriculture (USDA), Economic Research Service (ERS), food security involves many dimensions, including food availability, access, usage, and stability. This report adopts a measure of food security from the USDA ERS: the food gap. The food or calorie gap describes the shortfall between a nutritional target of 2,100 kilocalories (Kcal) per day and estimates of per capita food available.

primarily in Africa and Asia, where it is economically and culturally significant. Thus, many governments consider self-sufficient rice production critical to food security. Policies to promote self-sufficient rice production include limiting rice trade, supporting producer prices, offering input subsidies, and managing public stocks. Some countries offset producer support with consumer subsidies. Although producer support policies may encourage domestic production, they often come with unintended consequences. For example, input subsidies can lead to overuse of water and agrochemicals, which can have environmental costs like soil and groundwater depletion. Additionally, the goal of self-sufficiency sometimes conflicts with the goal of lowering consumer prices for rice, which would often be consistent with reducing barriers to imports or releasing public stocks in the domestic market.

The Commission's economic modeling simulations estimate the effects of government policies on food security. For example, the Commission's simulations show that removing India's export ban would reduce food security in India because some rice would be exported instead of supplying the domestic market. The same simulations show that the removal of India's export ban would improve Vietnam's food security, because some of Vietnam's rice exports would be diverted to its domestic market after India's exporters reenter Vietnam's market. Similarly, simulated export charges on Thai rice would improve food security in Thailand but reduce food security in major importing countries.

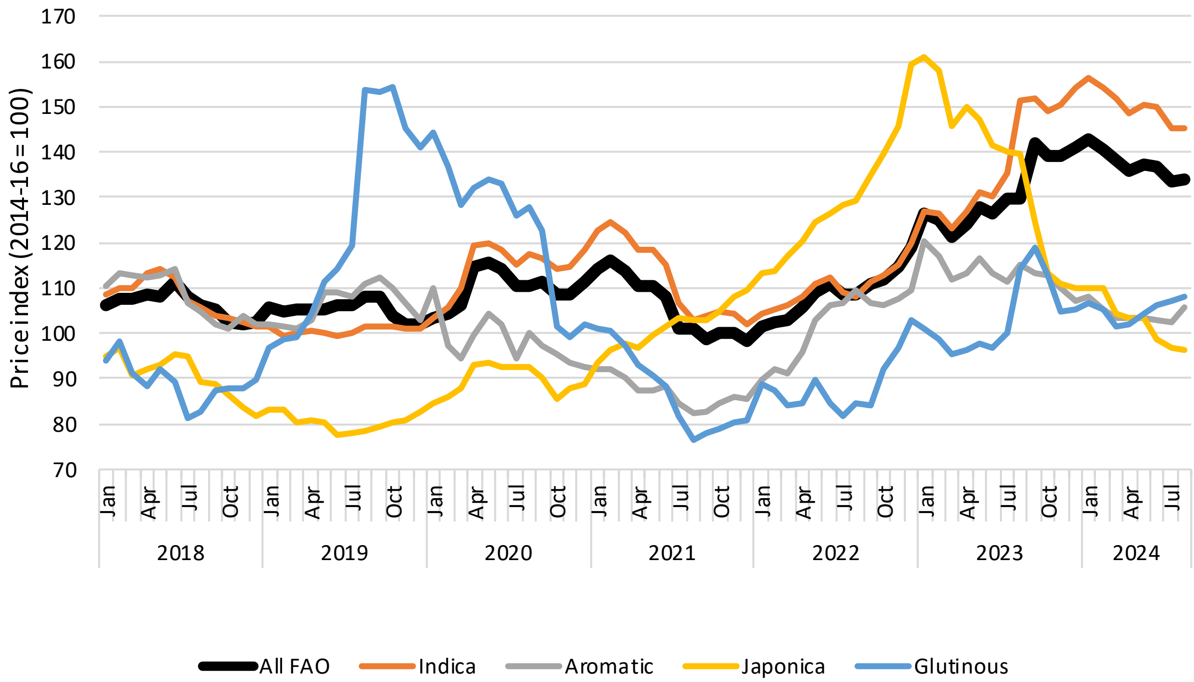
The Commission's economic modeling simulations also show that the liberalization of imports would have a positive effect on food security in certain net importing countries by increasing rice imports and overall supply available for consumption in these countries and decreasing the average calorie gap. However, the same simulations show that consumer prices would rise slightly for certain net exporting countries because rice originally destined for the domestic market would be exported, thus reducing the exporting country's available supply and food security. For example, expanding Vietnam's exports would have a small, adverse effect on food security in Vietnam because less rice would be available in Vietnam's domestic market.

Major Fluctuations in Global Rice Prices Occurred Between 2018 and 2023

Between 2018 and 2023, global events inside and outside the rice sector caused sharp changes in rice prices. Prices were volatile during this period for several reasons, including disruptions to rice availability on the global market, government intervention in major producing and consuming countries, and exchange rate fluctuations (figure ES.1). In 2020, the COVID-19 pandemic caused rice prices to spike because of temporary export restrictions and stockpiling, as well as shipment and logistics disruptions. Prices fell in 2021 in response to lower demand, currency movements, and weather patterns that year but rose in 2022 and 2023 as demand increased. Export restrictions in India in 2022 and 2023 also caused global rice price volatility, most notably in 2023 following India's ban on exports of non-basmati rice.

Figure ES.1 FAO rice price indexes, 2018–24

Price index (2014–16) = 100. Underlying data for this figure can be found in appendix F, table F.1.



Source: FAO, "FAO Rice Price Update," accessed September 5, 2024.

Note: The All-FAO Rice Price Index is based on 21 rice export price quotations.

Rice production costs and shipping costs also fluctuated between 2018 and 2023 because of global disruptions that affected many industries, which, in turn, affected rice prices. The COVID-19 pandemic and the Russian invasion of Ukraine caused large swings in fertilizer and energy prices and disrupted key shipping routes. These disruptions increased production costs and prompted nonfarm costs, such as transport for bulk shipments, to fluctuate. These cost fluctuations contributed to volatile rice prices between 2018 and 2023.

Climate- and Weather-Related Disruptions Have Strong Effects on Rice Production

Between 2018 and 2023, global rice production fluctuated because of temperature swings, droughts, and floods. Generally, rice is cultivated in low-lying areas that have poor drainage and are prone to flooding, often near coastlines or major waterways. Although these areas are well suited for rice production, they are particularly exposed to the effects of weather-related disasters and longer-term changes in the climate that increase the frequency of such disasters. In addition, much of the world's rice production is rainfed and highly dependent on monsoons and other seasonal rains. Therefore, extreme weather events can have large effects on the global rice supply. For example, in 2022, delayed monsoons and high heat in India led to delayed planting and a 13 percent reduction in the area under rice production. In areas where rice production is irrigated, production was more stable, although droughts have stressed water supply and subsequently raised irrigation costs. Rising sea levels have caused saltwater intrusion in Bangladesh, Vietnam, and other major producing countries.

Floods, erratic rainfall, extreme weather events, and saltwater intrusion are expected to worsen in the future because of climate change, leading some rice-producing countries to focus on adaptation strategies. The public and private sectors in many producing countries have mobilized to develop rice varieties and implement production practices that are more tolerant of climate-related stress. For example, researchers in Vietnam are developing saltwater-tolerant rice varieties, and some Indian states are encouraging planting methods that use less water. In other areas, however, rice production has been abandoned altogether in favor of more climate-tolerant crops, such as fruit trees and aquaculture.

Production Costs Vary Widely Among Major Rice-Producing Countries

Differences in production costs across countries affect the competitiveness of major rice producers. Generally, India, Pakistan, and Vietnam have some of the lowest production costs; the United States, Brazil, China, and Indonesia have some of the highest. Major producers with low production costs can offer lower prices, which makes their exports more competitive. Producers with high production costs often cannot compete in price-sensitive markets absent other advantages such as product differentiation or tariff preferences.

Farm size also affects the cost structure and productivity of rice producers. In South Asia and Southeast Asia, rice farms are smaller and more labor intensive than in other regions. These small farms lack the economies of scale to justify capital investments, which limits their degree of mechanization and, by extension, their productivity. Despite some efforts to overcome scale challenges, such as equipment rental services, yields tend to be lower on small farms in areas where rice is traditionally grown.

In the United States and South America, farms are larger and more capital intensive. In these regions, wages are higher than in South Asia and Southeast Asia, but the labor share of production costs is low because of the widespread use of machinery and more efficient farming practices. The widespread use of mechanization, efficient production practices, and advanced production technology in these regions increase rice yields. Higher yields across large farms lower per-unit production costs.

Rice Consumption Patterns Are Changing

World rice consumption has been rising as a result of population growth in Africa and Asia (table ES.2). Despite aggregate consumption growth, per capita consumption is on the decline. In Asia, per capita rice consumption has been declining because of rising incomes and urbanization, which are causing consumers to shift their diets away from rice and toward proteins and wheat-based products. At the same time, in many high-income markets such as the United States, higher-value aromatic rice has been rising as a share of overall rice consumption. Immigration, changes in consumer tastes, and income growth are driving this shift in high-income markets.

Table ES.2 Global rice consumption, by region, for marketing years 2018/19–2023/24
In millions of metric tons, by marketing year.

Region	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
South Asia	145.7	149.3	149.8	159.2	163.9	166.2
East Asia	158.9	161.0	165.4	171.4	169.9	163.4
Southeast Asia	102.9	103.7	104.1	104.7	106.1	106.8
Sub-Saharan Africa	33.6	33.9	34.5	36.2	38.2	38.0
South America	14.9	14.7	15.0	14.9	14.8	15.1
Middle East	9.2	9.4	9.2	9.6	9.8	10.2
North America	5.9	6.0	6.2	6.2	6.0	6.4
North Africa	4.6	4.6	4.6	4.4	4.3	4.6
European Union	3.2	3.4	3.4	3.5	3.3	3.3
All other	6.1	6.1	6.1	6.1	6.1	6.2
Total	485.1	492.1	498.4	516.2	522.4	520.2

Source: USDA, FAS, PSD Online database, accessed December 28, 2024.

Increased consumption of aromatic rice has led to growing exports of basmati rice from India and jasmine rice from Thailand. Producers in Pakistan and Vietnam have also expanded their production of aromatic rice varieties in response to this trend, although these countries are less established as aromatic rice producers. Because aromatic rice generally commands higher prices than nonaromatic varieties, the expansion of aromatic rice production has the potential to raise producers' income. Aromatic rice production, however, generally has lower yields, which limits the ability of high-cost producers to profitably grow aromatic rice.

Other Countries' Import Policies Can Impact the Export Competitiveness of the U.S. Rice Industry

Tariff-free access to certain U.S. export markets supports the competitiveness of U.S. rice. For example, U.S. rice exporters have tariff-free access to Mexico—the largest U.S. rice export market—through the U.S.-Mexico-Canada Agreement (USMCA), and prior to that the North American Free Trade Agreement. The value of these tariff preferences can erode if rice imports from other countries begin to receive similar tariff preferences to U.S. rice. This happened in some Western Hemisphere markets during 2018–23. For example, in Mexico, unilateral elimination of tariffs on imports from other sources caused the United States to lose some of its market share, primarily to Brazil. In East Asia, U.S. market access is subject to import regimes like tariff-rate quotas (TRQs) and country-specific quota allocations whose administration can affect U.S. competitiveness in these markets vis-à-vis other import suppliers.

According to the Commission's economic modeling simulations, greater market access would increase U.S. rice exports. Simulations show that the removal of all import tariffs would have a net positive effect on U.S. rice production and exports and would cause U.S. exports to rise more than 40 percent from their baseline level in 2023. The Commission's economic modeling simulations of unilateral policies also show potential gains to U.S. rice exports from greater market access. Of the four unilateral policies modeled, an increase in Japan's TRQ for rice imports would cause the largest increase in U.S. rice exports. With a higher in-quota volume of imports under the TRQ, average revenue and profit for the U.S. rice industry would increase slightly. Gains would likely be higher for California's rice industry, which is the only region of the United States that exports to Japan.

Country-Specific Findings

United States

The United States accounts for approximately 1 percent of global rice production but approximately 5 percent of exports, owing to limited domestic consumption. Rice production in the United States can be broadly grouped into two regions: the South and California. The South contributes over 80 percent of rice production, mainly long grain rice. Most of California's production is of higher value medium grain and short grain rice. Although production practices differ between regions, production across the country occurs on large, advanced, irrigated farms. U.S. government support for the rice industry is limited and consists of support programs that provide farmers with risk management tools to mitigate losses during periods of low yields or low prices, natural resources conservation, export promotion, and purchases that make up international food aid.

Paddy rice was the largest category of U.S. rice exports during 2018–23, accounting for 43 percent of total exports by volume. Most of those exports go to Mexico and Central America. White long grain rice and white medium grain rice totaled 24 percent and 18 percent of exports, respectively, during this period. The top export markets for U.S. white long grain rice over this period were Haiti, Iraq, Canada, Mexico, and the Dominican Republic; the top export markets for U.S. white medium grain rice were Japan, Jordan, Canada, South Korea, and Taiwan. The United States is a reliable supplier of these rice types, both domestically and abroad, owing to its high-yield production systems. Although the United States supplies most of those rice types for its own consumption, it has been largely unable to compete with imports of aromatic varieties. The latter represent a growing segment of the domestic market because their distinct aroma and flavor are increasingly popular with consumers.

Even with high yields, however, growers in the United States face relatively high costs of production for their rice cultivation. Due to higher production costs, the U.S. rice industry focuses efforts on certain export markets where it is better able to compete. In these export markets, U.S. competitiveness is strengthened by efficient transportation logistics that offer consistent, timely delivery and offset higher production costs. Additionally, tariff preferences in key markets in Latin America improved the price competitiveness of U.S. exports. Some of these advantages, however, have eroded in recent years as similar tariff preferences were extended to competing producers. Compounding the challenge for U.S. exporters, some of these same Latin American markets also have raised concerns regarding certain quality attributes of U.S. rice.

South Asia

India

India is a high-volume producer and exporter of basmati and non-basmati rice varieties to the global market. In 2023, it was the second largest global producer of rice after China, making up 26 percent of global production. In marketing year 2023/24, non-basmati white rice was an estimated 93 percent of total Indian production of rice; basmati rice made up the remaining 7 percent. While basmati rice was a small share of Indian rice production, it accounted for a much higher share of its exports because it is in high demand in global markets. India's government supports rice producers with a substantial and complex set of policy interventions, consisting of public stocks and minimum support prices, input subsidies, export restrictions, and high import tariffs.

India is by far the world's largest exporter of rice, serving many diverse markets, and its importance as an exporter rose during 2018–23. From 2019 to 2022, India's rice exports more than doubled from 9.9 million mt to 22.2 million mt. Since 2020, India's increased production and weakened currency resulted in highly competitive export prices for its rice relative to other rice producers. The increased exports were mainly of parboiled, long grain white, and broken rice; basmati and other rice exports remained relatively steady by comparison. Starting in 2022 and continuing through 2024, the Indian government's imposition of export duties and bans on exports of certain rice types and forms caused overall export quantities to decline. From 2022 to 2023, total exports of rice from India dropped by about 20 percent; export declines for banned products continued into 2024.

Rice from India is highly competitive on the global market. Nonaromatic rice from India competes largely on price, partly attributable to government support via input subsidies, which lower delivered cost, and a minimum support price that incentivizes rice production and increases supply. India has also developed a niche market for basmati rice, which allows it to supply a differentiated product to higher-priced markets. However, production, particularly in states that grow basmati rice, is challenged by climate-related disruption.

Pakistan

Pakistan is a steady producer and reliable exporter of non-basmati and aromatic basmati rice. Rice farming is important to Pakistan's economy, and rice is the country's top agricultural export and second-largest overall export. In general, Pakistan's rice farms have low levels of mechanization and are rainfed. In addition, only a small portion of rice farmers in Pakistan reported use of improved planting and harvesting techniques. However, yields have increased in Pakistan because of increased adoption of high yield hybrid non-basmati varieties.

Pakistan was the world's fourth-largest exporter in 2023 and supplied an average of about 9 percent of world rice exports by volume each year during 2018–23. Top export destinations in 2018–23 included China, Afghanistan, Malaysia, and Kenya. Pakistan also gained market share in Haiti, largely at the expense of U.S. exporters. Basmati exports from Pakistan were sent mostly to the Middle East and the European Union.

Pakistan's position as a major global exporter of rice during 2018–23 was supported by its low delivered cost, product differentiation, and reliability of supply. Pakistan was among the relatively low-cost producers, along with India and Vietnam. Production costs for all types of rice from Pakistan were aided by government programs for agriculture, and rice prices were made more attractive by exchange rate effects. However, infrastructure issues, port delays, and freight costs increased export prices. Pakistan also benefits from being one of just two global suppliers of basmati, a premium product that is naturally differentiated from other types of rice. Pakistan increased basmati exports to the United States between 2018 and 2023, but Pakistan's exports of branded basmati products were minimal. For all rice, Pakistan's export reliability was strong because the country's production volume was high and domestic consumption was low.

Bangladesh

Rice is important to Bangladesh's economy, contributing almost three-quarters of the total agricultural GDP, and Bangladesh's government considers rice vital to food security. Bangladesh produces both aromatic and nonaromatic rice. Rice production in Bangladesh generally takes place on small family farms and is an important source of rural income. On rice farms, mechanization is low; inputs are used inefficiently; and difficult growing conditions limit the productivity of rice farms. Despite these challenges, Bangladesh is the third-largest rice producer in the world. Bangladesh is almost entirely self-sufficient in rice production but occasionally imports white and aromatic rice when necessary to cover production shortfalls. The Bangladeshi government is highly engaged in the domestic rice industry, and food security through self-sufficiency in rice is a main driver influencing government policies. The government of Bangladesh also uses trade policies to further support the rice industry and provide domestic market stability.

Bangladesh exports relatively small volumes of rice. The country's rice exports are less than 1 percent of world rice exports and are of primarily seed, aromatic rice, and specialty varieties destined for diaspora populations in the United States, Canada, and European countries. Bangladesh is a net importer of rice; but imports were erratic between 2018 and 2023, with the Bangladeshi government and private firms importing to cover domestic production shortfalls.

Factors limiting export potential include climate-related events that disrupt production, limited farm productivity, and poor infrastructure and weaknesses in the supply chain. Bangladesh is strongly impacted by extreme weather changes that can disrupt production and increase saltwater intrusion. The lack of arable land available to convert to rice production has limited production and exports while small farm size hinders economies of scale. In addition to production-related constraints, the rice industry in Bangladesh faces difficulties getting the product to market. Poor road and port infrastructure and inadequate storage facilities lead to losses in transit.

East Asia and Southeast Asia

Vietnam

Vietnam is a major global producer of rice and the third-largest exporter in the world. Vietnam produces several rice types, including long grain rice, small volumes of glutinous rice, and a rising share of premium and aromatic rice varieties. Between marketing years 2018/19 and 2023/24, Vietnam accounted for a consistent 5 percent of global rice production annually. Rice is widely grown throughout Vietnam, the primary growing regions being the Mekong River Delta in the south and the Red River Delta in the north. Rice production in the Mekong River Delta is export oriented, accounting for 90 percent of the country's rice exports while comprising just over 50 percent of production. Farm sizes in Vietnam are relatively small, but the average farm size in the Mekong River Delta is larger than in the Red River Delta. Despite small farm sizes, Vietnam's yields are consistently about double the global average, stemming from ideal agronomic conditions, high rates of irrigation, some mechanization, and strong research and extension systems. However, obstacles in the off-farm value chain remain a lingering constraint on rice production, and environmental challenges are threatening and increasingly impacting rice production in

Vietnam. Overall, government support in Vietnam is market oriented, focused on supporting the rice sector with investment in public infrastructure and research and technical assistance.

Vietnam, the third-largest exporter of rice behind Thailand and India, exports about 30 percent of its production. The primary destinations for Vietnamese rice exports are other Asian countries, with the Philippines, China, Malaysia, and Indonesia accounting for 70 percent of total exports in 2022. Reportedly, the majority of exports to the Philippines and Indonesia are done through government-to-government contracts, and it is estimated that just under half of all rice exports are through state-owned firms. Vietnam is a small importer, primarily from Cambodia and India. Vietnam's imports from Cambodia are of paddy rice for milling, and Vietnamese firms use this rice to complement their export offerings of milled rice.

Vietnam is a reliable, cost-competitive exporter of rice in both low-value commodity and premium market segments. This competitiveness is driven by the country's ability to take advantage of the prime growing conditions and natural resources to produce multiple crops of rice a year, as well as government policies that have increased productivity. These policies help the sector address challenges, including managing rising input costs, adapting to saltwater intrusion, and reducing the carbon emissions from rice production. However, the lack of investment in the off-farm value chain—driven by small firms, low margins, and lack of financing—increases losses. In addition, limited linkages between Vietnamese exporters and businesses in higher-value export markets, combined with an undeveloped reputation for premium rice, further constrain Vietnam's competitiveness.

Thailand

Thailand produces a variety of rice types, including long grain white rice, parboiled long grain white rice, aromatic jasmine rice, and glutinous rice. Aromatic rice made up 35 percent of production, and within this total, the largest share was of Hom Mali, a premium variety of jasmine rice with its own standard of identity that is predominately grown in Northeastern Thailand. Because Hom Mali commands higher farmgate and export prices than other jasmine and white rice varieties, producers in the Northeast often have higher returns and can mitigate the risk of higher input prices, even with lower rates of mechanization. Like other Southeast Asian producers, rice farm size across Thailand averages less than 3 hectares. Overall, rice farming has shown no signs of transitioning to larger, more efficient landholdings. While mechanization rates in land preparation, rice planting, and harvesting have increased since 2000, labor remains the primary input cost associated with rice farming in Thailand. Since abandoning the 2011–14 Paddy Pledging Program, the Thai government has favored less disruptive policies to assist rice farmers. Now, government policies emphasize supporting producer income.

Of the world's top 10 rice producers, Thailand exports the highest share of its production, at 38 percent. Thailand supplies a geographically diverse array of markets that demand different varieties of rice, with Indonesia, South Africa, Iraq, the United States, and China being its top five export destinations in 2023. Thailand's rice trade is segmented by the variety being traded.

The relative competitiveness of Thailand's rice industry depends on the variety of rice grown. Thailand is the primary supplier of high-value jasmine rice, and this market segment supports both export sales to high-income markets and revenues for Thailand's rice industry. Although Thai exporters can supply diverse markets with different types of rice, they face cost pressures in the long grain white and broken rice markets. Both of these rice markets are more commoditized and do not benefit from product differentiation. In these segments, delivered cost has the most impact on importer demand. Consequently, producers of long grain white rice face greater pressures from input costs than jasmine rice growers. Furthermore, the investments made in Thailand's rice industry do not emphasize improving productivity. Reflecting a quality-over-quantity approach, Thai rice policy favors developing its jasmine rice exports over long grain white rice.

China

China is the largest producer and consumer of rice, accounting for more than a quarter of global rice production and consumption. China produces long grain rice as well as medium and short grain rice. Long grain rice accounts for roughly two-thirds of total production. Rising costs and a steady increase in urbanization, particularly around the southern coastal cities, have caused rice production in the north to expand relative to the south. Generally, farms in northern China are larger and more mechanized than farms in southern provinces. Efforts to modernize the industry have led to improved yields, stable production, and upgraded supply chain efficiencies through consolidation. However, constraints on the availability of land, labor, and water also continue to put pressure on rice production. Traditionally, rice has been the primary staple food in China and rice self-sufficiency is a critical priority to China's food security policy. As a result, the Chinese government plays an active role in China's industry structure, including minimum planted areas, grain output targets, and the administration of state-owned enterprises across the rice value chain. The Chinese government also implements numerous policy measures to support and incentivize rice production. These measures include minimum support prices, rice reserves, and TRQ policies to manage the country's rice supply.

Historically, China's domestic rice production has met domestic rice demand with little need for rice imports. Trade accounts for a relatively small share of China's domestic rice market, but its imports and exports have major implications for the global market because of China's large market size. During the 2018–23 period, China's rice imports and exports fluctuated on the basis of government policies and global rice market conditions, and China's projected rice stocks accounted for a significant share of global rice stocks. How China sheds its excess rice inventory, including via exports at a relatively low price in the global market, has been of interest to the global rice industry.

The competitiveness of China's rice industry in its domestic market is mainly based on reliability of supply and delivered costs, both of which are bolstered by government policies. Minimum support prices and production subsidies incentivize rice production, and China's public stockholding system prioritizes domestic rice market stability. In addition, China's TRQ policy limits the volume of rice imports, and higher tariffs on imports over the quota enhance the delivered cost advantage for domestic producers over out-of-quota imports. China has limited reliability of supply as an exporter because export levels fluctuate according to domestic-focused government policies. However, agricultural policies that support production, which has exceeded consumption in many years, position China to have the capability to export. In particular, old-crop rice (rice harvested from previous years and held in reserves) has historically been price competitive in the global rice market.

Indonesia

Indonesia dropped to the fourth-largest producer of rice globally beginning in marketing year 2018/19, when Bangladesh's production levels began exceeding those of Indonesia. Indonesia produces primarily long grain white rice, as well as short grain white rice, brown rice, and specialty varieties. The Indonesian rice sector is dominated by smallholder farmers. The small size of land holdings, combined with the reliance on traditional farming techniques, make the rice sector extremely labor intensive. Indonesia has been able to produce a large share of its domestic consumption needs; however, stagnating yields, decreasing cropland, and population growth have caused aggregate consumption to outpace production. Nonetheless, domestic self-sufficiency is a major priority for the Indonesian government, focusing on staple crops, including rice. The Indonesian government is heavily involved in the domestic rice industry. At the producer level, market price support and input subsidies are the main forms of support provided to producers. Indonesia maintains public stocks, which are managed by Bulog, the State Logistics Company.

Indonesia exports minimal amounts of rice, despite being a top global producer. As part of its focus on food sovereignty and self-reliance, the Indonesian government restricts the import and export of rice. Imports of rice are only permitted when government and industry stocks are low and when domestic supply is short, and medium quality rice must be imported through Bulog. Conversely, exports are only permitted after meeting year-end public stock reserves and domestic consumption needs. During the 2018–23 period, drought-related production shortages led to a significant decrease in domestic supply. Thailand and Vietnam supplied the large majority of Indonesia's increased demand for imports during this period.

Several factors limit Indonesia's export potential, including the Indonesian government's emphasis on food self-sufficiency, the rice sector's relatively high cost of production, as well as certain government policies. The Indonesian government's focus on achieving rice self-sufficiency prioritizes domestic consumption needs over export opportunities. Even if Indonesia had an exportable surplus of rice, its competitiveness vis-à-vis other rice-producing countries, particularly in Asia, would be hindered by its relatively high cost of production. Finally, though Indonesia's rice sector benefits from strong government support, some of these policies, particularly producer price supports and import restrictions, come at the expense of the industry's competitiveness in the global market relative to other countries.

South America

Brazil

Brazil is the largest rice producer in South America and the ninth-largest exporter in the world. It produces nonaromatic long grain rice and exports it in both paddy and milled forms. Rice production in Brazil is characterized by large agribusinesses and mechanized processes concentrated in Southern Brazil. Rice cultivation in Brazil uses two main production methods: irrigated, which dominates in the south and is responsible for over 90 percent of production, and rainfed, which occurs upland. Rainfed farms are generally smaller and are on the decline. Government intervention in Brazil's rice industry is minimal, although Brazil has used market price support tools in the past for rice and other crops. Despite minimal government intervention, rice production benefits from extensive government-led research and development in increasing yields and developing rice varieties with desirable attributes.

Approximately half of Brazil's rice exports by value are of paddy rice, followed by broken rice, at just over 25 percent. Between 2018 and 2023, Brazilian exports were concentrated in a few major destination markets, with both quantities and values fluctuating widely during the period. The most significant development was the emergence of Mexico as the leading destination. Brazil is also an importer of rice, almost entirely from Paraguay and Uruguay. Over this period, imports grew to meet higher domestic consumption during the COVID-19 pandemic and lower domestic supply.

Brazil is a competitive exporter in both paddy and milled rice market segments, particularly when exporting to Mexico and Central America. Although production costs are relatively high, Brazil's efficient, mechanized production practices allow delivered costs to remain competitive against the United States and other exporters. Brazil, along with the United States, is one the few countries that export significant quantities of paddy rice. In this market segment, Brazil is cost competitive against other high-cost exporting countries operating highly mechanized production systems in the Western Hemisphere. However, relatively high transportation costs can erode the competitiveness of Brazilian rice in both domestic and export markets.

Uruguay

Uruguay's rice production is small compared to many other major exporters, but nearly all of it is exported, making Uruguay the 10th-largest rice exporter in the world in 2023. Domestically, Uruguay consumes negligible amounts of rice. Rice production in Uruguay is efficient, highly mechanized, and entirely irrigated. Farm sizes are large and have some of the highest yields in the world. Rice milling is coordinated through an industry association that provides support services and enters price-setting agreements with producers. Such arrangements ensure the quality of Uruguayan rice and provide financial liquidity for producers to make investments. Uruguay's government support for the agricultural sector, including for rice, is minimal. Existing government policies focus on supporting the rice sector's productivity levels, particularly through extensive investment in research and development.

Uruguay primarily exports milled long grain, nonaromatic rice to other Western Hemisphere countries, although brown rice and paddy rice exports are on the rise. Despite a rise in exports, Uruguay's rice exports are facing increased competition from Paraguay in the Brazilian market. Uruguay imports negligible quantities of rice.

Uruguay's competitiveness in rice is because of relatively low costs of production and a reputation for high quality nonaromatic rice. Efficient production on large farms with high rates of mechanization support low-cost production. Organization across the value chain and strong research and technical assistance from the public and private sectors support the export of high-quality long grain rice. However, rice production in Uruguay has not increased significantly over the 2018–23 period because of land and water constraints and leveling yields. This trend suggests that the growth potential for Uruguay's rice industry may be limited.

Paraguay

Like Uruguay, Paraguay's rice industry is almost entirely export oriented, owing to virtually no domestic consumption. As with other industries in its agriculture sector, Paraguay's rice industry is growing quickly, particularly along the Paraguay River, driven by low land and irrigation costs. These low costs have also attracted private sector investment from neighboring countries. Paraguay's rice industry is vertically integrated and characterized by large—and expanding—agribusinesses. Small-scale farmers are exiting the market because of competition from large, mechanized producers. This has caused a sharp decline in the number of rice farms in Paraguay, despite a large increase in planted area. Paraguayan producers plant rice varieties from neighboring countries, with 11 of the 30 registered cultivars developed in Brazil. Growers and millers are mostly vertically integrated. Despite rapid industry growth, Paraguay's industry expansion is constrained by infrastructure bottlenecks. The government of Paraguay does not directly intervene in the rice industry. However, Paraguay undertakes certain activities to promote the agricultural sector, including some subsidies and tax policies that support agricultural production.

Nearly all of Paraguay's rice production is destined for the Brazilian market. Although the president of Paraguay has expressed Paraguay's aspirations to become a global leader in the rice industry, Brazil was its only major export destination as of 2023. During the 2018–23 period, about 50 percent of exports were of white rice and 30 percent were of brown rice; broken rice and a small amount of paddy rice account for the remainder. Consistent with virtually no domestic consumption, rice imports were minimal during this period.

Paraguay has only recently become a major global rice-exporting country. Its export competitiveness is due primarily to Paraguay's low land cost, which has encouraged rice producers to expand planted area and invest more in mechanized production practices. Cost competitiveness has especially fueled the rapid growth of Paraguayan rice exports to Brazil. Although Brazil offers Paraguay a reliable export market, Paraguay's rice industry is dependent on Brazil for both cultivar development and sales. This exposes Paraguay's rice industry to risks from fluctuations in the Brazilian market and inhibits the Paraguayan industry from developing different varieties of rice for different market segments.

Chapter 1 Introduction

In a letter dated February 5, 2024, the House Committee on Ways and Means (Committee) asked the U.S. International Trade Commission (USITC or Commission) to conduct an investigation and produce a report under section 332(g) of the Tariff Act of 1930 (19 U.S.C. § 1332(g)) that examines the global competitiveness of the U.S. rice industry.[2] As requested by the Committee, this report contains updates to a 2015 Commission report on the U.S. rice industry; this new report describes significant changes to rice production and markets worldwide from 2018 to 2023.[3]

More specifically, to the extent data and information are available, the Committee requested that the report contain:

- information on recent developments in the rice industries of the United States and other major global producing and exporting countries, such as Bangladesh, Brazil, China, India, Indonesia, Pakistan, Paraguay, Thailand, Uruguay, and Vietnam;
- information on recent trade trends and developments in the global market for rice, including U.S. and major foreign supplier imports and exports;
- a comparison of the competitive strengths and weaknesses of rice production in, and exports from, the United States and other major exporting countries, focusing on factors affecting delivered cost, product differentiation, and reliability of supply, as well as government policies and programs that directly or indirectly affect rice production and exporting in these countries;
- a qualitative and, to the extent possible, quantitative assessment of the impact of government policies and programs, including public stockholding programs and export restrictions, of major producing and exporting countries on U.S. rice production, producer revenues and profits, consumption, trade, and prices, as well as on food security in developing countries; and
- an overview of the impact on the U.S. rice industry of rice exports from major producing and exporting countries to the United States and to traditional export markets of the United States.

Scope of the Report and Classification of Rice

The scope of this report covers the U.S. and global industries that produce and export rice. Within the *Harmonized Commodity Description and Coding System* (Harmonized System or HS), rice is classified under HS 4-digit heading 1006. Under this heading, rice is further classified at the HS 6-digit subheadings as rice in the husk (paddy or rough) (1006.10), husked (brown) rice (1006.20), semi-milled or wholly milled rice, whether or not polished or glazed (1006.30), and broken rice (1006.40).[4] Some countries, including the United States, have additional tariff classifications for parboiled rice, which is prepared by placing milled rice in hot water and heating it further (generally by steaming), then drying it again, as

[2] For a copy of the letter, see appendix A.
[3] USITC, *Rice: Global Competitiveness*, April 2015.
[4] USITC, *Harmonized Tariff Schedule (2024), Rev. 10*, November 2024.

described later in this chapter. Both paddy and parboiled rice can be of any grain length, variety, and quality.

Within the industry, rice is classified by type on the basis of grain length, variety, and quality.[5] Grain length refers to the length of the grain in relation to its width and has three categories: long, medium, and short. Long grain rice has kernel lengths that are four to five times their width.[6] Long grain rice makes up about three-quarters of U.S. production and is mostly produced outside California.[7] Medium grain rice has kernel lengths that are two to three times their width.[8] In the United States, medium grain rice is produced mainly in California and composes about one-fourth of overall rice production. Short grain rice has kernels that are nearly round. Short grain rice accounts for about 2 percent of U.S. production.[9]

Rice is also classified by variety, principally indica, japonica, aromatic, and glutinous. The most prominent variety is indica rice, which has grains that are long and thin and become drier and flakier with cooking.[10] It supplies between 62 and 66 percent global rice trade and is grown in tropical and subtropical climates, including India, Pakistan, Thailand, Vietnam, Indonesia, southern China, and Brazil.[11] Japonica rice has short, fat grains that are typically sticky when cooked. This type of rice is grown in more temperate climates, such as Japan, South Korea, China, and California. It makes up about 10 percent of global trade.[12] Aromatic rice is distinguished by its nutty or popcorn-like aroma. The most common aromatic varieties are jasmine and basmati rice (both indica varieties), which command premium prices.[13] Aromatic rice composes about one-quarter of global rice trade.[14] Most aromatic rice is long grain rice. In keeping with common practice in the industry, this report treats aromatic rice separately because of its unique qualities and the price premiums it commands. Glutinous—or sticky or sweet—rice has short, plump grains that become glued together when cooked.[15] Contributing less than 2 percent of global trade, this type of rice is considered higher value and grown primarily in Southeast Asia.[16]

Approach

As requested by the Committee, this report assesses the competitiveness of the U.S. rice industry in global markets using both qualitative and quantitative approaches. The report’s cross-country analysis relies on an agricultural competitiveness framework that connects analytic assumptions, parameters, and structures that define competitive conditions in agricultural trade (chapter 3). This framework

[5] A detailed description of rice classification covering grain length, variety, and quality is provided in the USITC 2015 rice report. These have not changed and remain relevant for the 2018–23 period. USITC, *Rice: Global Competitiveness*, April 2015, 32–35.
[6] FAO, “Physical Grain Characteristics of Paddy/Milled Rice,” accessed November 6, 2024.
[7] USDA, ERS, “Rice Sector at a Glance,” September 27, 2023.
[8] FAO, “Physical Grain Characteristics of Paddy/Milled Rice,” accessed November 6, 2024.
[9] USDA, ERS, “Rice Sector at a Glance,” September 27, 2023.
[10] USDA, ERS, “Rice Sector at a Glance,” September 27, 2023.
[11] USDA, ERS, “Rice Sector at a Glance,” September 27, 2023.
[12] USDA, ERS, “Rice Sector at a Glance,” September 27, 2023; USITC, *Rice: Global Competitiveness*, April 2015, 33.
[13] IRRI, *Aromatic Rices*, 2000, 47.
[14] USDA, ERS, “Rice Sector at a Glance,” September 27, 2023.
[15] USA Rice Federation, “Understanding Rice Varieties, Types, and Forms,” accessed October 29, 2024, 15.
[16] USDA, ERS, “Rice Sector at a Glance,” September 27, 2023; Wan, “What Is Sticky Rice?” May 8, 2023; USITC, *Rice: Global Competitiveness*, April 2015, 34.

focuses on factors affecting delivered cost, product differentiation, and reliability of supply of major global producers highlighted in this report. The Commission also used a partial equilibrium model to estimate the impacts of certain government policies and programs of major exporting and importing countries on U.S. rice production, producer revenues and profits, consumption, trade, and prices, as well as on food security in developing countries (chapter 8).

As requested, the report includes country profiles (chapters 4–7) that contain descriptive information on the United States and other major producers and exporters of rice. These chapters contain information on the factors present in each country's industry that contribute to its competitiveness. The Commission gathered information for the report by conducting domestic and foreign fieldwork, reviewing published academic literature and industry reports, and interviewing sources knowledgeable about the industries. These sources included rice farmers, millers, and processors, as well as government officials, traders, academics, and representatives of firms, trade associations, and nongovernmental organizations. The Commission also obtained industry and product information from testimony provided at the Commission's public hearing by government officials and industry representatives on April 30, 2024, as well as written submissions.

Relevant production and trade data used in the report were collected from publicly available data sources, as well as from industry representatives and organizations outside the industry. The Commission obtained global production and trade data from the U.S. Department of Agriculture (USDA) National Agricultural Statistics Service and Foreign Agricultural Service; S&P Global's Global Trade Analytics Suite; and the Food and Agriculture Organization of the United Nations (FAO). Additional trade data came from the U.S. International Trade Commission Interactive Tariff and Trade DataWeb/U.S. Census Bureau (USITC DataWeb/Census), a database built using U.S. Census Bureau data. International rice price data were obtained from the FAO. Production costs were obtained from various sources.[17] Other data and information used in this report are from nongovernmental organizations, academia, and industry sources.

Rice production data presented in the report are primarily from USDA's Production, Supply, and Distribution (PSD) Online database. The PSD Online database contains quantity (not value) data on country sources of rice (i.e., beginning stocks, domestic production, and imports) balanced with country uses of rice (i.e., domestic consumption, exports, and ending stocks). The database has comprehensive coverage in terms of both countries and reporting years included in this report, and it is consistent in its reporting. PSD data are reported on a "marketing year" (MY) basis, rather than by calendar year. Marketing years are not uniform across countries, but for most of the countries profiled in this report, they run from about the beginning of the second calendar quarter to the end of first calendar quarter of the following year. Throughout the report, references to "MY" indicate that the data are based on that country's marketing year as reported by the PSD Online database.

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[17] Data on production costs were not available from a single source. Instead, staff sourced production cost data from government agencies for Bangladesh, Brazil, India, Pakistan, and the United States; rice growers' associations for Uruguay; and the International Rice Research Institute for China, India, Indonesia, the Philippines, Thailand, and Vietnam.

U.S. Rice Industry

Rice is an important commodity within the U.S. agricultural economy. In 2022, the value of shipments from the U.S. rice milling industry was close to $4 billion and was responsible for more than 5,500 jobs in about 90 establishments.[18] In 2023, more than 5,500 U.S. farms produced rice on about 2.8 million acres of cropland, and U.S. farmers earned $3.5 billion in cash receipts from sales of rice.[19] According to the USA Rice Federation, estimates suggest that the rice industry contributes about $34 billion to the U.S. economy and supports 125,000 jobs.[20] U.S. production is concentrated in several southern states (mostly Arkansas, Louisiana, Mississippi, and Texas) and in northern California.[21] In many of these states, rice makes up a significantly larger share of agricultural production than nationally. In Arkansas, for example, rice was the second-largest crop (after soybeans) with a 27 percent share of cash receipts from crop production in 2023, and in Louisiana, it contributed 16 percent of cash receipts from crop production.[22]

The U.S. rice industry is highly dependent on export markets. In MY 2023/24, the United States exported about 3 million metric tons of rice, equivalent to 45 percent of its domestic production.[23] Between 2018 and 2023, the United States was the world's fifth-largest exporter by volume, after India, Thailand, Vietnam, and Pakistan, with a 6 percent (4 percent by value) share of global exports.[24] In the global paddy rice market,[25] the United States plays a much larger role and is consistently the world's largest supplier. During 2018–23, the United States supplied about 45 percent of global paddy rice export volume (45 percent by value) and paddy rice made up about two-fifths of all U.S. rice exports.[26] The primary foreign markets for U.S. rice are Mexico, Haiti, Japan, Iraq, and Canada.[27]

The U.S. rice industry benefits from various strengths that support its competitiveness, including advanced agricultural technologies, consistent quality, favorable trade terms, a diverse product selection, and efficient distribution networks.[28] These factors have strengthened the position of U.S. rice as a reliable choice in both domestic and international markets. However, this competitive position faces challenges due to increased competition from international producers that may offer lower prices and other varieties. Those competitive advantages gained international producers increased access to markets formerly dominated by U.S. exporters. Also, currency exchange rates, trade policies, and consumer preferences continue to play roles in shaping the competitive landscape.[29]

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[18] The rice milling industry as defined by North American Industry Classification System code 311212. The latest year for which data are available is 2022. U.S. Census Bureau, "Census Bureau Tables," accessed November 7, 2024.
[19] USDA, ERS, "Cash Receipts by State," accessed various dates; USA Rice Federation, "U.S. Rice Facts," accessed November 7, 2024.
[20] USA Rice Federation, "U.S. Rice Facts," accessed November 7, 2024.
[21] USA Rice Federation, "Where Rice Is Grown," accessed November 7, 2024.
[22] Nationally, cash receipts from rice make up about 1 percent of total cash receipts from crop production. USDA, ERS, "Cash Receipts by State," accessed various dates.
[23] USDA, FAS, "PSD Online database," accessed various dates.
[24] S&P Global, GTAS database, Exports, HS Heading 1006, accessed June 17, 2024.
[25] Paddy rice, or rough rice, refers to the whole rice grain before the hull and husk have been removed.
[26] S&P Global, GTAS database, Exports, HS Heading 1006, accessed June 17, 2024.
[27] S&P Global, GTAS database, Exports, HS Heading 1006, accessed June 17, 2024.
[28] USITC, *Rice: Global Competitiveness*, April 2015, 134.
[29] Details of competitive factors for several countries are described in the country chapters 4–7 and 9 of this report.

Global Rice Production, Processing, and Quality

Production and Processing

Rice undergoes various stages of production and processing before it becomes the consumable form found in grocery stores.[30] Cultivation begins with planting in paddies, which can be either rainfed or irrigated. Harvesting typically occurs about four months after planting (figure 1.1).[31] An initial step in harvesting rice is threshing, which removes plant material from the grain.[32] After harvesting, the rice is known as "paddy rice," or "rough rice," which is dried to reduce moisture content from about 20 percent to about 12.5–14 percent, a level suitable for preventing spoilage while in storage.[33]

The technology used in these processes varies globally. For example, in the United States, planting, harvesting, and drying are highly mechanized, involving modern machinery and commercial drying facilities. In contrast, in many developing countries, manual planting and harvesting are common. Rice is often sun-dried, although some mills use drying machines to improve quality and efficiency. Rice processing continues with cleaning, which may be followed by parboiling—a process where rice is soaked, steamed, and then dried. Parboiling hardens the grain, reducing breakage during milling and retaining nutritional value, a quality preferred in certain markets.

The cleaned rice is husked to remove the hull, resulting in brown rice, which can be sold in this form. Brown rice can be further milled to remove the bran layer, yielding white rice, the most widely traded and consumed form. The milling process can also include polishing. Both brown and white rice may undergo mechanical sizing and grading to identify and separate broken kernels. After milling, white rice can be enriched with vitamins and minerals such as iron, niacin, and thiamin.

After sorting and enrichment, the product is packaged for distribution directly to consumers or for further processing as a component of other food products or for industrial use. Rice can be sold as paddy, parboiled, brown, or white, with additional options like precooked, crisped, and puffed forms for quick preparation or unique textures. Beyond its use as a simple food product, rice may serve as an ingredient in processed food products, such as noodles, breakfast cereals, prepared frozen meals, brewed products (such as beer), and pet food.[34] Rice also has industrial applications, including in ethanol and pharmaceuticals production.

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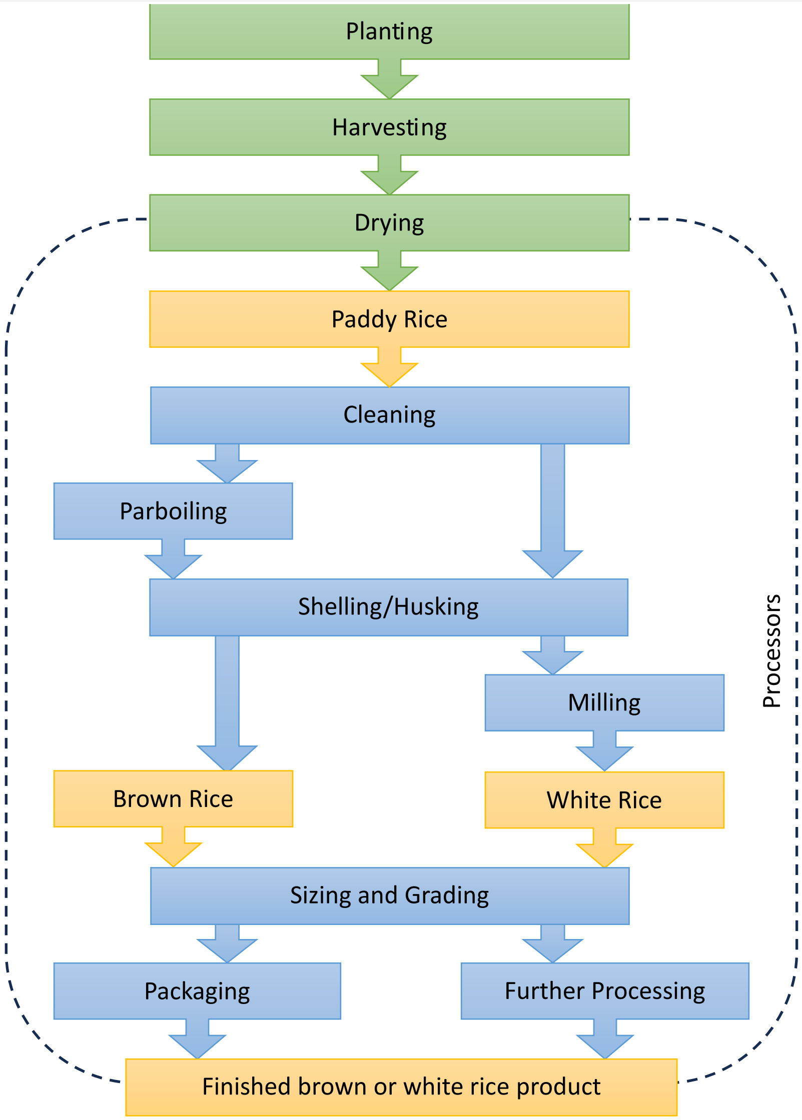
[30] The 2015 report provided a detailed description of rice production and processing methods. This information remains the same for the industry in 2025 (figure 1.1). USITC, *Rice: Global Competitiveness*, April 2015, 28–32.
[31] For information on rice processing, see IRRI, "Modern Rice Milling," 2000; USDA, ERS, "Rice Sector at a Glance," September 27, 2023.
[32] IRRI, "Harvesting," December 19, 2024.
[33] USITC, *Rice: Global Competitiveness*, April 2015, 28.
[34] USITC, *Rice: Global Competitiveness*, April 2015, 32.

Figure 1.1 Simplified commercial rice production process



Source: USITC, *Rice: Global Competitiveness*, April 2015, 29.

Quality

In addition to grain length and variety, rice is characterized by its quality. Rice quality is subjective and used as a means by which exporting countries can differentiate their products as they compete in the global market to meet the specific preferences of customers. For example, in Japan and South Korea, where rice is the major staple in the national cuisine, short grain and medium grain rice are most often used (e.g., for sushi rice). In many high-income countries, including the United States, consumers prefer high-quality long grain rice and, increasingly, aromatic rice, most of which must be imported from India and Thailand. Some countries are mostly seeking to import broken rice, which consists of fragments of rice grains that break during milling. Rice with a higher percentage of broken kernels is typically considered to be of lower quality and therefore has a lower cost, so it is more affordable to lower-income countries. It is also imported by high-income countries for use in processed foods and beverage production.

For all varieties of rice, quality depends on several factors, including its growing, milling, storage conditions, and handling. Among the factors that adversely affect rice quality is the percentage of broken or chalky kernels contained in whole rice. Broken kernels are kernels that are less than three-fourths of whole kernels, and chalky kernels are kernels that are opaque (or have an opaque area) and are prone to break during milling. Another measure of quality is the degree of commingled varieties together in a batch, such as rice grown from different types of seeds and with different characteristics. Excessive commingling can contribute to quality problems during milling. Also, rice quality is gauged by its organoleptic or sensory properties desired by consumers when cooked.[35]

The Importance of Rice in Global Food Security

Rice is a primary staple food for more than half the world's population, and for several regions its consumption is crucial to food security. One measure of the importance of rice to food security is annual per capita consumption.[36] Annual per capita consumption of rice globally was about 65 kilograms in MY 2023/24, with a wide range across major regions of the world.[37] In some regions, particularly in Asia, per capita rice consumption is high. For example, in Southeast Asia (including Burma, Cambodia, Indonesia, Thailand, and Vietnam) per capita rice consumption was close to 160 kilograms in MY 2023/24; in South Asia (including Bangladesh, India, Pakistan, and Sri Lanka) it was just over 85 kilograms. In West Africa, per capita consumption was approximately 55 kilograms; in South America, per capita consumption was close to 40 kilograms; and in the United States and Europe, it ranges between 8 and 13 kilograms.[38]

Another measure of rice's importance to food security is the population's share of daily calories derived from rice consumption. In many countries, especially some developing countries, populations obtain large shares of—or even the majority of—their daily calories from rice. For example, in Bangladesh in 2022, the amount of rice available for consumption per capita was about 63 percent of the amount of all food available for consumption per capita. In Burma, Cambodia, and Madagascar, the share was over 50 percent.[39] Although countries profiled in this report are selected on the basis of their rice production and exports, some of these countries are also large consumers of rice. Bangladesh, Indonesia, Thailand, and Vietnam have diets where rice constituted 40 percent or higher of daily calories available for consumption in 2022 (table 1.1). Rice's share of total daily available calories fell across almost all profiled countries between 2010 and 2022. Vietnam (−11.7 percentage points), Bangladesh (−8.4 percentage

[35] Organoleptic properties for rice include stickiness, color, firmness, texture, translucence, grain shape, aroma, and taste.
[36] More information on per capita rice consumption trends is provided in chapter 2.
[37] USDA, FAS, "PSD Online database," accessed December 28, 2024; World Bank, "World Bank Data: Population," accessed July 22, 2024.
[38] Per capita consumption of rice in discussed further in chapter 2 of this report.
[39] Share of kilocalories available for consumption. FAO, "Food Balances; All countries; Food Supply (kcal/capita/day); Population and Rice and products; 2022," accessed various dates.

points), and Indonesia (−7.2 percentage points) saw the largest decreases. Meanwhile, the share remained virtually unchanged in the United States and Thailand.

Table 1.1 Daily per capita calories available for consumption from rice for select countries, 2022
In kilocalories (kcal) and percentages (%).

Country	Daily calories from rice (kcal)	Total daily calories (kcal)	Share (%)
Bangladesh	1,631	2,581	63
Vietnam	1,375	3,072	45
Thailand	1,201	2,878	42
Indonesia	1,125	2,830	40
China	871	3,442	26
India	632	2,589	24
Brazil	246	3,305	7
Pakistan	114	2,443	5
Uruguay	93	3,307	3
United States	79	3,912	2
Paraguay	36	3,056	1

Source: Food and Agriculture Organization of the United Nations (FAO), FAOSTAT database, "Food Balances," accessed various dates.

As well as being a key staple and source of calories, rice has important cultural and historical connections in many high-consumption countries. In particular, in Asia, where the rice plant is believed to have first originated, rice takes on ritual, ceremonial, symbolic, and economic importance.[40] For example, in many Asian cultures and societies, rice is incorporated directly into religious rituals and is linked to human fertility. From its origins in Asia, the cultivation of rice spread to Europe and later to the Americas.[41] Although ancient civilizations are believed to have independently domesticated Amazonian rice varieties in South America, European colonizers are largely responsible for introducing present-day rice varieties to those countries, where it has become a cultural and culinary staple in many countries.[42]

Government Policies in Rice Markets

The global market for rice is characterized by a significant level of government intervention in both producing and consuming countries. Governments around the world intervene in the rice market for a variety of reasons. As discussed above, rice is crucial for food security in many nations, so governments take action to ensure the availability and affordability of rice as a means of preventing hunger and maintaining social stability of their populations.

For some countries, part of the motivation of governments is tied to the countries' history of food shortages and famine, and so achieving and maintaining agricultural self-sufficiency is a major political goal.[43] In many countries, rice production is a significant economic activity and a major source of employment and farmer income in rural areas. Because rice cultivation is labor intensive, it provides

[40] Rice Association, "History of Rice," accessed November 7, 2024; USDA, ERS, "Rice Sector at a Glance," September 27, 2023; Crystal and Whittlesey, "The Role of Rice in Southeast Asia," 2004.
[41] Rice Association, "History of Rice," accessed November 7, 2024.
[42] USDA, ERS, "Rice Sector at a Glance," January 7, 2025; Normile, "Rice So Nice It Was Domesticated Thrice," October 10, 2017.
[43] For example, the Bengal famine of 1943 and the Chinese famine of 1959–61. Puri, "Bengal Famine," February 23, 2024; Smil, "China's Great Famine," December 18, 1999.

livelihoods and employment to millions of smallholder farmers and rural workers. Agricultural workers in these countries often have a certain amount of political power (e.g., in India) or have the potential for creating civil unrest in rural areas where poor living conditions and scarce economic opportunities persist. As a result, governments endeavor to create domestic policies and trade policies that work together to keep rice supplies, prices, and farmer incomes stable.[44]

Governments use a wide range of policy tools to control production, prices, trade, and consumption of rice. Production policies include input support (e.g., input subsidies, crop insurance, finance, and credit facilities). Producer price policies include government procurement, price controls, minimum support price, stock release, controls on futures trading, and storage subsidies. Together, production and producer price policies are aimed at providing incentives to farmers to ensure that input and output prices allow farmers to produce profitably.[45]

Trade policies affect both imports (e.g., quotas, tariffs, tariff-rate quotas, tax policies, import requirements) and exports (e.g., export promotion, taxes, bans, or requirements). Barriers to imports are aimed at protecting domestic rice industries from competition from imports. Restrictions on exports are typically designed to ensure domestic availability of supply and to protect domestic consumers from higher international prices. Finally, consumption policies include food aid (e.g., direct distribution of rice, food subsidies), price ceilings for domestic consumers, and regulations that ban rice as animal feed.[46] At the consumer level, these interventions, like export restrictions, are aimed at ensuring that rice is available for purchase and at affordable prices.

Most countries profiled in this report have various government policies that impact the rice market (table 1.2). Policies directed toward production are used in the United States, Bangladesh, China, India, Indonesia, Pakistan, Thailand, and Vietnam. For example, input subsidies are a significant component of India's agricultural policies, which includes support for irrigation, fertilizers, and electricity for low-income farmers. Policies directed toward producer price stabilization are in effect in Bangladesh, Brazil, China, India, Indonesia, Thailand, and Vietnam. For example, China's public stocks play an important role in facilitating the minimum support price program as well as stabilizing China's grain market. Rice import policies have been established in China, Bangladesh, and Indonesia. For example, Indonesia heavily restricts rice imports through tariff-rate quotas, and the government holds an import monopoly on the most common type of consumed rice. Similarly, Burma, India, Indonesia, and Vietnam have, at least at times, used policies to manage exports. For example, in spring 2020, Vietnam temporarily restricted rice exports in response to uncertain supply and demand conditions resulting from the COVID-19 pandemic. Rice consumption policies have been set by India and Indonesia. For example, in 2019, Indonesia transformed its food aid program from physical distribution of rice to an electronic voucher program.[47]

[44] FAO, *Food Outlook*, various issues.
[45] Examples of government policies are discussed in the country profile chapters (4–7) of this report. Also, FAO, *Food Outlook*, various issues.
[46] For example, prior to 2015, rice was banned for feed use in Korea. USDA, ERS, "Rice in Asia's Feed Markets," December 2018, 11.
[47] OECD, *Agricultural Policy Monitoring and Evaluation 2023*, October 30, 2023, 372, 374.

Table 1.2 Selected government policies impacting rice markets

— = not applicable.

Policy type/Policy instrument	United States	India	Pakistan	Bangladesh	Vietnam	Thailand	China	Indonesia	Brazil	Uruguay	Burma	Japan	Korea	Philippines
Production input subsidies	—	X	X	X	—	X	X	X	—	—	X	X	X	X
Crop insurance assistance	—	X	—	X	—	X	X	—	X	—	—	X	—	X
Production finance and credit	X	X	X	X	X	X	X	X	X	X	X	—	—	X
Producer price support	X	X	X	X	—	X	X	X	X	—	X	X	—	X
Import tariffs	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Import quotas/tariff-rate quotas	—	—	—	X	X	—	X	X	X	—	—	X	X	X
Import safeguards	—	—	—	—	—	—	—	—	—	—	—	—	—	X
Import taxes policy	—	X	—	—	—	—	—	—	—	—	—	—	—	—
Import agreement	—	—	—	X	—	—	—	X	—	—	—	—	—	—
Export taxes	—	X	—	X	—	X	—	—	—	—	—	—	—	—
Export quotas	—	X	—	—	—	—	—	X	—	—	X	—	—	X
Export ban	—	X	—	X	—	—	—	—	—	—	X	—	—	—
Export requirements	—	X	—	—	X	—	X	—	—	—	X	—	—	—
Food subsidies	—	X	X	X	X	—	—	X	—	—	—	—	—	X
Consumer price controls	—	—	—	—	—	X	—	X	—	—	—	—	—	—
Food aid	X	—	—	—	—	X	X	—	—	—	—	X	X	—

Source: Compiled by the USITC from FAO, *Food Outlook–Biannual Report on Global Food Markets*, various issues, 2018–24 and additional sources described in chapters 4–9.
Note: Paraguay is not included in this dataset. For information about Paraguay's government programs affecting the rice industry, see chapter 7.

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Chapter 2
Overview of the Global Rice Market

Rice is the most widely consumed grain in the world and is the primary staple food for over half the world's population.[48] More than 150 countries grow rice, and its cultivation is among the largest uses of agricultural land globally.[49] Rice is produced on more than 150 million farms, many of which are smaller than 2 hectares (5 acres).[50]

During marketing years (MY) 2018/19–2023/24, Asia was the world's largest producing region, responsible for 89 percent of production[51] and 84 percent of consumption (figures 2.1 and 2.2).[52] Rice is important to the Asian economy, diet (especially to the region's 211 million impoverished people), and culture.[53] Asia also holds most of the world's stocks (93 percent in MY 2023/24) because many of the region's governments maintain stockpiles aimed at ensuring adequate supply and affordable prices for consumers.[54]

Africa is the world's second-largest producing and consuming region. Unlike Asia, however, Africa has a deficit in rice production and is a major global importing region. During MY 2018/19–2023/24, it accounted for less than 5 percent of global production but 8 percent of global consumption.[55] In Africa, rice production and consumption is highly concentrated in West Africa, where it is becoming increasingly important as an easy-to-prepare food.[56]

South America and North America are also surplus rice-producing regions, but on a much smaller scale than Asia.[57] During MY 2018/19–2023/24, South America and North America jointly accounted for approximately 4 percent of global production and consumption.

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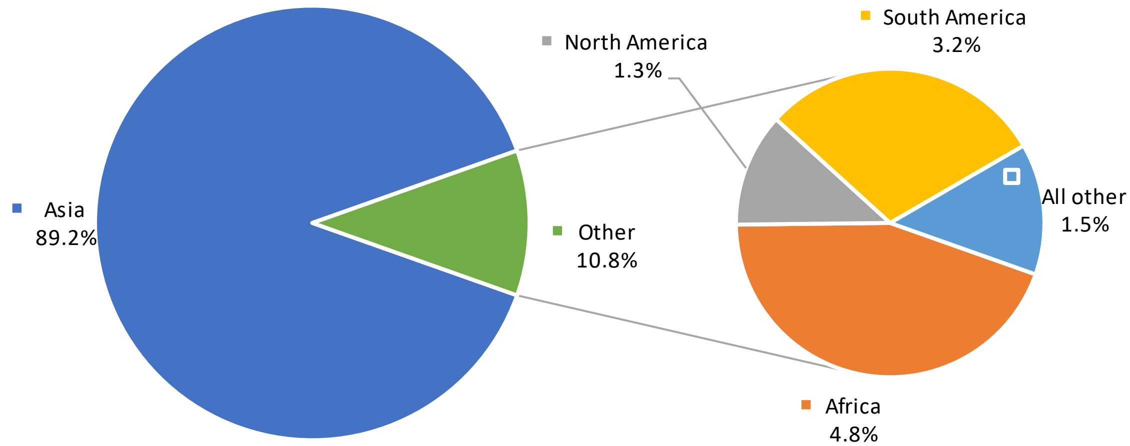
[48] USDA, ERS, "Rice," accessed various dates; USDA, FAS, "PSD Online database," accessed October 8, 2024.
[49] FAO, FAOSTAT, "Crops and Livestock Products," December 7, 2023.
[50] International Rice Research Institute, "What We Do: Prosperity," accessed December 12, 2024.
[51] Total rice production can be measured in paddy rice (also known as rough rice) or as milled rice equivalent. For this study, "rice production" refers to production on a milled rice equivalent basis, unless otherwise mentioned. To convert paddy and brown rice into milled rice equivalent, the USDA uses a conversion factor of 70 percent for volumes of paddy rice and 88 percent for volumes of brown rice. In other words, the total weight of paddy rice is reduced by 30 percent and the total weight of brown rice by 12 percent to arrive at the milled rice equivalent.
[52] Asia refers to the rice-producing regions of East Asia, South Asia, and Southeast Asia. South Asia and East Asia each contributed about one-third of global production while Southeast Asia accounted for one-quarter of global production during MY 2018/19–2023/24. USDA, FAS, "PSD Online database," accessed various dates.
[53] ADB, "Social Development and Poverty in Asia," May 17, 2021.
[54] USDA, FAS, "PSD Online database," accessed December 27, 2024; OECD, *The Economic Effects of Public Stockholding Policies for Rice in Asia*, October 18, 2018.
[55] Africa held about 2 percent of global rice stocks in this period. USDA, FAS, "PSD Online database," accessed December 27, 2024. See appendix F for regional listing.
[56] Soullier et al., "The State of Rice Value Chain Upgrading in West Africa," June 1, 2020.
[57] Central America is not included as part of South America and North America (which includes Mexico) in the USDA, FAS, PSD Online database. Central America's consumption represents about one-quarter of 1 percent of global consumption. It is a deficit region with about half of its consumption from production and half from imports.

Figure 2.1 Share of global milled rice production volume, by region, average for marketing years 2018/19–2023/24

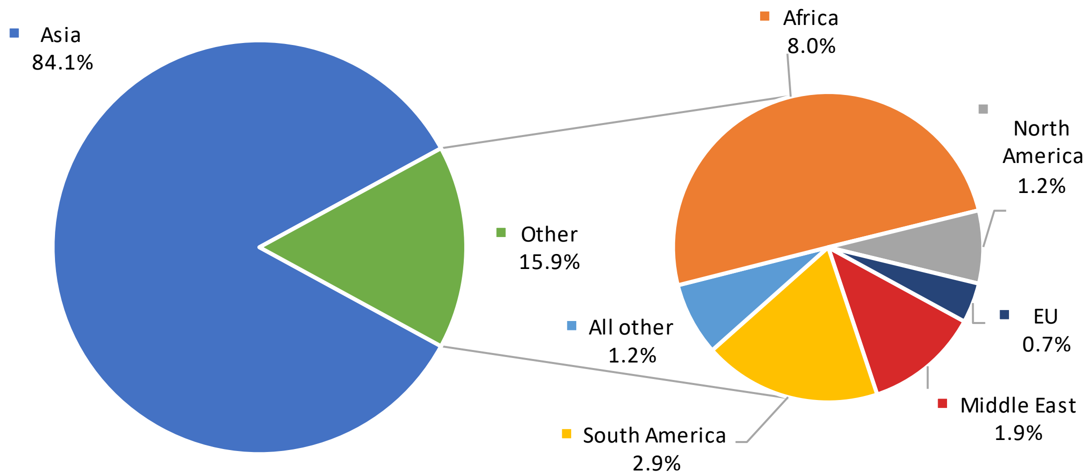
In percentages. Underlying data for this figure can be found in appendix F, table F.2.



Source: USDA, FAS, PSD Online database, accessed December 28, 2024.
Note: All other includes the Middle East, Europe, the former Soviet Union, the Caribbean, Central America, and Oceania. Individually, these regions account for less than 0.5 percent of global rice production. Totals are based on the period average.

Figure 2.2 Share of global milled rice consumption volume, by region, average for marketing years 2018/19–2023/24

In percentages. EU = European Union. Underlying data for this figure can be found in appendix F, table F.3.



Source: USDA, FAS, PSD Online database, accessed December 28, 2024.
Note: All other includes the former Soviet Union, the Caribbean, Central America, and Oceania. Individually, these regions account for less than 0.5 percent of global rice production. Totals based on period average.

The Middle East and the European Union (EU) consume more rice than they produce.[58] Between MY 2018/19 and 2023/24, the Middle East accounted for about 2 percent of global consumption, but less than 1 percent of production and stocks; the EU accounted for less than 1 percent of global production, consumption, and stocks.[59]

Trends in Production

Between MY 2018/19 and 2023/24, global rice production grew from 498.4 million metric tons (mt) to 522.6 million mt, equivalent to about 1.0 percent growth annually (table 2.1).[60] Most of this growth was driven by production trends in Asia and, to a lesser extent, Africa. Throughout the period, Asian production generally increased, rising by about 0.9 percent annually to reach 464.7 million mt in MY 2023/24, mostly because of strong growth by India and Pakistan in the South Asia region. Africa's annual production rose 1.9 percent on average between MY 2018/19 and 2023/24, the fastest rate of any region, reaching a record high of 25 million mt in MY 2023/24. In the rest of the world, production fluctuated throughout the period but remained close to the period average of 31 million mt.

Table 2.1 Global rice production volume, by major producing regions, for marketing years 2018/19–2023/24

In millions of metric tons, by marketing year.

Region	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
South Asia	165.7	169.1	174.8	181.1	186.2	192.1
East Asia	162.7	161.2	162.0	163.0	159.7	158.1
Southeast Asia	116.3	113.7	115.7	116.1	117.0	114.5
Sub-Saharan Africa	20.1	20.2	20.1	20.4	22.0	22.9
South America	16.0	16.2	17.3	16.5	16.1	16.9
North America	7.3	6.0	7.4	6.2	5.2	7.1
North Africa	2.8	4.3	4.0	2.9	3.6	3.8
Middle East	2.6	3.0	2.9	2.7	2.6	2.6
European Union	1.8	1.9	1.8	1.7	1.3	1.4
All other	3.1	3.1	3.4	3.5	3.0	3.2
Total	498.4	498.7	509.4	514.1	516.7	522.6

Source: USDA, FAS, PSD Online database, accessed December 28, 2024.

Global rice production is highly concentrated in a few major producing countries (table 2.2). During MY 2018/19–2023/24, China and India supplied about 54 percent of global production, with a small increase in India's share and decrease in China's share over the period. The country with the highest production growth was India, rising almost 3 percent annually on average over this period. All other producing countries contributed 7 percent or lower to global production. Bangladesh, Indonesia, Vietnam, and Thailand are also major rice-producing countries, which, together with China and India, contributed more than three-quarters of global rice production between MY 2018/19 and MY 2023/24. The United States ranked 13th in among top global supplying countries, with production about 6.9 million mt in 2023/24.

[58] The European Union (EU) includes 27 countries: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, and Sweden.

[59] USDA, FAS, "PSD Online database," accessed December 27, 2024.

[60] USDA, FAS, "PSD Online database," accessed various dates.

Table 2.2 Global rice production volume, by major producing countries, for marketing years 2018/19–2023/24

In millions of metric tons, by marketing year.

Country	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
China	148.5	146.7	148.3	149.0	145.9	144.6
India	116.5	118.9	124.4	129.5	135.8	137.8
Bangladesh	34.9	35.9	34.6	35.9	36.4	37.0
Indonesia	34.2	34.7	34.5	34.4	33.9	33.0
Vietnam	27.3	27.1	27.4	26.7	27.1	26.3
Thailand	20.3	17.7	18.9	19.9	20.9	20.0
Philippines	11.7	11.9	12.4	12.5	12.6	12.3
Burma	13.2	12.7	12.6	12.4	11.8	11.9
Pakistan	7.2	7.2	8.4	9.3	7.3	9.9
Cambodia	6.0	6.2	6.3	6.6	7.0	7.4
Japan	7.7	7.6	7.6	7.6	7.5	7.3
Brazil	7.1	7.6	8.0	7.3	6.8	7.2
United States	7.1	5.9	7.2	6.1	5.1	6.9
All other	56.7	58.6	58.8	56.9	58.6	61.0
Total	498.4	498.7	509.4	514.1	516.7	522.6

Source: USDA, FAS, PSD Online database, accessed December 28, 2024.

Note: China and Japan are in East Asia; Bangladesh, India and Pakistan are in South Asia; Burma, Cambodia, Indonesia, the Philippines, Thailand, and Vietnam are in Southeast Asia; and Brazil is in South America.

The production trends observed during MY 2018/19 to MY 2023/24 are broadly similar to those reported in the Commission's 2015 rice investigation, which covered the period MY 2007/08–2013/14. For example, during both periods, South Asia's rice production grew steadily at about 2–3 percent annually. Significant changes occurred between the two timeframes. Rice production in both Southeast Asia and East Asia rose during MY 2007/08–2013/14, peaked in MY 2017/18, and has since declined. Similarly, rice production in sub-Saharan Africa grew strongly in the earlier period (8 percent compound rate annually), but since MY 2018/19, the growth rate has fallen to less than 2 percent, as noted above.

Harvested Area

World rice harvested area remained stable throughout MY 2018/19–2023/24, at most deviating 2 percent annually from the period average (table 2.3). Annual harvested area in Asia mirrors the global trend, with area increasing by 0.3 percent annually between MY 2018/19 and MY 2023/24. Over this time frame, the largest rise in harvested area was in South Asia, growing by 4.7 million hectares (about 8 percent) between MY 2018/19 and MY 2023/24, driven mostly by an increase of 3.7 million hectares in India. This growth was offset by fewer hectares of farmed rice in East Asia (mostly because of declining harvested area in China) and Southeast Asia. In most other regions, harvested area growth was less than 1 percent annually. Variations in harvested area typically reflect the prices and profitability of growing competing crops, as well as weather-related factors.

Table 2.3 Rice harvested area, by region, for marketing years 2018/19–2023/24
In millions of hectares, by marketing year.

Region	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
South Asia	61.3	61.1	63.3	64.2	65.1	66.0
Southeast Asia	46.5	45.2	45.7	46.1	46.2	45.3
East Asia	33.2	32.7	33.1	33.0	32.5	31.9
Sub-Saharan Africa	14.3	14.4	14.6	14.7	14.7	15.2
South America	4.0	3.9	4.0	4.0	3.8	4.0
North America	1.2	1.0	1.3	1.0	0.9	1.2
Middle East	0.7	0.8	0.8	0.8	0.7	0.7
North Africa	0.5	0.8	0.7	0.5	0.6	0.6
European Union	0.4	0.4	0.4	0.4	0.3	0.3
All other	1.0	1.0	1.0	1.0	0.9	1.0
Total	163.0	161.3	164.9	165.7	165.7	166.1

Source: USDA, FAS, PSD Online database, accessed December 28, 2024.

Comparing harvested area trends between two six-year periods, MY 2007/08–2013/14 and MY 2018/19–2023/24, presents a picture similar to production trends. Harvested area for Southeast Asia and East Asia grew in the earlier period, peaked in MY 2014/15, and then fell during the later period. Significant changes in trends between the two periods occurred in sub-Saharan Africa, where harvested area grew 7 percent annually between MY 2007/08 and MY 2013/14 but has grown little since MY 2018/19. In South America, harvested area peaked in MY 2010/11 at more than 5 million hectares but has since fallen to fewer than 4 million hectares during MY 2018/19–2023/24.

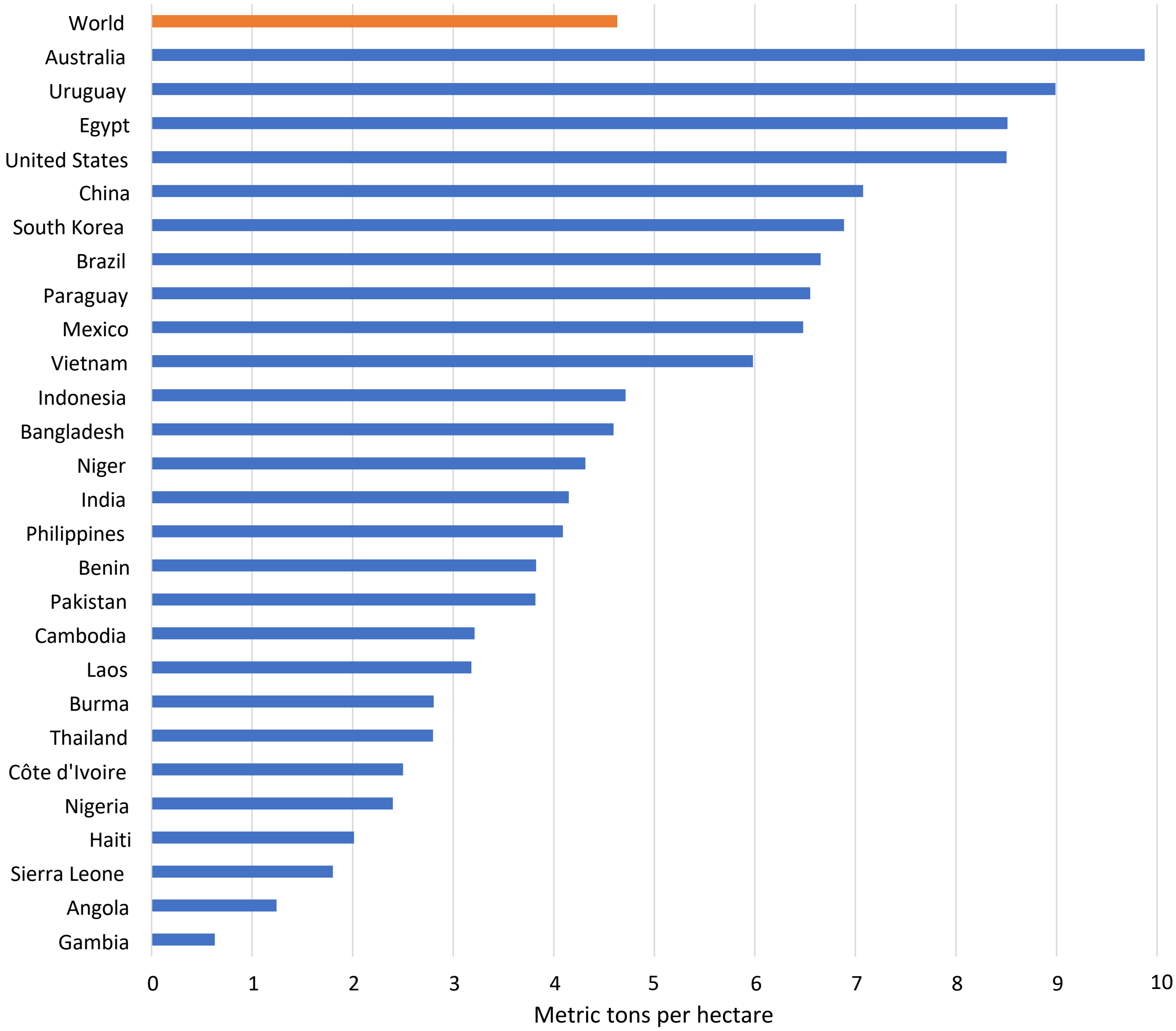
Crop Yields

Crop yields determine the level of production for any given harvested area.[61] The average global yield for paddy rice was 4.6 metric tons per hectare (mt/ha) between MY 2018/19 and MY 2023/24 (figure 2.3).[62] Owing to different rates of yield growth over time, a wide range of yields now exists among the world's major rice-producing countries. East Asia, North America, and South America generally have relatively high yields, with most countries in these regions exceeding the world average by at least 1 to 2 mt/ha. Yields in South Asia and Southeast Asia are generally below the world average and most countries there have yields between 2 and 4 mt/ha. Yields are also under the world average for most of West Africa, with about half the region below 2 mt/ha.

[61] A yield is the quantity of crop produced per unit of land. For this report, yields are given in metric tons per hectare (mt/ha).
[62] USDA, FAS, "PSD Online database," accessed various dates. Rice yields often vary between years because of weather and other factors, so six-year average yields are reported to smooth out annual variation.

Figure 2.3 Rice yields, selected countries, average for marketing years 2018/19–2023/24

In metric tons per hectare. Underlying data for this figure can be found in appendix F, table F.4.



Source: USDA, FAS, PSD Online database, accessed December 28, 2024.

Yield differences between countries can be attributed to such factors as irrigation systems, seed variety planted, use of fertilizers and pesticides, and overall crop management, along with water quality and availability, climate, and weather.[63] The type of irrigation system and seed variety planted are particularly influential. Rice yields tend to be lower in regions where rainfed production predominates, such as South Asia (e.g., India and Pakistan), Southeast Asia (e.g., Thailand and Vietnam), and Africa, compared to regions where rice is mainly irrigated, such as East Asia (e.g., China) and the United States. In addition to

[63] Several examples of specific factors that contribute to rice yield performance by major rice producers can be found in the country and regional chapters of this report.

increasing yields, irrigation also lowers year-to-year yield fluctuations compared with production systems with little to no irrigation. Seed varieties and proper crop management also influence yields.

Between MY 2007/08 and MY 2023/24, crop yields steadily increased across all regions except North Africa, where yield fell about 1 percent annually. During this 16-year time frame, the highest annual average yield growth rates were in South America and the Middle East, at about 2 percent. Most notable about the trends since 2007/08 is that the rates of yield growth have declined over time. For example, between periods MY 2007/08–2013/14 and MY 2018/19–2023/24, annual yield growth rates in East Asia fell from 1.1 percent to 0.4 percent, in South Asia from 2.2 percent to 1.7 percent, and in Southeast Asia from 0.7 percent to -0.05 percent. The decline in rice yield growth rates can be attributed to several biological and environmental factors. Many high-yielding rice varieties are now reaching a genetic ceiling or plateau in terms of productivity. In addition, factors such as rising temperatures, more frequent extreme weather events, irregular rainfall patterns, and water shortages cause yields to fall, particularly in regions dependent on irrigation.[64]

Trends in Consumption

Many factors drive regional consumption patterns, including whether rice is a traditional staple food, the income level, and the amount of diet diversification. Trends in global rice consumption can be observed through three measures: aggregate consumption, per capita consumption, and the share that rice consumption contributes to the total caloric intake of the population. Between MY 2018/19 and MY 2023/24, world rice consumption rose from 485.1 million mt to 520.2 million mt, representing growth of roughly 1.4 percent annually (table 2.4).[65] The growth in world rice consumption resulted from the rising global population, which increased by about 0.9 percent annually during this period, and higher apparent per capita consumption, which grew from 63 kilograms (kg) in MY 2018/19 to 65 kg in MY 2023/24 (figure 2.4).[66]

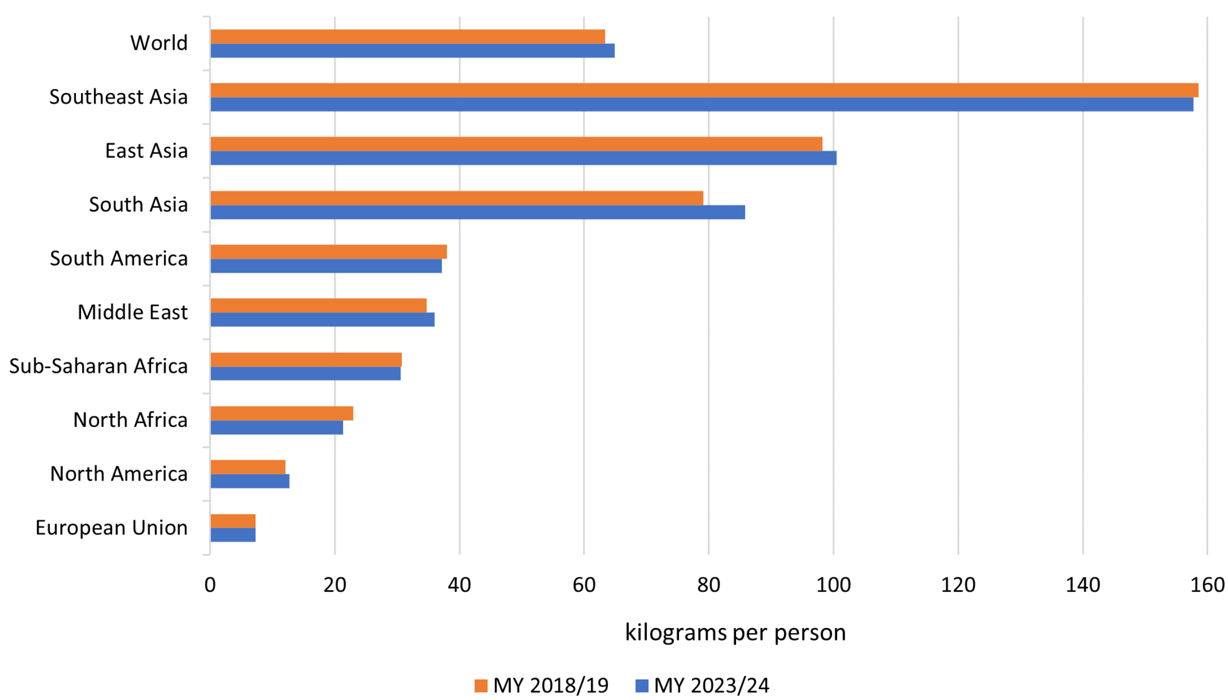
[64] Deng et al., "Closing Yield Gaps for Rice Self-Sufficiency in China," April 12, 2019; Joseph et al., "Modelling Climate Variabilities and Global Rice Production," April 2023.
[65] Consumption data are based on domestic consumption, which includes all rice consumption (e.g., direct food use, processing use, livestock feed, and waste) as well as residuals.
[66] World Bank, "World Bank Data: Population," accessed July 22, 2024; USDA, FAS, "PSD Online database," accessed October 8, 2024.

Table 2.4 Global rice consumption, by region, for marketing years 2018/19–2023/24
In millions of metric tons, by marketing year.

Region	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
South Asia	145.7	149.3	149.8	159.2	163.9	166.2
East Asia	158.9	161.0	165.4	171.4	169.9	163.4
Southeast Asia	102.9	103.7	104.1	104.7	106.1	106.8
Sub-Saharan Africa	33.6	33.9	34.5	36.2	38.2	38.0
South America	14.9	14.7	15.0	14.9	14.8	15.1
Middle East	9.2	9.4	9.2	9.6	9.8	10.2
North America	5.9	6.0	6.2	6.2	6.0	6.4
North Africa	4.6	4.6	4.6	4.4	4.3	4.6
European Union	3.2	3.4	3.4	3.5	3.3	3.3
All other	6.1	6.1	6.1	6.1	6.1	6.2
Total	485.1	492.1	498.4	516.2	522.4	520.2

Source: USDA, FAS, PSD Online database, accessed December 28, 2024.

Figure 2.4 Per capita consumption by region, average for marketing years 2018/19 and 2023/24
In kilograms per capita. MY = marketing years. Underlying data for this figure can be found in appendix F, table F.5.



Source: USDA, FAS, PSD Online database, accessed December 28, 2024; World Bank, "World Bank Data: Population," accessed July 22, 2024.

By all measures of consumption, Asia is by far the world's largest rice-consuming region. The region differs from the rest of the world because rice is the primary staple food for most of the population, especially for the region's low-income consumers. Between MY 2018/19 and MY 2023/24, Asia accounted for 84 percent of global rice consumption, and in MY 2023/24, total rice consumption in Asia was 436.4 million mt, about 7.1 percent higher than in MY 2018/19, because of both increases in population (3 percent) and per capita consumption (4 percent).[67] Asia has the highest per capita rice consumption worldwide, although consumption varies by subregion (figure 2.4). Southeast Asia has by far the highest per capita annual rice consumption at just under 160 kg, with some countries in the subregion, including Cambodia (242 kg) and Vietnam (227 kg), significantly higher. Per capita consumption is about 100 kg in East Asia and about 86 kg in South Asia. Per capita consumption has been flat or falling among many East Asian and Southeast Asian consumers because of a more diversified diet and increasing urbanization. Rice continues to contribute the largest share of calories available to the diet in Asia, at about 24 percent of those available to the population; in Southeast Asia, one of the poorest subregions in Asia, rice makes up more than 40 percent of available calories.[68] This highlights that the availability of and access to rice are critical to food security within Asia.

Africa consumed 42.6 million mt of rice in MY 2023/24, accounting for 8 percent of global consumption (table 2.4). During MY 2018/19–2023/24, Africa's rice consumption grew by about 11.5 percent overall and 2.2 percent annually. Growth occurred mostly in sub-Saharan Africa with consumption stagnant in North Africa, driven by the decline in rice consumption in Egypt.[69] As shown in the map below (figure 2.7), rice imports and consumption within sub-Saharan Africa are concentrated in West Africa. In sub-Saharan Africa, income growth is correlated with an increase in rice consumption, as the rising middle class shifts from traditional staples, such as corn and cassava, to rice and other products.[70] Per capita, rice consumption in Africa rose from 33.6 kg to 36.1 kg between MY 2018/19 and MY 2023/24 (a drop of about 1.4 percent annually). During this period, the share of the average African diet supplied by rice was stable at about 8 percent.[71]

South America accounted for about 3 percent of global rice consumption in MY 2023/24. During MY 2018/19–2023/24, consumption was fairly stable at about 15 million metric tons, although it dropped slightly toward the end of the time period. Brazil, the region's largest rice-consuming country, led the decline in consumption. South American per capita rice consumption was 37 kg annually in MY 2023/24, down by 1 kg from MY 2018/19. In 2022, rice represented 8 percent of calories available for consumption in South America, below the level of the region's main staple food, wheat, which accounted for 13 percent of calories available; meat made up 14 percent and milk 7 percent.[72]

In MY 2023/24, the Middle East consumed 10.2 million mt of rice, or 2 percent of the world's total consumption. Iran and Iraq accounted for about half of the region's rice consumption, followed by Saudi Arabia, the United Arab Emirates, and Turkey. Rice is an important part of the diet in parts of the Middle East (primarily the Levant countries bordering the Mediterranean Sea) but it is not as integral to the regional cuisine as it is in other parts of Asia. In 2022, wheat accounted for 36 percent and rice for 6 percent of the region's daily supply of calories available for consumption.[73]

Both North America and the EU are relatively minor consumers of rice, accounting for 1 percent or less of global consumption during MY 2018/19–2023/24, with per capita consumption in MY 2023/24 at just

[67] USDA, FAS, "PSD Online database," accessed various dates.
[68] FAO, "FAOSTAT: Food Balances," accessed various dates.
[69] USDA, FAS, "PSD Online database," accessed various dates.
[70] USDA, ERS, "SSA Projected Leader in Global Rice Imports," February 2017.
[71] FAO, "FAOSTAT: Food Balances," accessed various dates.
[72] FAO, "FAOSTAT: Food Balances," accessed various dates.
[73] FAO, "FAOSTAT: Food Balances," accessed various dates.

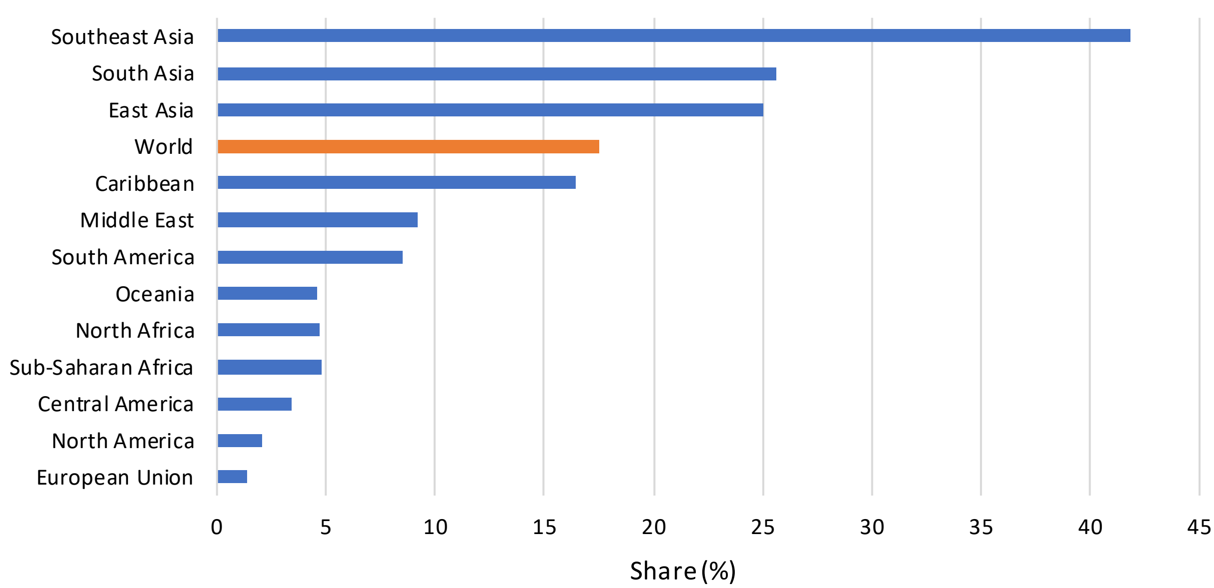
13 kg in North America. In 2022, rice accounted for only 1 percent of daily supply of calories available for consumption in the EU and for 2 percent in North America.[74]

The consumption trends observed during MY 2018/19–2023/24 are similar to those of MY 2007/08–2013/14 reported in the Commission's 2015 rice report. Globally, rice consumption grew at a fairly constant rate throughout the 16-year period at about 1.2 percent annually. However, regional differences were minor. The growth rates in consumption for lower-income regions (e.g., East Asia, Southeast Asia, and Africa) were mostly higher during MY 2007/08–2013/14 compared with the more recent period, MY 2018/19–2023/24; but for certain higher-income regions (e.g., North America), the reverse was true and consumption growth was higher in the later period. The long-term trend in per capita rice consumption was stable between MY 2007/08 and MY 2023/24, ranging from a low of 63.4 kg in MY 2015/16 to a high of 65.7 kilograms in MY 2022/23.[75]

Globally, rice contributed about 17 percent of calories available for consumption per capita during MY 2018–22 (figure 2.5). Shares varied widely across regions, with Asia and Africa being the areas where rice contributed the highest share of calories available for consumption per capita and North America and the European Union contributing the lowest.

Figure 2.5 Share of daily per capita calories available for consumption from rice, by region, average 2018–22

In percentages. Underlying data for this figure can be found in appendix F, table F.6.



Source: FAO, FAOSTAT database, "Food Balances," accessed various dates.

[74] FAO, FAOSTAT database, "Food Balances," accessed various dates.
[75] USDA, FAS, PSD Online database, accessed various dates; World Bank, "World Bank Data: Population," accessed July 22, 2024.

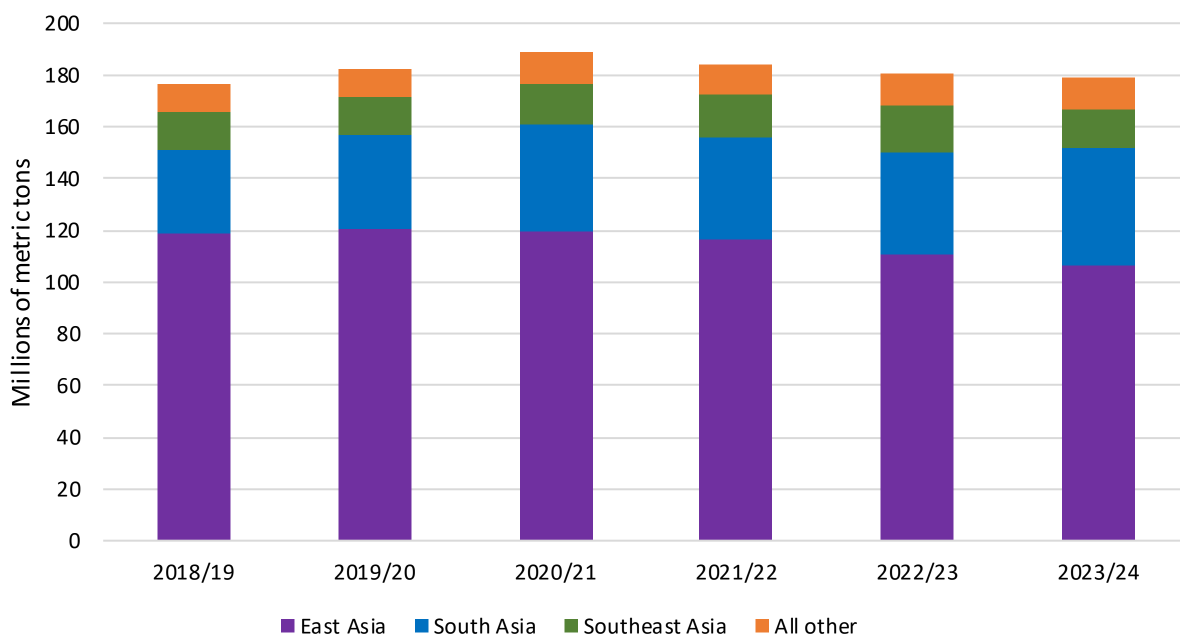
Trends in Ending Stocks

Between MY 2018/19 and MY 2020/21, global rice stocks rose steadily from 177 million mt to a record 189 million mt in MY 2020/21, before dropping in each of the two subsequent marketing years to 179 million mt in MY 2023/24 (figure 2.6).[76] Stock levels during this period represented 34–38 percent of global consumption.

Global rice stocks are highly concentrated in a few Asian countries.[77] In MY 2023/24, 88 percent of global rice stocks were held in Asia, including China (58 percent share) and India (23 percent). Most of the growth in global stocks between MY 2018/19 and MY 2020/21 is attributed to India, with its stocks growing from 29.5 million mt to 42.0 million mt, largely in response to policies that restricted exports of non-basmati rice.[78] Indonesian stocks also grew from 3.1 million mt in MY 2020/21 to 5.7 million mt in MY 2023/24. The drop in global stocks between MY 2020/21 and MY 2023/24 was largely due to the decline in stockholding by China, falling from about 116.5 million mt to 103.0 million mt.

Figure 2.6 Rice ending stocks, by region, for marketing years 2018/19–2023/24

In millions of metric tons, by marketing year. Underlying data for this figure can be found in appendix F, table F.7.



Source: USDA, FAS, PSD Online database, accessed December 28, 2024.

Over the long term, shifts in rice stockholding have been significant based on a comparison of the trends covered for MY 2007/08–2013/14 in the Commission's 2015 rice report and the ones described above. The earlier period saw a sharp rise in global stocks, increasing from 82.3 million mt in MY 2007/08 to

[76] USDA, FAS, PSD Online database, accessed various dates. Based on ending stocks of milled rice.
[77] Between MY 2018/19 and MY 2023/24, Africa and South America each held about 2 percent of global stocks, on average, and North America and the EU each held more than 1 percent. USDA, FAS, "PSD Online database," accessed various dates.
[78] See chapter 5 for information on India's stockholding.

128.7 million mt in MY 2013/14, or close to 7 percent annually. Stocks continued to rise every year until reaching a peak in MY 2020/21 at 188.6 million mt, before dropping every year during MY 2021/22–2023/24. These trends were mostly driven by stockholding behavior in China, a country that held between one-half and two-fifths of global stocks throughout the 16-year period.[79]

Trends in Global Trade

Overview of Global Trade

The global rice market is thinly traded, with exports accounting for only 10 percent of global rice production on average during MY 2018/19–2023/24.[80] By comparison, other grains and oilseeds are more extensively traded, with exports' share of production averaging 44 percent for soybeans, 26 percent for wheat, and 15 percent for corn between MY 2018/19 and MY 2023/24.[81] A major reason rice is less traded than other grains is the high degree of self-sufficiency among major rice-consuming countries. The top five rice-consuming countries imported only about 2.3 percent of consumption between MY 2018/19 and MY 2023/24.[82] Rice is also a highly protected commodity. Governments in many major rice-consuming countries limit imports in attempts to support domestic prices and incomes for domestic rice producers, thereby encouraging domestic production to align with self-sufficiency objectives.[83] Imports and exports in a number of these countries are closely regulated or may even be traded directly by the government. Also, strong consumer demand for specific local rice types and grades results in rice trade being highly segmented by processing level, form, and type.[84]

The international *Harmonized Commodity Description and Coding System* (Harmonized System or HS) for tariffs has subheadings for three types of rice based on processing level and a separate category for broken rice. The quantity of global rice imports by HS subheading ranged varied: 72 percent of global imports were milled white rice (HS 1006.30); 16 percent, broken rice (HS 1006.40); 6 percent, paddy rice (HS 1006.10); and 6 percent, brown rice (HS 1006.20) during MY 2018–22.[85] White rice was the leading form of traded rice because of consumer preferences and government policies that discourage or even prohibit paddy rice exports in order to keep the employment required by and income received from domestic milling. By grain length, about 65 percent of global rice trade is long grain rice (excluding aromatic), just under 10 percent is medium and short grain rice combined, and about 25 percent is aromatic rice.[86] These shares are in line with global consumption, which favors long grain rice. In addition to processing level and grain length, trade is also segmented by characteristic. Consumers in

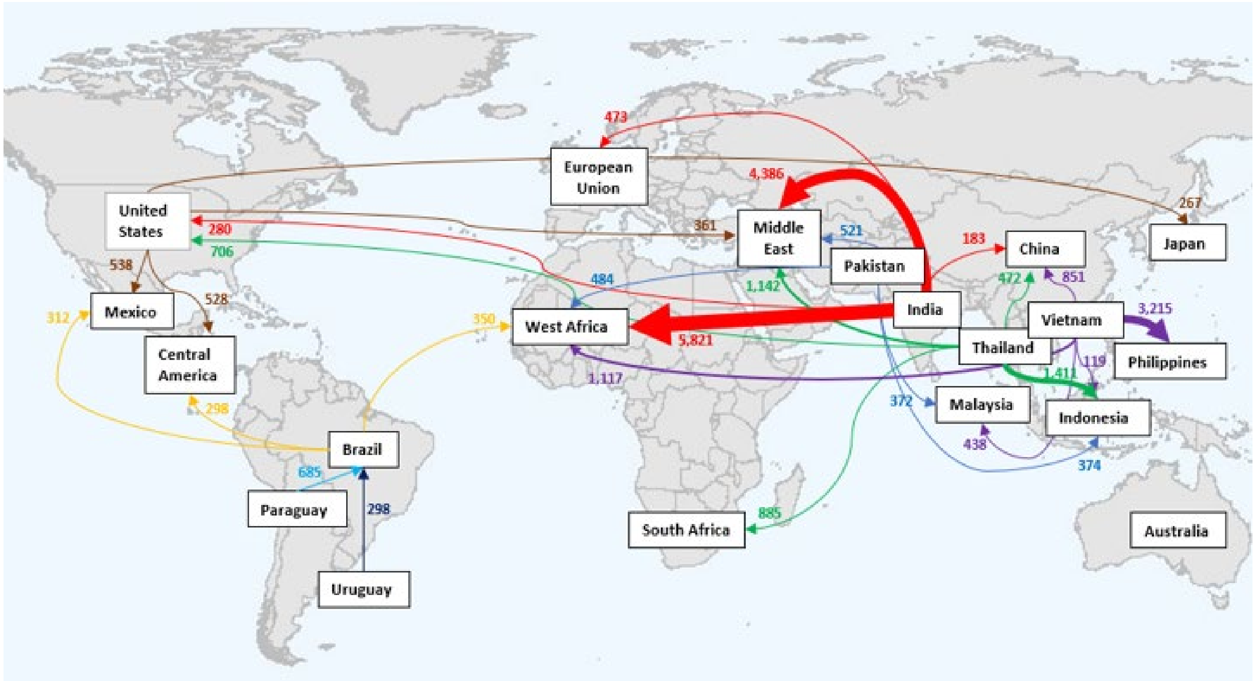
[79] USDA, FAS, PSD Online database, accessed December 28, 2024.
[80] USDA, FAS, PSD Online database, accessed December 28, 2024.
[81] USDA, FAS, PSD Online database, accessed December 28, 2024.
[82] The five leading rice-consuming countries by total quantity during MY 2018/19–2023/24 were China, India, Bangladesh, Indonesia, and Vietnam. USDA, FAS, PSD Online database, accessed December 28, 2024.
[83] FAO, *Food Outlook*, June 2020.
[84] FAO, "FAO Rice Price Update," accessed various dates.
[85] S&P Global, GTAS database, Imports, HS heading 1006, rice, accessed August 2, 2024.
[86] USDA, ERS, "Rice Sector at a Glance," September 27, 2023; Durand-Morat and Bairagi, *International Rice Outlook: International Rice Baseline Projections 2020–2030*, August 2021.

some countries prefer parboiled long grain rice, but others prefer aromatic rice, which commands a premium price.

Volumes of rice that are traded are small relative to overall production, but a large number of countries and regions export and import rice (figure 2.7). South Asia and Southeast Asia are the top exporting regions. Several significant exporting countries are in North America and South America. During MY 2018–23, South Asian exporters (India and Pakistan) primarily shipped milled white rice to the Middle East and West Africa. Intraregional exports to other South Asian countries, as well as shipments of high-quality long grain white and aromatic rice to the EU and North America, were also significant. Southeast Asian exporters (Burma, Cambodia, Thailand, and Vietnam) shipped mostly within the Southeast Asian region and to West Africa, East Asia, and the Middle East.

Figure 2.7 Major global rice trade flows, 2023

In thousands of metric tons. Underlying data for this figure can be found in appendix F, table F.8.



Source: S&P Global, Total exports, HS heading 1006, rice, accessed August 2, 2024.

Exports from North America (mostly originating from the United States) and South America (mostly originating from Brazil and Uruguay) had diverse destinations, including North America, Central America, South America, West Africa, the Middle East, and East Asia. The factors that determine these trade flows—most importantly competitive pricing, logistics advantages, and meeting consumer preferences—are discussed broadly in chapter 3 and more specifically in the country and regional chapters (chapters 4–8) and for the United States, in chapter 9.

Global rice imports are dispersed across many countries, with the top 10 importers receiving less than 40 percent of annual global imports between 2018 and 2023.[87] West Africa, the Middle East, and East Asia were the top importing regions (figure 2.7). As noted, consumption outpaced production in West Africa and the Middle East, increasing imports. In East Asia, government policies largely determined import amounts because China, Japan, South Korea, and Taiwan use TRQs to manage their rice markets. North America, Southeast Asia, South America, and the EU were also significant trading markets; although, except for the EU, a large portion of imports originated from countries within the same region.

Global trade increased between 2018 and 2023, with export volumes growing by 14 percent, from 47.9 million mt to 54.6 million mt.[88] Rising prices pushed export values even higher, by about one-quarter, from $25.6 billion to $32.2 billion. The expansion of trade reflects higher global rice consumption within rice-deficit countries, prompted by population and income growth, especially in low-income countries.

[87] FAO, "FAOSTAT: Trade," accessed November 4, 2024.
[88] Calculated by USITC based on data from FAO, "FAOSTAT: Trade," accessed November 4, 2024; USDA, FAS, PSD Online database, accessed October 8, 2024; S&P Global, HS heading 1006, rice, accessed various dates.

At the same time, production in exporting countries expanded and export values rose more than quantity because of a 9 percent increase in rice prices.

Global Export Trends

Global rice exports trended upward during 2018–23 (tables 2.5 and 2.6). During that period, export quantities grew 3.4 percent annually, although they trended down between 2018 and 2019, before increasing to reach a record high of 58.3 million mt in 2022. These trends largely tracked the exports of India and Thailand, the top two exporting countries. For example, the drop between 2018 and 2019 was largely due to lower exports by Thailand that fell by almost half from 11.2 million mt to 7.6 million mt. This fall was caused in large part by severe drought in northern and central Thailand, which lowered its dry season production resulting in less long grain white rice available for exports.[89]

Table 2.5 Global rice export volumes by country, annually by volume, 2018–23
In thousands of metric tons.

Trade partner	2018	2019	2020	2021	2022	2023
India	12,006	9,892	14,716	21,477	22,247	17,860
Thailand	11,232	7,584	5,733	6,266	7,695	8,748
Vietnam	2,892	5,467	5,633	5,712	6,564	6,892
Pakistan	3,932	4,589	3,986	3,991	4,604	4,560
United States	3,191	3,642	3,292	3,411	2,489	2,753
China	1,321	2,747	2,304	2,448	2,215	1,626
Burma	2,750	2,700	2,300	1,900	2,335	1,577
Brazil	1,459	1,063	1,401	854	1,731	1,454
Uruguay	829	872	1,032	761	1,096	1,108
Paraguay	707	738	903	693	824	911
Cambodia	441	555	654	635	642	648
All other	4,261	4,620	5,714	5,466	5,917	5,154
Total	45,020	44,469	47,667	53,615	58,358	53,289

Source: S&P Global, Total exports, HS heading 1006, rice, accessed January 7, 2025.
Note: Burma export data were calculated by aggregating imports from Burma as reported by all other countries.

[89] USDA, FAS, *Drought Update*, May 20, 2020; USDA, FAS, *Commodity Intelligence Report*, October 1, 2021.

Table 2.6 Global rice export values by country, annually by value, 2018–23
In millions of dollars.

Trade partner	2018	2019	2020	2021	2022	2023
India	7,544	6,835	7,987	9,693	10,779	10,466
Thailand	5,634	4,200	3,703	3,408	3,940	5,101
Vietnam	2,621	2,434	2,791	3,006	3,193	3,685
Pakistan	2,013	2,284	2,105	2,144	2,371	2,856
United States	1,691	1,867	1,878	1,952	1,713	2,045
China	887	1,059	916	1,036	1,034	985
Burma	388	717	791	594	877	761
Brazil	467	368	504	359	656	621
Uruguay	394	361	463	383	495	595
Paraguay	219	227	295	274	293	415
Cambodia	411	421	471	422	416	474
All other	3,864	3,325	4,078	3,980	4,479	4,591
Total	26,132	24,098	25,981	27,251	30,247	32,596

Source: S&P Global, Total exports, HS heading 1006, rice, accessed January 7, 2025.
Note: Burma export data were calculated by aggregating imports from Burma as reported by all other countries.

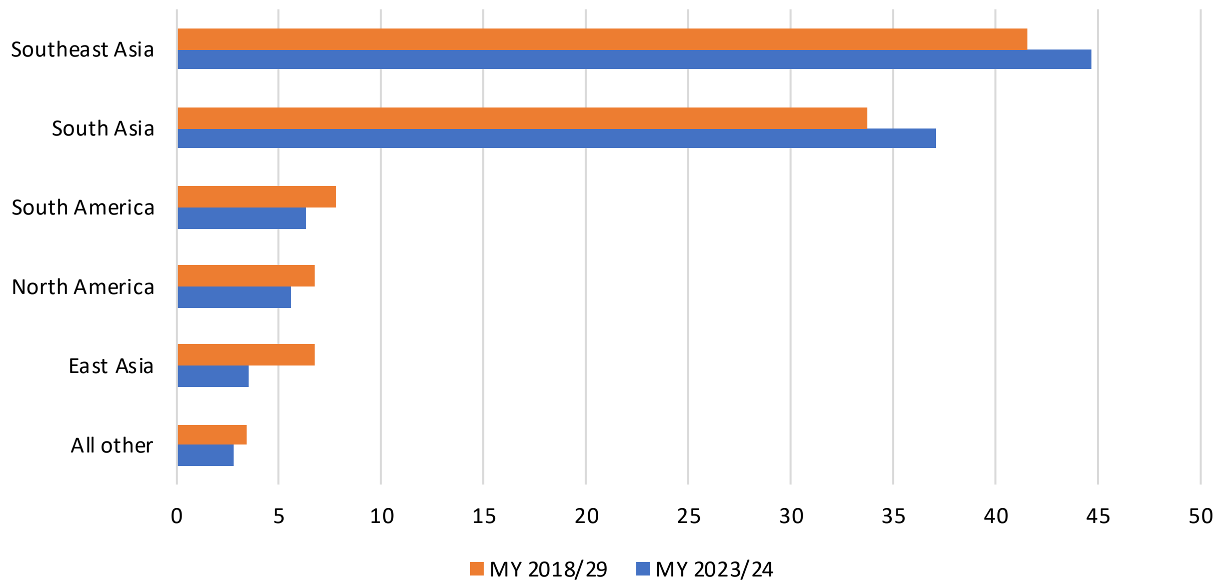
The sharp rise in exports between 2020 and 2021 can be largely attributed to India, with its exports increasing almost 50 percent from 14.7 million mt to 22.2 million mt consisting mostly of parboiled, long grain white, and broken rice. Between 2020 and 2022, West Africa had strong demand for parboiled rice, long grain rice, and broken rice. The region faced production and import supply shortages for other cereals, exacerbated by supply chain disruptions after the Russian invasion of Ukraine.[90] Furthermore, in 2021 and 2022, China had strong demand for broken rice owing to higher prices of other feed crops (e.g., corn) and its increased rice demand for industrial uses.[91] Growth in exports from Vietnam was steady over this time period. The value of global rice exports during 2018–23 followed a similar pattern as export quantity trends, with the exception that export values rose to record high levels in 2023, largely as a result of the 20 percent increase in international rice prices that year.[92]

Between MY 2018/19 and MY 2023/24, global rice exports were highly concentrated in Asia, with market shares shifting among exporting regions (figure 2.8). In both MY 2018/19 and MY 2023/24, as well as during the intervening years, more than 80 percent of exports were from Asia (primarily Southeast Asia and South Asia), largely because the majority of rice is produced there. Between MY 2018/19 and MY 2023/24, Southeast Asia was the world's largest exporting region, with four of the world's leading exporters: Thailand, Vietnam, Burma, and Cambodia. In that period, the shares of Southeast Asia and South Asia grew at the expense of all other regions. Outside Asia, most global exports are from the Americas. North America and South America, combined, made up 15 percent of exports in MY 2018/19 and 12 percent in MY 2023/24.

[90] The Russian invasion of Ukraine led to a significant decrease in wheat availability for six West African countries that import between 30 and 50 percent of their wheat from Russia and Ukraine. Oxfam International, "West Africa Faces Its Worst Food Crisis in Ten Years," April 4, 2022; WFP, "Worsening Hunger Grips West and Central Africa," April 12, 2024; The Africa Center for Strategic Studies, "Conflict Remains the Dominant Driver of Africa's Food Crisis," October 16, 2023.
[91] USDA, FAS, *Senegal: Grain and Feed Annual 2022*, April 26, 2022, 6; Storey, "Chinese Rice Imports Soar as Exports Hold Steady on Year," October 21, 2021.
[92] FAO, *Food Outlook*, June 2020.

Figure 2.8 Regional share of global rice exports in marketing years 2018/19 and 2023/24

In percentages, by marketing year (MY). Underlying data for this figure can be found in appendix F, table F.9.



Source: USDA, FAS, PSD Online database, accessed December 27, 2024.

Global Import Trends

Countries rely on imports to meet consumer demand for a variety of possible reasons; for example, (1) they are not major rice producers but are important consumers (e.g., the Philippines); (2) rice consumption is growing faster than rice production (e.g., Indonesia and Malaysia); (3) they are major rice producers and consumers that face occasional production shortfalls (e.g., China); or (4) they have trade obligations for a minimum quantity of imports (e.g., Japan).

Global import quantities dipped slightly between 2018 and 2019, largely as a result of the lower quantity of imports by China and Indonesia (tables 2.7 and 2.8). But during 2020–22, imports increased by about one-third to reach a record 55.8 million mt in 2022, with higher imports by most of the major importing countries. While import values also trended upward, their growth differed from quantity growth because of large fluctuations in global rice prices.

Table 2.7 Global imports of rice, annually by volume, 2018–23
In thousands of metric tons.

Trade partner	2018	2019	2020	2021	2022	2023
Philippines	1,784	2,768	2,087	2,952	3,868	3,611
Indonesia	2,251	445	356	408	429	3,063
China	3,035	2,504	2,911	4,926	6,159	2,598
Iraq	974	1,301	1,000	1,318	2,126	1,844
Benin	2,511	1,928	1,642	1,731	2,032	1,714
Saudi Arabia	1,306	1,403	1,547	1,150	1,291	1,492
Malaysia	808	969	1,220	1,154	1,242	1,408
United States	896	964	1,188	957	1,296	1,338
Côte d'Ivoire	1,497	1,342	1,113	1,443	1,562	1,307
Senegal	997	957	1,053	1,232	1,487	1,302
South Africa	1,075	967	1,032	1,005	1,039	1,223
All other	22,955	23,402	26,972	31,249	33,304	30,151
Total	40,089	38,950	42,122	49,525	55,835	51,051

Source: S&P Global, General imports, HS heading 1006, rice, accessed January 7, 2025.

Table 2.8 Global imports of rice, annually by value, 2018–23
In millions of dollars.

Trade partner	2018	2019	2020	2021	2022	2023
Philippines	696	951	822	1,131	1,213	1,583
Indonesia	1,036	184	195	184	202	1,789
China	1,600	1,254	1,459	2,188	2,622	1,408
Iraq	702	856	688	827	1,103	1,350
Benin	974	736	647	645	724	673
Saudi Arabia	1,328	1,413	1,402	1,060	1,338	1,626
Malaysia	407	453	587	575	608	812
United States	903	1,014	1,187	876	1,158	1,308
Côte d'Ivoire	689	604	560	726	805	722
Senegal	373	351	396	495	601	490
South Africa	519	448	541	504	475	632
All other	14,830	13,518	15,041	16,517	19,563	18,976
Total	24,056	21,782	23,524	25,730	30,412	31,369

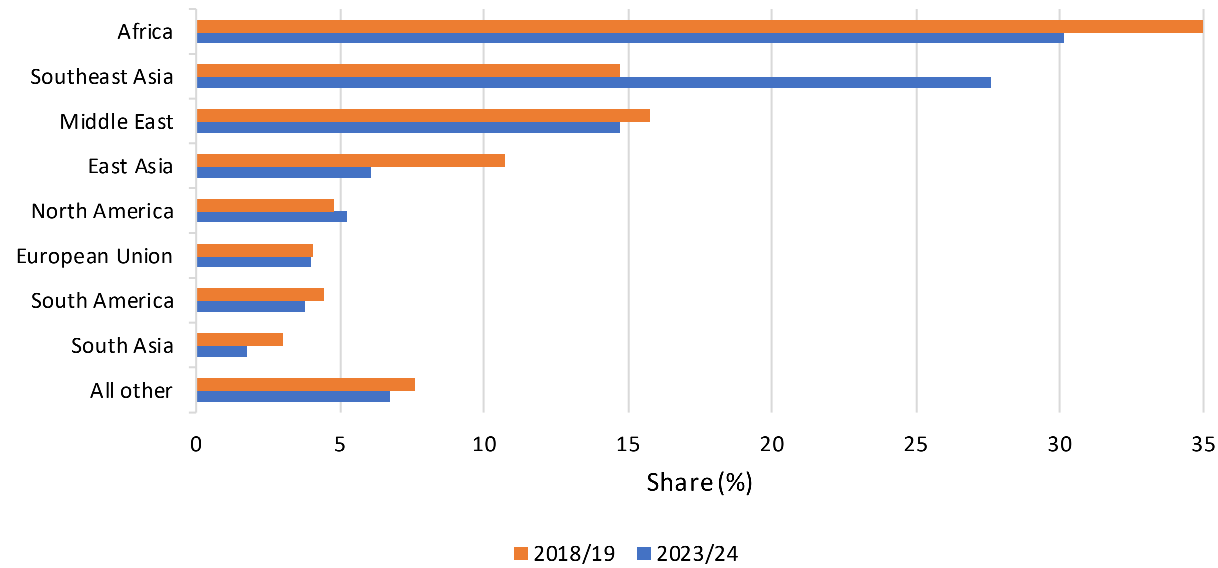
Source: S&P Global, General imports, HS heading 1006, rice, accessed January 7, 2025.

Unlike global rice exports, which have a high level of regional supplier concentration, imports are widely dispersed among regions and countries. The top 10 importing countries received about 40 percent of global imports during MY 2018/19–2023/24.[93] The leading importing regions were Africa, Southeast Asia, the Middle East, and East Asia (figure 2.9). Other regions, including North America, South America, and the EU, each received 5 percent or less of global imports. Between MY 2018/19 and MY 2023/24, changes in global rice imports shares occurred for Africa, Southeast Asia, and East Asia, but other regional shares were more stable (figure 2.9).[94]

[93] USDA, FAS, "PSD Online Database," accessed December 27, 2024.
[94] USDA, FAS, "PSD Online Database," accessed December 27, 2024.

Figure 2.9 Regional share of global rice imports in marketing years 2018/19 and 2023/24

In percentages, by marketing year. Underlying data for this figure can be found in appendix F, table F.10.



Source: USDA, FAS, PSD Online database, accessed December 27, 2024.

Africa was the top rice-importing region in the world with a global import share of about one-third during MY 2018/19–2023/24. Imports made up a large portion of rice consumption in this rice-deficit region. Nigeria was the region's largest importer and accounted for 30–40 percent of rice imports into this region between MY 2018/19 and MY 2023/24. Other major importing countries in the region were Senegal, Côte d'Ivoire, and Ghana.[95] Nearly 90 percent of Africa's imports were sourced from South Asian or Southeast Asian countries. In addition to being the world's largest rice-exporting region, Southeast Asia was also a significant importer between MY 2018/19 and MY 2023/24 (figure 2.9). The majority of Southeast Asian imports were from exporters within the region, such as Thailand and Vietnam.[96] Between MY 2018/19 and MY 2023/24, the Middle East was one of the world's top three importing regions.[97] Its share of world imports fluctuated between 13 percent and 17 percent. The major importers in the Middle East were Iran, Iraq, and Saudi Arabia. Over 80 percent of Middle Eastern imports originated from South Asian and Southeast Asian countries, with most of the remainder supplied by North America and South America.[98] Between MY 2018/19 and MY 2023/24, East Asia's share of global rice imports fell primarily because of the rapid drop in Chinese imports.[99]

Trends in Global Rice Prices

Rice is a highly heterogeneous commodity, with trade fragmented by consumer preferences, including for processing level, variety, grain length, quality, and source. Because the majority of the world's traded

[95] USDA, FAS, PSD Online database, accessed December 27, 2024.
[96] During MY 2018–23, Southeast Asia imported 90 percent of its rice from Southeast Asian exporters.
[97] USDA, FAS, PSD Online database, accessed December 27, 2024.
[98] USDA, FAS, PSD Online database, accessed December 27, 2024.
[99] USDA, FAS, PSD Online database, accessed December 27, 2024.

rice is long grain white rice, most export price quotes are for this type of rice.[100] But even for long grain white rice, price trends in the high-quality segment (e.g., with a lower content of broken rice) differ from those in the low-quality segment (with a higher broken rice content). Moreover, aromatic, medium grain, and paddy rice are considered separate market segments, with pricing dynamics and trends that differ from long grain rice.[101]

International prices are available for four major rice types: indica (a type of long grain), aromatic (including jasmine and basmati), japonica (a type of medium or short grain), and glutinous.[102] Indica rice, grown in tropical and subtropical regions—such as India, Pakistan, Thailand, Vietnam, Burma, Cambodia, the Philippines, Indonesia, Malaysia, southern China, Brazil, and the southern United States—accounts for about two-thirds of global trade.[103] It is typically long grain and not sticky when cooked. Aromatic rice includes jasmine and basmati rice and is characterized by a nutty or popcorn-like aroma. It is primarily produced in Thailand, Vietnam, Cambodia, India, and Pakistan and makes up about one-quarter of the global trade.[104] Japonica rice is grown in regions with more temperate cooler climates—such as Japan, North Korea, South Korea, certain regions of China, California, the EU, Russia, Australia, and Egypt—and makes up about 10 percent of global trade. Japonica rice is typically short or medium grain, and many varieties are more rounded and tend to stick together when cooked.[105] Glutinous and other specialty rice types contribute less than 3 percent to global trade and are primarily from Thailand, Vietnam, Cambodia, and Laos. Glutinous rice is sticky or sweet and is frequently used in desserts.[106]

Overall, prices for all rice categories during this period were volatile, especially for japonica and glutinous rice. Many of the price movements observed can be associated with unanticipated changes in global supply, such as weather-related supply shocks (e.g., El Niño), as well as demand, such as government purchases to build up emergency stocks as a response to natural disasters or geopolitical events.[107] Several countries have enacted a variety of policies with the explicit goal of becoming more self-sufficient and stabilizing rice prices and supplies for their domestic consumers, producers, or both. Although these actions sometimes succeed in keeping domestic prices stable, they often do so by shifting price volatility to the world market because the policies prevent or discourage rice supplies from profiting from higher prices abroad.[108] In some cases, price volatility in rice-consuming countries can be associated with changes in currency valuations in the major exporting countries, such as the value of the Thai baht and Vietnamese dong vis-à-vis the U.S. dollar. Volatility in rice prices can also be attributed to the inelasticity of consumer demand when relatively small changes in available supplies give rise to large changes in prices.

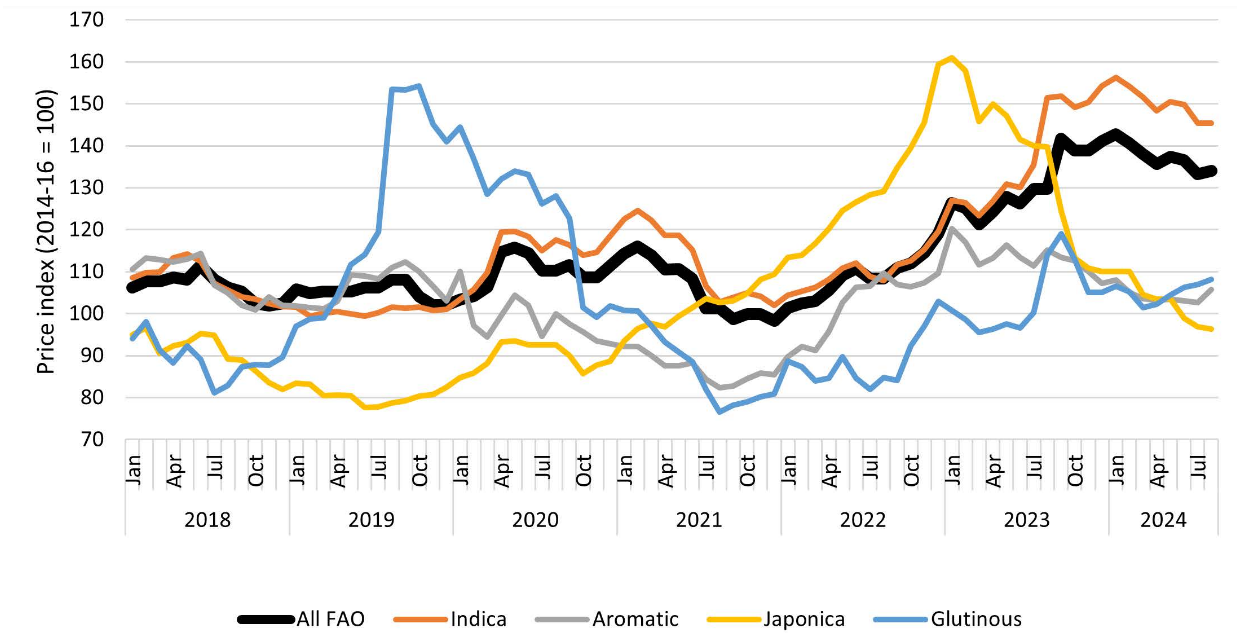
Specific price movements in international rice prices between 2018 and 2024 are shown in figure 2.10. In 2018, prices generally fell owing to weakening demand for imports by several Asian and African

[100] FAO, "FAO Rice Price Update," accessed various dates.
[101] IRRI, "Price Production Course: Rice Races," accessed December 14, 2024.
[102] FAO, "FPMA Tool," accessed October 2, 2024.
[103] USDA, ERS, "Rice Sector at a Glance," accessed November 6, 2024.
[104] USDA, ERS, "Rice Sector at a Glance," accessed November 6, 2024.
[105] USDA, ERS, "Rice Sector at a Glance," accessed November 6, 2024.
[106] USDA, ERS, "Rice Sector at a Glance," accessed November 6, 2024.
[107] OECD, *The Economic Effects of Public Stockholding Policies for Rice in Asia*, October 18, 2018, 8.
[108] Martin et al., "Trade Policy and Food Price Volatility," June 7, 2024.

countries coupled with currency depreciations against the dollar in some leading export markets.[109] In 2019, prices for indica remained flat because of weak demand by key purchasers such as Bangladesh, China, Indonesia, and Nigeria. However, prices started to strengthen in response to increased demand for medium and short grain rice from importers in Asia.[110]

Figure 2.10 Food and Agriculture Organization of the United Nations (FAO) rice prices indexes, 2018–24.

Price index (2014–16) = 100. Underlying data for this figure can be found in appendix F, table F.1.



Source: FAO, "FAO Rice Price Update," accessed September 5, 2024.
Note: The All FAO index is based on 21 rice export quotes. The Indica index is based on the following prices: Argentina 5%, Brazil 5%, India parboiled 5%, Pakistan 5%, Thai 100% B white, Thai parboiled 100%, Uruguay 5% (long grain white rice), U.S. #2 4% (long grain white rice), Pakistan 25%, Thai 25%, Thai 1A Super (white broken rice), Pakistan 25%. The percentages in the rice type names generally refer to the percentage of broken kernels, except for Thai 100% B, which is a Thai grade of long grain white rice with less than 5% broken kernels. The aromatic index is based on the following prices: Cambodia fragrant 5%, India Pusa basmati, Pakistani basmati, Thai fragrant (Hom Mali jasmine rice, grade A), Vietnam fragrant. The japonica index is based on the following prices: U.S. medium grain #1 4% (California Calrose). The glutinous index is based on the following prices: Thai glutinous 10%, Vietnam glutinous 10%. Within each variety's index, a simple average of the relative quote prices is calculated, then the average relative prices of each of the varieties are combined by weighing them with their trade shares to arrive at the All FAO Index.

In 2020, prices were heavily impacted by the COVID-19 pandemic. Pandemic-related restrictions were partly a reason for elevated prices as shortages of containers and workers led to higher transportation costs.[111] The sudden increases in domestic demand, as various suppliers entered pandemic-related lockdowns, compounded the price rise in March, as did temporary export restrictions in some exporting countries, most notably Vietnam. As these measures coincided with a considerable slowdown of Indian shipments caused by logistical bottlenecks, the supply constraints spurred a rapid rise in prices. These

[109] FAO, *Food Outlook*, November 2018.
[110] FAO, *Food Outlook*, May 2019.
[111] USA Rice Federation, "March FAO Rice Price Report Shows Higher Global Prices in 2021," March 29, 2021.

export restrictions proved short-lived, nevertheless, and were eased, if not fully repealed, by May 2020.[112]

In 2021, prices declined sharply owing to a slowdown in demand, in tandem with new crop arrivals and currency movements. Prices fell particularly for aromatic and glutinous rice, because of increased production in major exporting countries, as well as weak demand, especially for basmati rice from Middle East and North African buyers. Also, limited irrigation water in California led to increased japonica prices starting in early 2021. Prices fell for indica rice because of fresh crops in Thailand and Vietnam, as well as currency movements, and efforts by traders to attract new sales that were held back as a result of container shortages and sharply higher shipping costs that did not fully abate until 2022. U.S. rice prices increased in 2021 despite expectations of farmers in the U.S. Mississippi Delta region that prices would decline, which prompted shifts to cultivation of more profitable crops, such as corn and soybeans.[113]

Prices rose in 2022, most notably for japonica and aromatic rice, in response to strong import demand and supply constraints in the japonica and fragrant sectors. However, increases were moderated by abundant supplies of indica rice from Asia.[114] In the indica segment, Thai and Vietnamese prices rose in 2022, owing to demand growth. Expectations of consecutive output declines in the United States and of drought-induced declines in Argentina and Brazil also caused prices to rise. As described in chapter 3, Russia's invasion of Ukraine also contributed to higher prices in 2022 by making agricultural inputs and shipping more expensive.

Prices increased for most of 2022 and continued to rise in 2023 because of strong demand from buyers in Asia and production disruptions. On the demand side, prices were supported by strong buying in Asia, often resulting from public efforts to keep domestic prices in check or to build up stocks. On the supply side, poor weather and higher production costs created disruptions in MY 2022/23. Concerns over the potential production impact of the emergence of an El Niño phenomenon tended to add to stronger prices. In mid-2023, japonica rice prices fell because of low demand and the arrival of freshly harvested supplies in Vietnam coupled with expectations of a rebound in production in California. Glutinous rice prices also fell at the end of the year owing to weak demand, especially in China.[115] International rice prices rose in 2023 as a result of tighter export restrictions by India, as well as concerns over the impacts of El Niño on production. However, export prices fell toward the end of 2023, influenced by a weakening import demand, the arrival of freshly harvested supplies, and currency depreciations against the U.S. dollar in some exporting countries in Asia.[116] In the first six months of 2024, prices for all rice types fell. This was in large part due to strong supply and low demand from African buyers, as well as the weakness of the Thai baht and Vietnamese dong against the U.S. dollar. Indica price fell less sharply both because of large purchases by Southeast Asian buyers, most notably Indonesia, and the continued effects of India's rice export restrictions on international prices.

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[112] FAO, *Food Outlook*, June 2020.
[113] FAO, *Food Outlook*, June 2021.
[114] FAO, *Food Outlook*, June 2022.
[115] FAO, *Food Outlook*, June 2023.
[116] Because global rice prices are typically denominated in U.S. dollars, a weaker currency in the exporting country relative to the dollar translates into lower prices. FAO, *Food Outlook*, November 2023.

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Chapter 3
Comparisons of Competitiveness Across Rice-Exporting Countries

This chapter provides an overview of the elements of competitiveness for rice producers, as well as some of the available measures to compare producers on these elements. It also presents a summary of how government policies are used by rice-producing countries to bolster competitiveness. This information supplements the competitive strengths and weaknesses of individual countries that are presented in chapters 4–7. The countries covered in this chapter are primarily the major rice-exporting countries, which are Brazil, China, India, Pakistan, Paraguay, Thailand, the United States, Uruguay, and Vietnam. The chapter also makes occasional reference to Bangladesh and Indonesia, the two countries profiled in the report that are major rice producers but not major exporters.

Broadly, competitiveness depends on a supplier's ability to provide products with the characteristics sought by buyers, at a price those buyers are willing to pay. For rice producers, desired characteristics vary by market and consumer group. For example, preferred types of rice are highly specific by country, with some countries preferring long grain rice and others preferring medium grain. Desired characteristics also vary for different types of buyers within a country. Buyers in the market for food ingredients, for example, value different characteristics than buyers purchasing rice for direct food use. Regardless of the type of rice sought, however, three main criteria affect purchase decisions in agricultural markets (including rice): delivered cost, product differentiation, and reliability of supply.[117]

The delivered cost of rice reflects the cost of production on the farm (that is, the cost to produce paddy rice), milling and transportation costs, import compliance costs, and tariffs imposed by the importing country. Exchange rates also affect delivered cost. Indicators of competitiveness pertaining to delivered cost include not only the direct and indirect costs associated with farming (e.g., seeds, water, chemical inputs, land, taxes, and labor) but also crop yields affecting the per-unit cost of producing rice and the efficiency of the milling and transportation sectors. When cost data are not available, price comparisons can shed light on relative cost differences between countries.

Product differentiation concerns the attributes of the rice offered to buyers. Attributes may include the rice variety (e.g., aromatic rice or rice of a certain grain length), markers of quality such as cooking properties or percentage of broken rice included in the final product, consumer preferences such as organic certifications, and intangible factors such as national or brand reputation affecting consumer perceptions of the rice. Measures of countries' competitiveness that relate to product differentiation

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[117] Interviews with industry representatives conducted for this report, cited throughout the "factors affecting competitiveness" sections of the country profiles, confirmed the applicability of these criteria to rice markets. To analyze the competitive factors affecting global rice industries, the Commission used a framework that draws together various aspects of the competitive conditions in food and agricultural trade. This framework draws on Michael Porter's theory of competitive advantage as a starting point from which to analyze competitive conditions affecting trade in agricultural products. For more information on this framework and its limitations, see USITC, *China's Agricultural Trade*, March 2011, E-3 to 3-8; Porter, *Competitive Strategy*, 1980 and Porter, *Competitive Advantage*, 1985.

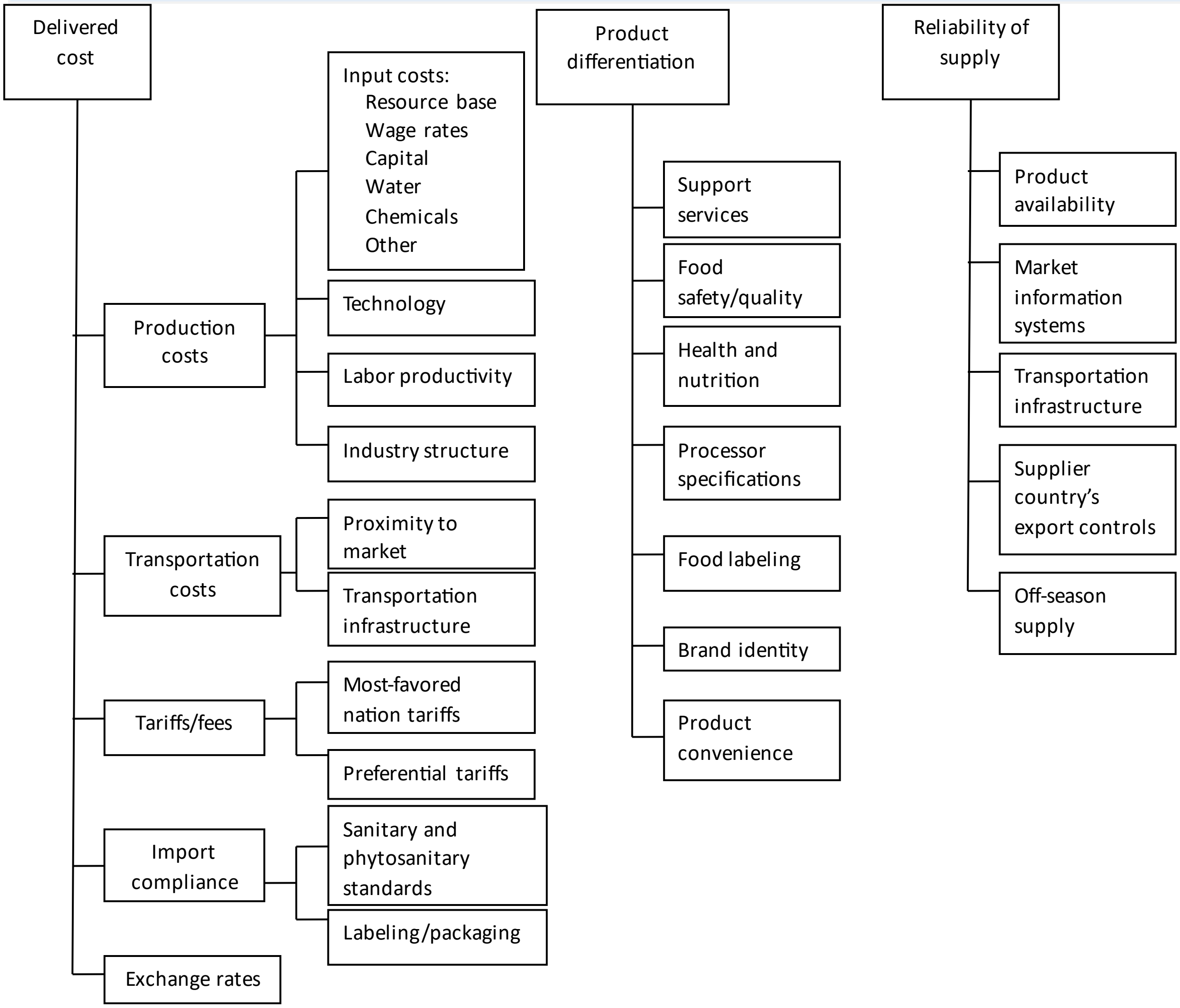
include the product mix offered as well as the milling yield; the latter is affected by the quality of the crop received and the extent to which advanced milling equipment is available in a country. As described in additional detail below, poor milling yields can indicate quality problems with rice, such as improper postharvest handling or kernels that are prone to breakage because of growing conditions.

Reliability of supply refers to the ability of a supplier to deliver a given product to a specific location at a contracted time; it often depends on efficient supply chains and well-functioning market information systems. Policies that restrict exports can harm a supplier's reliability, as can climate-related disasters or other unexpected events that disrupt production or transportation. Measures of reliability of supply that can be used to evaluate countries' competitiveness include the export-to-production ratio and the amount of variability in production and export levels. The presence or absence of export restrictions can also affect reliability of supply, but the extent of the effect likely varies depending on the duration and frequency of the restrictions and the importance of the supplier in the market.

As shown in figure 3.1, cost of production, product differentiation, and reliability of supply each has many components that affect an exporter's overall ability to compete in that dimension. External disruptions such as global input price spikes, shipping disruptions, or natural disasters can affect a country's overall production and export performance along one or more of these dimensions, as described below.

Although government policies are not a separate competitive factor in and of themselves, they may affect any of the measures described above. For example, input subsidies lower the cost to the farmer of producing rice, and consumer price supports increase the likelihood that rice will stay within a country's borders. Governments may also fund research to aid in the development of new rice varieties; they may also invest in programs to differentiate and promote the country's rice in export markets. Government policies also have indirect effects. For instance, efficient transportation of rice relies on government investment in infrastructure. Because the rice industry is one in which the government is heavily involved in many producing countries, this chapter also includes a comparison of government support levels across countries.

Figure 3.1 Competitive factors in agricultural markets



Source: Compiled by the USITC

Delivered Cost

Delivered cost is an important criterion in purchasing decisions, particularly for agricultural commodities such as rice. For some buyers, delivered cost is the most important consideration. To be competitive, suppliers must be able to offer rice to purchasers at prices that are comparable to (or below) the prices offered by other domestic and foreign producers. The price a supplier can offer in any particular market depends on the cost to produce rice and ship it to that destination.

The cost of producing rice depends on the costs of inputs, including materials, machinery, and labor. Material costs include seed, fertilizer, chemical inputs (e.g., pesticides and insecticides), water, and fuel. The cost of production also includes the cost of land (commonly measured as the rental cost for leased land or the opportunity cost for owned land). As described below, systems of production for rice vary in the extent to which they rely on labor or mechanization to perform tasks such as agrichemical application and harvesting, but all rice farms require some amount of labor and some amount of machinery. Other costs include electricity and land. At the milling stage, the costs of producing rice include the cost to procure paddy rice from farmers, electricity, packaging, labor, and depreciation of mill equipment. The efficiency of milling machinery also affects the delivered cost for milled rice. Transportation costs throughout the supply chain add to the final delivered cost of rice and may vary widely by end market, since they depend on external factors, including fuel costs and the efficiency of the transportation system.

Additional expenses affect the overall delivered cost to export markets. These include the costs of currency conversion and tariffs, if applicable. The delivered cost of exported goods also includes spending to meet regulatory requirements, such as complying with phytosanitary standards, and labeling and packaging requirements.

Cost of Production on Rice Farms

Data are available that permit certain comparisons of the cost of rice farming across countries (tables 3.1–3.3). Although these data are not necessarily directly comparable in how they measure costs, nor are they always available for the same years for each country, they allow for some broad analysis. All the data in the tables reflect the cost of producing paddy rice, and all include measures of the on-farm costs of materials, machinery, labor, irrigation, and land. In general, the lowest costs of production are found on rice farms in India, Pakistan, and Vietnam. Higher costs of production are found in the United States, Brazil, and some non-export-oriented countries such as China and Indonesia.

In South Asia, the governments of India, Pakistan, and Bangladesh regularly report costs of production data for rice farms (table 3.1). For Pakistan, these data permit a comparison of the costs of growing basmati and non-basmati rice, with the cost of basmati production about 32 percent higher than the cost of non-basmati production in the same state (Punjab). This reinforces the importance of price premiums that allow farmers who grow basmati rice to recover their higher costs of production.

Governments in Uruguay, Brazil, and the United States also have recent data available on the cost of rice farming in those countries (table 3.2). For the United States, data are available by region. The cost of production is significantly higher in California than elsewhere in the United States, or in any other growing region shown in tables 3.1–3.3. This reflects the high costs of many inputs in California, including land, water, and labor.

Table 3.1 Costs of production in South Asia: total, labor, and labor share by country, data for most recent growing season available
In reporting year, U.S. dollars per metric ton (USD per mt), and percentages (%).

Country (including subregion and rice type if applicable)	Most recent available reporting period	Total cost of production (USD per mt)	Labor cost (USD per mt)	Labor share (%)
India (Telangana)	2021–22	272	84	31
India (Uttar Pradesh and West Bengal)	2021–22	271	92	34
India (Punjab)	2021–22	190	32	17
Pakistan (Punjab, basmati)	2022–23	194	74	38
Pakistan (Punjab, non-basmati)	2022–23	147	55	37
Pakistan (Sindh, non-basmati)	2022–23	124	52	42
Bangladesh	2022–23	259	116	45

Sources: Government of Pakistan, Ministry of National Food Security and Research, Agriculture Policy Institute, July 2022; Government of India, Ministry of Agriculture & Farmers Welfare, Department of Agriculture & Farmers Welfare, Economics, Statistics & Evaluation Division, accessed October 10, 2024; Government of Bangladesh, Bangladesh Rice Research Institute, November 2023.
Notes: As described in the Pakistan country profile in chapter 5, rice production in Pakistan is known to be highly labor intensive, especially in land preparation, transplanting, and harvesting; however, official data do not separate the labor costs associated with each of these production activities. This table added the total costs of these activities to specifically identified labor costs; thus, these labor costs represent an upper bound.

Table 3.2 Costs of production in the Americas: total, labor, and labor share by country, for latest growing season available
In reporting year, U.S. dollars per metric ton (USD per mt), and percentages (%).

Country (including subregion)	Most recent available reporting period	Total cost of production (USD per mt)	Labor cost (USD per mt)	Labor share (%)
Uruguay	2023–24	220	29	13
Brazil	2023–24	389	20	5
United States (Mississippi Delta)	2023	355	16	5
United States (Gulf Coast)	2023	347	22	6
United States (California)	2023	518	35	7
United States (Arkansas non-Delta)	2023	309	13	4

Sources: Asociación Cultivadores de Arroz (The Rice Growers Association of Uruguay), December 2023; Governo do Estado Rio Grande do Sul [Government of the State of Rio Grande do Sul], Instituto Rio Grandense do Arroz [Rio Grande Rice Institute], accessed September 10, 2024; USDA, ERS, "Commodity Costs and Returns," accessed October 3, 2024.
Notes: For Uruguay, labor is identified in the source as "salaries and professional fees," and may include costs that are not direct production costs. As a result, these values likely represent an upper bound on labor costs.

Recent official data on the cost of rice production are not available for farms in China, Indonesia, Thailand, or Vietnam. Table 3.3 presents data from a 2014 study that compared the costs of production across major rice-producing countries. India was included in this study and is included in table 3.3 for comparison. The region of Thailand examined in this study grows mostly long grain white rice, rather than jasmine rice. Much like the differences between basmati and non-basmati rice described for Pakistan above, Thailand's yields and production costs vary widely depending on the type of rice grown, with aromatic (jasmine) rice having much lower yields than long grain white rice.[118] Because of this variation, comparisons of the costs of production between Thailand and other major exporters should be made only when variety of rice being examined is similar.

[118] As described in chapter 6, yields differ significantly between Thailand's regions, depending on the variety of rice grown. Thailand's significant production of low-yielding, single crop jasmine rice drives down its average yield, which increases its average cost of production.

Table 3.3 Costs of production in select Asian countries: total, labor, and labor share by country, for latest growing season available
In reporting year, U.S. dollars per metric ton (USD per mt), and percentages (%).

Country (including subregion)	Most recent available reporting period	Total cost of production (USD per mt)	Labor cost (USD per mt)	Labor share (%)
India (Tamil Nadu)	2013–14	204	69	34
China (Zhejiang)	2013–14	324	69	21
Indonesia (West Java)	2013–14	362	122	34
Thailand (Suphan Buri)	2013–14	204	30	15
Vietnam (Can Tho)	2013–14	150	29	19

Source: IRRI and the Philippine Rice Research Institute, 2017, accessed September 12, 2024.
Notes: These data were sourced from a single study and thus are directly comparable.

As shown in the tables, a key difference in cost structure between systems of production in rice-producing countries is the share of labor in total on-farm costs. India, Bangladesh, Pakistan, and Indonesia are labor-intensive producers, with labor accounting for over 30 percent of the cost of growing rice. China, Thailand, and Vietnam are more mechanized than those countries, with labor representing between 15 percent and 21 percent of costs. The labor cost share in these countries, however, is still above that of the highly mechanized producers in the Americas—Brazil, the United States, and Uruguay—where labor accounts for only between 4 percent and 13 percent of costs. Uruguay stands out as having a significantly lower cost than the other mechanized producers. Farms in Uruguay are very large and efficient, which distributes the costs of mechanization over many high-yielding acres.[119]

The cost of producing rice on the farm is usually measured on a per-unit basis, which means that yields affect delivered costs. If a country improves its yields, it can lower per-unit production costs without changing other aspects of the system of production. As a result, the use of high-yielding seeds and advanced production technology (such as machinery and irrigation) that enhance yields also influence delivered cost for paddy rice. Yield improvements based on genetic improvements have slowed in recent years, and more frequent extreme weather events and water shortages (described below) further threaten yields. Still, some countries such as India and Pakistan have potential for additional yield growth that could lower their delivered costs.[120]

Input Price Spikes

Between 2018 and 2024, the delivered cost of rice was impacted by large fluctuations in input prices for farmers and especially by significant input price spikes in late 2021 and early 2022. Input price volatility during this period stemmed from two major global events—the COVID-19 pandemic (which began in December 2019) and the Russian invasion of Ukraine (which began in February 2022). Both had profound effects on global agricultural markets, including rice. These events led to significantly higher costs of rice production across all major producing countries. In particular, they raised the costs of fertilizer and energy inputs, and they also added to the cost of transporting rice between major

[119] Additional details on Uruguay's system of production are provided in chapter 7.
[120] This potential is explained in chapter 5.

exporting and importing countries. These factors, described below, also contributed to higher international prices for rice, which threatened food-insecure populations in low-income countries.[121]

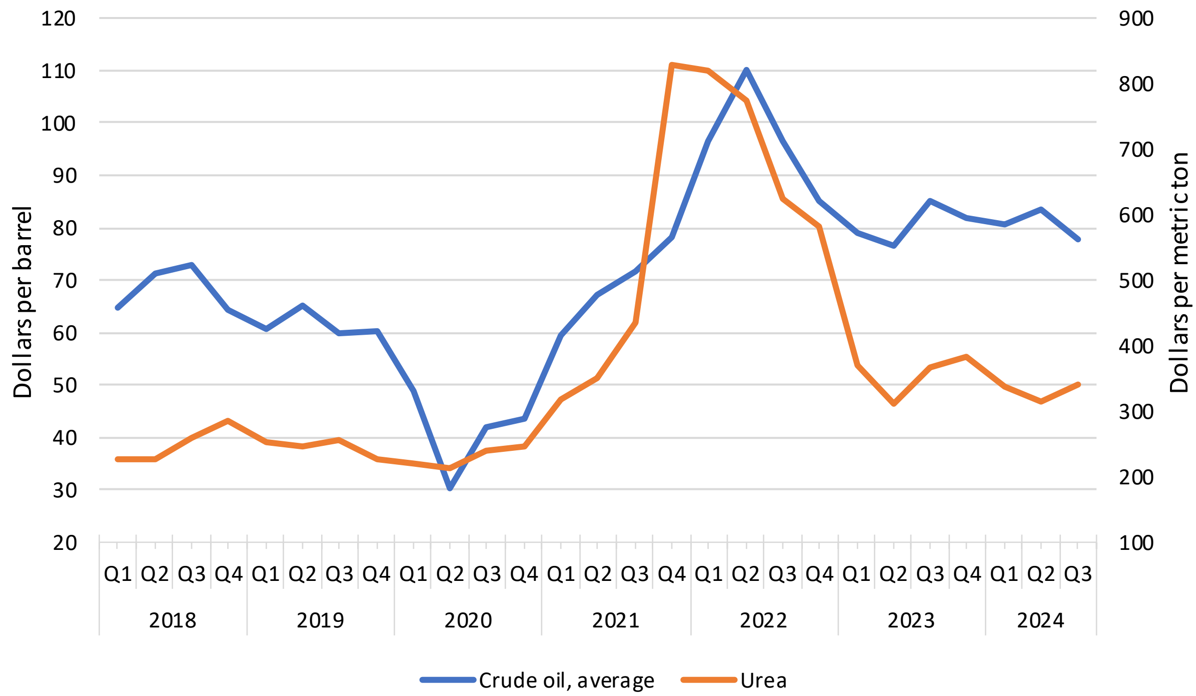
Fertilizer and energy are two key components that contribute to delivered cost for rice. Fertilizers, particularly those based on nitrogen, phosphorus (phosphates), and potassium (potash), are essential to global rice production.[122] For example, fertilizers account for about 30 percent of total input costs in Thailand and Vietnam, and almost 20 percent in the United States.[123] Energy prices impact delivered costs throughout the supply chain, including farm-level production costs, milling and processing expenditures, and the freight rates at which product is moved to ports and domestic consumption centers. Price movements of fertilizer and energy are highly related, especially prices of nitrogen-based fertilizers (e.g., urea and ammonia) for which natural gas is the primary input.

During 2018–23, fertilizer and energy price trends can be grouped into three distinct periods (figure 3.2). Between 2018 and 2020, global fertilizer prices remained relatively stable as a result of steady global demand for fertilizers, particularly from major agricultural producers such as the United States, China, India, and Brazil. The period between mid-2020 and mid-2022 saw dramatic increases in both fertilizer and energy prices. For example, the price of urea increased from $202 per metric ton in May 2020 to $925 per metric ton in April 2022, crude oil prices rose from $21 per barrel in April 2020 to $117 per barrel in June 2022, and natural gas rose from $1.6 per metric million British thermal units (mmbtu) in May 2020 to $42.2 per mmbtu in March 2022.[124] In 2023, prices for these commodities decreased and stabilized at new, higher levels.

[121] Schmidhuber and Qiao, “Rising Input Prices,” November 2021.
[122] AMIS, “Production of Mineral Fertilizers,” accessed various dates; Antip, “Focus on Fertilizer,” June 2024.
[123] Cost of production data compiled by the USITC.
[124] World Bank, “Pink Sheet Data,” accessed October 15, 2024.

Figure 3.2 Prices of crude oil and urea, 2018–24

Dollars per barrel and dollars per metric ton. Underlying data for this figure can be found in appendix F, table F.11.



Source: World Bank, "Pink Sheet Data," accessed October 15, 2024.
Note: Crude oil (U.S. dollars per barrel) left axis. Urea (dollars per metric tons) right axis.

The price hikes of the second period stem from several factors, principally the disruptions caused by the COVID-19 pandemic (which delayed access to key inputs) and the Russian invasion of Ukraine. Russia is a leading exporter of natural gas and oil, and one of the world's largest exporters of nitrogen fertilizers and phosphate.[125] The war led to major disruptions in fertilizer and energy exports as many countries imposed sanctions targeting key sectors of the Russian economy, including banning imports of fertilizers from the country, thereby limiting the supply available to purchase on the global market.[126] The war also disrupted shipping routes and export flows originating in Black Sea ports.[127] These price shocks were felt acutely in many rice-producing developing countries, particularly in sub-Saharan Africa and South Asia.[128]

By late 2023, fertilizer prices had fallen and stabilized at levels close to those before Russia's invasion of Ukraine. Several factors contributed to this stabilization. Some sanctions on Russian fertilizer exports were either lifted or circumvented through new trade arrangements. Other major fertilizer-producing countries such as Canada, the United States, and Morocco increased their production and exports. The

[125] During 2018–23, Russia accounted for roughly 11 percent of global oil exports and 8 percent of natural gas exports. Energy Institute, "Resources and Data Downloads," accessed October 15, 2024; Russia accounted for about one-third of global exports of nitrogen, phosphorus, and potassium fertilizer exports during 2017–22; FAO, "FAOSTAT: Trade," accessed various dates.
[126] USDA, ERS, "Global Fertilizer Market Challenged," September 18, 2023; World Bank, *The Impact of the War in Ukraine on Commodity Markets*, April 2022.
[127] USDA, ERS, "Global Fertilizer Market Challenged," September 18, 2023.
[128] USDA, ERS, "Global Food Insecurity Grows," November 28, 2022.

fall in energy prices, particularly for natural gas, began in mid-2022 and also led to lower production costs of nitrogen fertilizers.[129]

Owing to fertilizer price volatility during this period, development of more sustainable agricultural practices has been growing. In many countries, agricultural research focuses on alternatives to traditional fertilizers, including organic and bio-based fertilizers, as well as precision farming techniques that optimize fertilizer use. These trends are expected to help mitigate the impact of future price fluctuations.[130] Efforts to invest in local fertilizer production, particularly in Africa, have also gained momentum, as many countries seek to reduce their reliance on imports.[131]

Non-Farm Costs

Beyond paddy rice production costs, delivered cost of rice depends on the cost of rice milling (for milled rice) and on transport and other transaction costs. Data on such costs for the selected countries are scarce. However, a particularly important metric during 2018–23 was the efficiency of transportation networks within and between countries, with lower efficiency likely contributing to a higher cost of milled rice. The World Bank ranks countries on various measures related to these as part of its Logistics Performance Index. Of the measures within the index, those most relevant to rice exporting are (1) the infrastructure score, which measures the "quality of trade and transport related infrastructure," including ports, railroads, and roads; (2) the international shipments score, which measures the ease of arranging shipments at competitive prices; (3) the logistics competence and quality score, which evaluates the quality of available logistics providers; and (4) the timeliness score, which measures whether shipments reach their destination within the expected time.[132]

Those four scores for the rice-producing countries profiled in this report reveal that rice producers in the United States and China were best positioned to weather the international logistics challenges during 2018–23, described in the next section (table 3.4).[133] The index scores (calculated to a maximum of 5.0) are also available over time. India, in particular, improved its scores significantly after the Commission's 2015 rice report was published, which likely boosted its rice export competitiveness.[134] The Logistics Performance Index scores apply to the entire transportation and logistics sector in the countries and may not reflect rice industry-specific infrastructure, which is known to be advanced in countries such as Uruguay.

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[129] Despite the input price spikes and other market disruptions, agricultural trade trends, including those for rice, remained largely resilient. Schmidhuber, "COVID-19: From a Global Health Crisis to a Global Food Crisis?," June 2020; USDA, ERS, "U.S. Agricultural Trade Showed Resiliency," July 20, 2022; Arita et al., "Has Global Agricultural Trade Been Resilient," February 1, 2022.
[130] Industry representatives, interviews with USITC staff, June 17–18, 2024.
[131] African Union, "Africa Pledges to Triple Fertilizer Production," May 21, 2024.
[132] World Bank, "Logistics Performance Index," accessed November 6, 2024.
[133] The World Bank's Logistics Performance Index 2023 does not include Pakistan, one of the countries profiled in this report, so Pakistan is excluded from table 3.4.
[134] World Bank, "Logistics Performance Index," accessed November 6, 2024.

Table 3.4 Selected scores from the World Bank's Logistics Performance Index for Rice-Producing Countries, 2023
In logistics performance index (LIP).

Country	Infrastructure Score	International Shipments Score	Logistics Competence and Quality Score	Timeliness Score
United States	3.9	3.4	3.9	3.8
China	4.0	3.6	3.8	3.7
Thailand	3.7	3.5	3.5	3.5
India	3.2	3.5	3.5	3.6
Vietnam	3.2	3.3	3.2	3.3
Brazil	3.2	2.9	3.3	3.5
Indonesia	2.9	3.0	2.9	3.3
Uruguay	2.7	2.7	3.1	3.2
Paraguay	2.5	2.7	2.6	3.0
Bangladesh	2.3	2.6	2.7	3.0

Source: World Bank, "Logistics Performance Index," accessed November 6, 2024.

Global Shipping Cost Increases

Rice that is exported is typically transported via maritime shipping, making freight rates an important component of delivered cost. Between 2018 and 2023, global shipping faced several significant disruptions that affected international rice markets and trade, leading to challenges for many producers in ensuring reliable supply and increasing costs.[135] These stem mostly from the COVID-19 pandemic, and geopolitical tensions (especially the Russian invasion of Ukraine). These disruptions led to fluctuations in shipping costs that included a dramatic spike in freight rates during 2021 and 2022.

In global trade, rice transported via maritime shipping may be shipped on break-bulk vessels or on container ships. Break-bulk vessels are intended to carry a mix of large or heavy objects; rice that is loaded onto these ships is typically packed in 50 kg tote bags and then placed directly in the ship's cargo hold. Break-bulk shipping is the typical method used for exports of paddy rice, and other types of rice can be shipped this way as well. While there are exceptions, break-bulk shipping is more often used for milled rice that is of lower quality or is intended for further processing, or for large-volume shipments. Container shipping, by contrast, offers more protection against moisture and damage and is often the shipping method of choice for rice that is high quality or shipped in small volumes, particularly rice that is already bagged in consumer packaging before export.[136] As described below, the differences between these shipping methods became particularly important in the rice industry during 2018–23 because the global disruptions that raised shipping costs did not affect the two methods equally.

The 2020 onset of COVID-19 pandemic led to unprecedented disruptions to transportation and logistics operations across the globe and had consequences for rice trade.[137] Initially, demand for shipping fell as global trade slowed down because of widespread economic shutdowns.[138] By mid-2020, however, demand for goods rebounded sharply as countries began to emerge from lockdowns and consumers shifted spending from services to goods. This sudden surge in demand overwhelmed the global shipping

[135] Ocean transportation for rice includes both container vessels and bulk vessels.
[136] Industry representative, email correspondence with USITC staff, December 23, 2024.
[137] FAO, *Agricultural Trade & Policy Responses*, 2021; World Bank, *A Shock Like No Other*, April 2022.
[138] USITC, *Impact of COVID-19 Pandemic*, November 2021.

industry, which had not yet recovered from the pandemic-induced disruptions.[139] Shipping companies grappled with severe shortages of containers, which became stuck at ports, warehouses, and distribution centers.[140] The container shortage coupled with increased demand for consumer goods resulted in a surge in freight costs.[141] For example, the cost of shipping a 40-foot container from Asia to the United States increased from about $1,500 in early 2020 to over $10,000 by mid-2021. The same dramatic price hikes were seen on routes to Europe and other major trade lanes.[142]

In 2022, global shipping remained volatile, particularly due to the Russian invasion of Ukraine in February 2022.[143] Because of sanctions imposed on Russian shipping companies in response to the invasion, goods routinely transported via Russian ports had to be rerouted through other countries. In addition, oil prices surged in response to the conflict, driving up fuel costs for shipping companies which were passed on to customers in the form of increased shipping rates. By the end of 2022, shipping rates moderated as new shipping capacity came online and consumer demand began to normalize following the pandemic boom.

Although these increases in freight rates between 2020 and 2022 affected all rice exporters, container shipping was disrupted more than break-bulk shipping. Container shipping rates increased nearly sevenfold, as noted above, while bulk shipping rates increased by a slightly more modest factor of four to five.[144] Bulk shipping rates also came down more quickly after the spike and were not affected by the shortage of containers. One shipping industry publication reported that this difference led to an increase in the share of rice shipped via break-bulk vessels, particularly for rice shipped from Asia to West African markets. Rice shipped on these routes had previously been mostly in containers. However, during the freight rate spike, only rice shipped in bulk was able to be price-competitive in West African markets because container freight for rice was about twice as expensive as break-bulk shipping.[145]

The freight rate spikes in the second half of 2018–23 highlighted the competitive advantages that can stem from favorable logistics and transportation for rice producers. These advantages can stem from the types of shipping available to rice producers as well as the distance to major markets. For example, as described in chapter 9, the United States is one of only a few paddy rice exporters in the world and therefore ships a higher share of its rice via more affordable break-bulk shipment (since paddy rice is typically shipped in bulk). In particular, the United States has a transportation cost advantage for bulk shipments of paddy rice to Mexico, its largest market, and the relative importance of this advantage increased during the period of container shortages. Short distances to a major market also create an advantage for rice producers; a study on global grain shipping found that a 10 percent increase in the

[139] USITC, *Impact of COVID-19 Pandemic*, November 2021.
[140] USA Rice Federation (USA Rice), "U.S. Rice Exports, Among Other Commodities," March 17, 2021; Northam, "The Pandemic Economy's Latest Victim?" November 16, 2021.
[141] OECD, "Maritime Transportation Costs in the Grains and Oilseeds Sector," June 14, 2022.
[142] Contributing to the spike in freight rates in 2021 was the blockage in March of the Suez Canal, when the Ever Given, one of the world's largest container ships, ran aground and blocked all traffic for nearly a week. About 12 percent of global trade passes through the Suez Canal, which connects the Mediterranean Sea with the Red Sea and serves as a shortcut between Europe and Asia.
[143] Schmidhuber, Mustafa, and Qiao, "The War in Ukraine," June 2022.
[144] UNCTAD, "Chapter 3: Freight Rates and Transport Costs," 2022.
[145] Breakbulk News, "Shift to Breakbulk for Shipping Rice," October 5, 2021.

distance between markets led to a 2.5 percent increase in freight rates. That study found that freight rates have an important effect on final delivered cost for grain producers.[146]

Preferential Market Access

Tariffs also contribute to the delivered cost of rice. Many countries maintain high tariffs on rice, and that cost is added to the final cost of rice shipped to those markets. For this reason, preferential market access granted under bilateral or regional trade agreements can significantly lower the cost of rice imported from that trade partner, often providing a significant price advantage to that supplier.[147] By contrast, tariff preference erosion can reduce the competitiveness of certain exporters as compared to others. For example, the United States has duty-free access to the Mexico's rice market under the United States-Mexico-Canada Agreement (USMCA) and reduced-tariff access to rice markets in Central America under the Central America-Dominican Republic Free Trade Agreement (CAFTA-DR).[148] However, changes to import tariffs in Mexico and Costa Rica for rice that equalized tariff rates for other sources of imports have led to greater competition in these markets and declining cost competitiveness for U.S. rice, as discussed in chapter 9.

Product Differentiation

Product differentiation relates to myriad attributes of rice, each of which may appeal to different buyers. These attributes include the variety of rice offered, product quality as measured by factors such as the percentage of broken rice included in the finished product and its cooking properties, certifications, and branding. The ability of a supplier to offer a more differentiated product increases the chances that these qualities will influence a buyer's purchasing decision, potentially making them willing to pay a higher price.

Product Mix

The major rice-producing countries differ in the varieties of rice they offer. A key determinant of the product mix offered is what markets a rice producer is chiefly targeting. The major rice producers that are less export oriented—Bangladesh, China, and Indonesia—do not alter the types of rice they produce based on demand in export markets. Indonesia has virtually no exports of rice, and Bangladesh exports only small volumes of locally important varieties of aromatic rice to diaspora communities. China, which increased its exports during 2018–23, primarily exported from its stocks, which means exports were mostly of rice that was produced with the domestic market in mind. As a result, these exports are mostly of white and brown medium grain rice that is not differentiated according to quality.

Most export-oriented rice-producing countries offer a variety of rice types to appeal to a range of buyers. Variety in the types of rice offered relates both to the specific crop grown—in terms of aromatic vs.

[146] This study did not specifically include rice in its analysis. Deuss, Maggi, and Frezal, "Maritime Transportation Costs in the Grains and Oilseeds Sector," June 2022.
[147] In some import markets, rice may also receive preferential access under preference programs for developing nations. For example, some rice is eligible for such preferences under the EU's Generalised Scheme of Preferences.
[148] Tariff phaseouts were not complete under CAFTA-DR until January 1, 2025, which was after the period of study for this report.

nonaromatic or the grain length—and to the level of processing. All export-oriented rice-producing countries are major suppliers of at least three different types of rice (table 3.5). Some, such as India and Pakistan, offer mostly aromatic and nonaromatic long grain rice. Thailand and Vietnam, in particular, have a broad product mix—they are leading suppliers of both aromatic and nonaromatic long grain white rice and of certain types of short and medium grain white rice. The United States offers both long grain and medium grain white rice. It also competes in paddy rice markets alongside South American producers and, increasingly, India. Most export-oriented producing countries are able to expand their product mix by exporting brown rice, broken rice, and parboiled rice.

Table 3.5 Rice-exporting countries' status as major or minor exporters of various rice types
— = not applicable**.**

Country	Aromatic	Long grain white	Medium and short grain white	Parboiled	Broken rice	Brown rice	Paddy rice
Brazil	—	Major	—	—	Major	Minor	Major
China	—	—	Major	—	—	Major	Minor
India	Major	Major	—	Major	Major	Minor	Major
Pakistan	Major	Major	—	Major	Major	Major	Minor
Paraguay	—	Major	—	—	Minor	Major	Major
Thailand	Major	Major	Major	Major	Major	Major	—
United States	—	Major	Major	Major	Minor	Major	Major
Uruguay	—	Major	—	—	Minor	Major	Major
Vietnam	Major	Major	Major	—	Major	Minor	—

Source: S&P Global, Total exports, HS heading 1006, rice, accessed June 17, 2024.
Note: Minor exporters refer to those countries that export the type of rice only in limited or inconsistent volumes.

Product Quality

Many rice buyers reportedly consider product quality important when purchasing rice, but those attributes are difficult to measure across countries. One way of assessing rice quality is the milling yield. This is the share of milled rice (either total rice or whole kernels, as described below) obtained from paddy rice after processing. Milling yields depend partly on the quality of the crop. For example, rice grown under difficult growing conditions, such as during a season with unusually high nighttime temperatures, is thinner and breaks more easily.[149] Yields also depend partly on the efficiency of the mill's machinery.

The milling yield includes two components: the milling recovery rate and the head rice recovery rate.[150] When comparing milling yields across countries, information is generally available only about the milling recovery rate, which is simply the total volume of all milled rice (regardless of breakage) as a percentage of the paddy rice that entered the mill. According to both the International Rice Research Institute (IRRI) and the U.S. Department of Agriculture (USDA), the milling recovery rate is fairly consistent between countries. The rate averages between 63 percent and 70 percent for any country using modern mills, including all the major producers in this report.[151]

[149] Hardke, "Woe Is Rice Milling," November 19, 2021; IRRI, "Milling Yields," accessed November 5, 2024.
[150] Hardke and Siebenmorgen, "Production Factors Affecting Rice Milling Quality," December 12, 2012.
[151] IRRI, "Milling Yields," accessed November 5, 2024; USDA, FAS, "PSD Online," accessed November 4, 2024.

A better measure of product quality than the milling recovery rate is the head rice recovery rate, which is the percentage of rice in which the whole kernel (or nearly the whole kernel) remains unbroken after milling.[152] It is difficult to find data on head rice recovery rates because they vary between mills, between crops, and even from day to day within a given mill. Head rice recovery rates may be as low as 45 percent (even in some modern mills) and can reach 60 percent or higher under ideal conditions.[153] Within the United States, California typically achieves a higher head rice recovery rate (60–65 percent) than the average in the U.S. South (55 percent) because of the more favorable growing conditions in California. The rice variety is a factor, too: medium grain rice, which is grown mostly in California, usually has a higher recovery rate than long grain rice.[154]

An additional aspect of milling related to product differentiation is the ability to segregate broken rice from whole kernels efficiently. Mill equipment varies in how well it can perform this task.[155] In some countries, mills segregate rice using labor-intensive practices, such as hand sorting of rice kernels. After broken rice is separated, it can be sold as a distinct product for use in animal feed and food ingredients. The food ingredients sector is a growing market and a key source of demand for broken rice. Consumers in some countries also prefer broken rice for household consumption, especially for certain dishes.[156] Despite a mill's efforts to segregate broken from whole kernels and sell broken rice separately, some broken rice is typically included in finished, whole rice. The degree of inclusion of broken rice in milled white rice varies widely; for example, FAO price monitoring for global rice prices includes white rice with anywhere from 2 percent to 25 percent broken kernels.[157] Rice prices generally reflect these quality differences, with a higher percentage of broken rice resulting in lower prices. For example, according to 2024 export price data available from FAO, long grain rice with 4–5 percent broken rice averaged $678 per metric ton (mt), compared with an average of $531 per metric ton for long grain rice with 25 percent broken rice.[158]

Other physical characteristics of rice are important to buyers and may therefore influence the price and marketability of a particular product. One characteristic is the level of chalkiness in the rice. Chalkiness is an opacity in rice that can result from growing conditions such as excessive temperatures, and it results in lower milling yields. It also results in lower prices from buyers because the appearance of chalky rice is less desirable.[159] Other aspects of rice quality that affect price include the whiteness of the rice and its moisture content.[160] No data are available to compare rice between countries according to these attributes, but some instances where they have affected product reputation with buyers have been reported. For example, in 2013 the Central America Rice Federation sent a letter to the U.S. government and U.S. rice industry representatives complaining about problems with the quality of U.S. rice,

[152] Lapis et al., "Measuring Head Rice Recovery in Rice," 2019.
[153] IRRI, "Milling Yields," accessed November 5, 2024.
[154] Industry representative, interview by USITC staff, August 26, 2024; Hardke, Jarrod, "Woe Is Rice Milling," November 19, 2021.
[155] Lapis et al., "Measuring Head Rice Recovery in Rice," 2019, 90; industry representative, interview with USITC staff, August 26, 2024.
[156] For example, Senegal and Gambia import broken rice for human consumption, and it is widely used in the region's traditional dishes. Richardson et al., "A Broken Market," December 1, 2022.
[157] FAO, "Rice Price Update," accessed November 5, 2024.
[158] FAO, "Rice Price Update," accessed November 5, 2024.
[159] Korzekwa, "To Fertilize or Not to Fertilize," March 28, 2022.
[160] IRRI, "Physical Quality of Milled Rice," accessed November 5, 2024.

particularly chalkiness and cooking properties. The letter warned that the United States was poised to lose sales in the region if these issues were not resolved.[161] Although the United States remained a major exporter to Central America in 2024, as described in chapter 9, some of these reputational issues with respect to rice quality persist.

Certifications and Standards Compliance

An additional aspect of product differentiation is the ability to meet standards, whether those standards are regulatory requirements, such as compliance with pesticide maximum residue levels, or voluntary, such as organic certification. Rice producers that can meet buyer standards are more successful in selling their product to the widest possible range of customers. For example, rice producers in California benefit from a drier climate that results in lower use of agrichemicals, which allows them to more easily comply with rules in markets that have stringent maximum residue levels for rice.[162] By contrast, the system of rice production in India tends to lead to overuse of agrichemical inputs, and Indian producers report a loss of access to some markets due to potential maximum residue level violations.[163]

Production of rice under voluntary standards, such as organic standards, accounts for a small share of the global market, but one that is slowly growing. For instance, annual U.S. imports of USDA-certified organic rice were 24,000 mt during 2018–23, up from 20,000 mt between 2011 and 2017.[164] An important driver of demand for organic rice is the growing use of rice as an ingredient in packaged foods that are marketed to health-conscious consumers.[165] If the share of rice produced under voluntary standards continues to grow, it will benefit producers who have production systems conducive to meeting these standards. Such systems could include growing environments with naturally lower pest pressures (i.e., less need for pesticides) and larger mills that can segregate rice in order to preserve the identity of rice meeting the standard (thereby allowing the mill to handle organic and non-organic rice, for example).[166]

Marketing and Branding

A final important aspect of product differentiation is marketing and branding. Some countries, such as Thailand, benefit from consumer recognition of their rice in major export markets. Thailand's longstanding reputation, particularly for its Hom Mali jasmine rice (which has enforceable quality standards), has boosted consumer demand for its rice and supported higher prices. In some export markets, such as the European Union (EU), rice producers may apply for a geographical indication or other intellectual property protection to further differentiate their product. Hom Mali jasmine rice, for example, has a registered protected geographical indication in the EU, and both India and Pakistan have

[161] Bennett, "Quality Paramount to Importers," August 30, 2013.
[162] Industry representative, interview by USITC staff, August 26, 2024.
[163] See chapter 5 for additional details.
[164] S&P Global, HS heading 1006, rice, accessed June 17, 2024; Childs and Raszap Skorbiansky, *Rice Outlook*, July 16, 2018.
[165] Industry representative, interview with USITC staff, August 26, 2024.
[166] Industry representative, interview with USITC staff, August 23, 2024; Childs and Raszap Skorbiansky, *Rice Outlook*, July 16, 2018.

applied for the same for basmati rice, as described in chapter 5.[167] Other countries, including Vietnam, have rice that meets buyer quality expectations but is less well recognized by buyers and consumers. The success of a country's rice industry at marketing its product in overseas markets depends on a variety of factors, including business relationships, actual and perceived quality, packaging, and labeling.[168]

Reliability of Supply

Reliability of supply, which refers to the ability of a rice producer to deliver a specified quantity of rice to a buyer by a particular time, was an especially important factor of competitiveness during 2018–23. Reliability was affected by various factors including the global supply chain disruptions described above, as well as climate-related disasters and policy decisions among major suppliers that affected the relative competitiveness of rice suppliers.

Some major rice-producing countries—chiefly Bangladesh and Indonesia—are reliable suppliers only in their domestic market. These countries consider rice an important part of their food security strategy and have demand that exceeds domestic supply, resulting in little to no exporting. China also prioritizes its domestic market, exporting only a small share of its production and mostly sourcing these exports from older stocks. Even among major exporters like India, some governments periodically put export restrictions in place to ensure sufficient domestic supply. This reduces the country's reliability of supply in export markets, as described in the export restrictions section below.

To be a reliable supplier of rice on the global market, a country must have an exportable surplus. A key measure of this factor is the export-to-production ratio. A large and stable export-to-production ratio suggests greater reliability of a country as an exporter. Reliability can also be measured as the stability in export levels over time; some producers are inconsistent exporters.

This stability can be measured by the coefficient of variation (CV) of exports, which is the standard deviation in the annual quantity of rice exported over the six-year study period, divided by the average annual export quantity. Countries with lower CVs have lower variation in their export levels and can be considered more reliable suppliers of rice.[169] As shown in table 3.6, Uruguay and Paraguay have both the highest export-to-production ratios and the lowest CVs among major rice producers. Among leading rice exporters, India has by far the highest CV, which reflects inconsistency in its rice export levels driven in part by its government policies, particularly export restrictions, as described below.

[167] EU, "eAmbrosia Database," accessed November 29, 2024.
[168] USITC, *Rice: Global Competitiveness*, April 2015, 110.
[169] USITC, *Rice: Global Competitiveness*, April 2015, 115.

Table 3.6 Export-to-production ratios and coefficient of variation in export levels for rice-exporting countries, marketing years 2018/19–2023/24
CV = coefficient of variation.

Country	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24	Period CV of exports
Brazil	12.3	16.0	11.9	19.0	17.6	17.4	0.16
China	1.9	1.8	1.5	1.4	1.2	1.4	0.16
India	8.9	10.5	16.3	17.0	14.9	11.9	0.25
Pakistan	62.4	53.0	46.1	51.7	51.6	61.1	0.14
Paraguay	96.0	100.6	80.7	103.7	107.8	97.5	0.10
Thailand	37.2	32.4	33.3	38.6	41.8	42.0	0.15
United States	41.6	50.9	41.2	43.7	40.4	44.9	0.13
Uruguay	100.7	102.2	85.7	101.2	95.9	95.0	0.08
Vietnam	24.1	22.8	22.9	26.4	30.5	28.9	0.11

Source: USDA, FAS, PSD Online database, accessed various dates; CV of exports calculated by USITC staff.

Climate-Related Disruptions

Some of the variation in export levels among rice producers during 2018–23 can be explained by climate-related disruptions. Climate-related risks to rice crops include floods, droughts, saltwater intrusion, and excessive heat that can affect yields. One of the major climate-related events causing supply disruptions during the period was a severe drought in California in 2022 that caused U.S. rice production to fall to its lowest level in three decades, as described in chapter 4. That same year, Pakistan experienced severe flooding that resulted in an over 20 percent drop in production compared to the previous year, as shown in chapter 5. Both countries experienced a one-year drop in export volumes because of the lower production. However, both countries were able to recover from these disruptions quickly, regaining normal production and export volumes within a year.

Many rice-producing countries are developing long-term strategies that will help them recover more quickly from disasters and adapt to more gradual changes that are taking place as a result of climate change.[170] All rice-producing countries are experiencing climate-related risks to production, and strategies for minimizing market disruptions vary and can affect competitiveness. For example, as described in chapter 6, a key competitive advantage for Vietnam is that it is developing rice varieties and production practices to respond to the emerging challenge of saltwater intrusion in its growing areas. In Arkansas, researchers are developing rice varieties that are better able to withstand high nighttime temperatures.[171] Producers and researchers in many countries are also experimenting with techniques such as alternate wetting and drying (intermittent irrigation) that reduce water use while preserving yields.[172]

[170] Sengupta, "Rice. Half of Humanity Eats It," May 20, 2023; foreign government official, interview by USITC staff, Vietnam, June 20, 2024; U.S. government official, interview by USITC staff, April 1, 2024; USA Rice, "USA Rice Joins Important Ag Alliance," February 22, 2021; USA Rice, "The Rice Stuff Launches Series on Climate Change," September 28, 2021.
[171] Sengupta, "Rice. Half of Humanity Eats It," May 20, 2023.
[172] IRRI, "Saving Water with Alternate Wetting Drying," accessed November 5, 2024; Sengupta, "Rice. Half of Humanity Eats It," May 20, 2023.

Export Restrictions

Export restrictions, which are generally imposed by governments to ensure sufficient volume of rice in their domestic markets, can affect reliability of supply in export markets. India's export restrictions, imposed in 2022 and removed in 2024 as described in chapter 5, were the most significant restrictions in place among rice producers during 2018–23. As shown in table 3.3, these restrictions caused India's export-to-production ratio to fall from 17 percent in MY 2021/22 to under 12 percent in MY 2023/24 and drove the high CV of exports (0.25) during the period. Other rice exporters were able to take advantage of India's reduced reliability as a supplier in various markets during those years. For example, Pakistan was a direct beneficiary of India's export restrictions, because the two countries compete in many of the same markets; it exported a record volume of rice in 2024 amid India's restrictions. Vietnam also competes directly with India, particularly in certain markets such as West Africa, and benefited from the restrictions; its market share in West Africa has grown from 2022 onward.[173]

Comparisons of Government Support

Government policies supporting the rice industry can directly influence many aspects of competitiveness. As described in chapter 1, these policies may be designed to support rice producers, provide low-cost rice to consumers, bolster exports, or ensure food security, among other aims. Among the most common policies across the rice-producing countries described in this report, one is the implementation of programs that lower the cost of production for farmers, which may include direct payments or support for the cost of inputs, irrigation, or land. Other policies described throughout the report that affect competitiveness include trade policies, export promotion programs, and research and extension services. These policies are described for each country in the regional chapters that follow.

Comparing overall levels of government support for the rice industry is difficult because many policies are not specific to the rice sector and therefore may not be reported to trade partners. In general, policies that are reported are documented in World Trade Organization (WTO) Domestic Support notifications, as required by WTO members under the Agreement on Agriculture. These notifications provide the dollar value of government assistance. Even so, cross-country comparisons are difficult to assess because countries use different methods of accounting and sometimes accuse others of underreporting or not reporting relevant programs.

The Organisation for Economic Co-operation and Development's (OECD's) Agricultural Policy Monitoring and Evaluation annual reports give estimates of the monetary value of government support provided to producers and consumers of agricultural products. Estimates are reported for 54 countries, including 8 rice-producing countries profiled in this report. Because the methods used to calculate the value of support are applied consistently across countries, the estimates allow for making intercountry comparisons. One support measure available specifically for rice is the OECD's Market Price Support (MPS) indicator. MPS is calculated as the "annual monetary value of gross transfers from consumers and taxpayers to agricultural producers arising from policy measures that create a gap between domestic market prices and border prices of a specific agricultural commodity, measured at the farmgate level."[174]

[173] S&P Global, HS heading 1006, rice, accessed June 17, 2024.
[174] OECD, OECD Data Explorer, accessed October 21, 2024.

A comparison of market price support for six of the report's profiled countries, as well as Japan and South Korea (which are major markets described in chapter 9), shows a wide range of MPS values (table 3.7).

Table 3.7 Market price support and farmgate production value for rice, 2017–22
in millions of U.S. dollars.

Country	Support/transfer	2017	2018	2019	2020	2021	2022
Japan	Market price support	11,609	11,247	11,520	11,405	8,415	3,242
Japan	Farmgate production value	15,527	16,599	16,755	16,791	14,156	10,476
South Korea	Market price support	2,793	4,528	4,623	4,344	5,285	2,779
South Korea	Farmgate production value	6,002	7,846	7,656	7,390	9,293	6,798
United States	Market price support	0	0	0	0	0	0
United States	Farmgate production value	2,299	2,820	2,517	3,276	3,085	3,112
Brazil	Market price support	0	0	0	436	0	440
Brazil	Farmgate production value	3,106	2,647	2,427	3,368	3,695	3,348
China	Market price support	23,313	8,996	7,633	14,534	28,256	31,528
China	Farmgate production value	86,727	82,990	77,164	84,419	89,453	85,404
India	Market price support	-2,178	-5,090	-8,696	-17,132	-7,056	-13,403
India	Farmgate production value	45,755	45,510	44,498	50,502	53,174	52,562
Indonesia	Market price support	12,414	7,929	7,439	3,971	3,773	9,212
Indonesia	Farmgate production value	33,351	22,882	21,057	20,849	19,251	23,496
Vietnam	Market price support	1,013	-1,944	-1,396	-2,121	-1,323	-606
Vietnam	Farmgate production value	11,973	10,777	9,627	10,203	11,939	11,264

Source: OECD, OECD Data Explorer, accessed October 21, 2024.
Note: Negative values for market price support are estimated when the domestic market prices received by producers are below the border prices, i.e., when a transfer occurs from producers to consumers. This occurred for India following the imposition of export controls (see the India profile in chapter 5 for more details).

Competitive Factors by Profiled Country

The country profiles in chapters 4–7 detail strategies the major rice-producing countries use to compete with other producers in terms of factors that affect their costs of production, product differentiation, and reliability of supply. An overview of competitive factors for the profiled countries (table 3.8) shows the range of approaches countries have used to adapt to a competitive environment that has been challenged by the high input costs, global shipping disruptions, and climate disasters described above. In some countries, government policies are an important aspect of how producers respond to these challenges. In some cases, strong marketing, quality advantages, or proximity to key markets have provided a buffer that has kept producers a step ahead of the competition.

Table 3.8 Competitive factors for profiled exporting countries

United States	• Relatively high costs of production limit the ability to compete in certain markets • Efficient transportation logistics bolster reputation as a consistent, timely supplier • Geographic proximity and historic tariff advantages with large purchasers enhance competitiveness in the paddy rice market • Increasing prevalence of hybrid varieties of long grain rice has improved yields, but sometimes this comes at the cost of milling quality • Production of aromatic varieties, which are increasingly popular with consumers, is limited
India	• Government policies lower the cost of production and increase supply, but also lower reliability in export markets • Production and export promotion of basmati and specialty varieties increase product differentiation • Climate-related disasters cause major disruptions to production
Pakistan	• Low cost of production is enhanced by a mix of government policies beneficial to producers • Production of basmati provides a natural source of product differentiation • Industry is highly export oriented
Vietnam	• Full utilization of natural endowments allows for steady, low-cost rice production • Government rice policies help the industry adapt to challenges • Lack of investment in off-farm value chain leads to high losses • Underdeveloped marketing limits sales in higher-value export markets
Thailand	• Successful marketing has created positive reputation in higher-value markets • Cost of production is high for long grain white rice • Rice productivity limited by low innovation and lagging investment
China	• Government programs support reliable domestic production • Trade policies limit competition in the domestic long grain rice market • Exports are primarily a means to reduce stocks, so exportable supply fluctuates • Old-crop rice exports have competitive delivered costs in the global market
Brazil	• High production costs are offset by high crop yields and mechanized production • Participation in the paddy rice market creates opportunities to export with lower trade barriers and less competition from other producers • Internal transportation costs from points of production to domestic consumption centers and ports are high
Uruguay	• Highly efficient production system results in low cost of production • Coordination within the industry supports the production of high-quality rice at a competitive price • High quality rice has a positive reputation in export markets • Further expansion of capacity is constrained by yield limits and land availability
Paraguay	• Low-cost, high-quality production is supported by domestic and foreign investment • Production is oriented toward the large and stable Brazilian market

Source: Compiled by the USITC from sources described in chapters 4–7.

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Chapter 4
The United States

Summary

The United States is a relatively small producer in comparison to some of the major rice-producing countries, accounting for about 1 percent of global rice production. The United States is a leading exporter, however, in the global rice market, ranking as the fifth-largest exporter by volume in each year between 2018 and 2023. Exports are important for the U.S. industry—about two-fifths of its total rice crop was destined for foreign markets, primarily Mexico, Haiti, Japan, Canada, and Honduras between 2018 and 2023. Although the United States maintained its position as one of the leading global exporters during 2018–23, the volume of U.S. exports fell by 14 percent over this period. Similarly, U.S. exports as a share of global exports fell slightly from 7 percent in 2018 to 5 percent in 2023.

In addition to supplying large quantities of rice to the global market, the United States also supplies much of its own domestic rice consumption. Domestically grown rice dominates most segments of the U.S. market, except for the aromatic rice segment, which is largely supplied by imports from Thailand and India.

The United States maintains a competitive edge in several global rice markets, owing to its advanced production systems, reliability of supply, efficient transportation logistics, and tariff preferences. Some of these advantages, however, have eroded in the face of growing competition from foreign suppliers in certain markets. This chapter provides a profile of the U.S. rice industry; chapter 9 describes U.S. competitiveness in particular global markets in more detail.

Rice Production, Consumption and Stocks, and Trade

Production

The United States accounted for approximately 1 percent of global rice production between marketing year (MY) 2018/19 and MY 2023/24 (tables 2.1 and 4.1). Production levels during this period averaged 6.4 million metric tons (mt) annually.[175] U.S. rice production dropped to 5.1 million mt in MY 2022/23, the lowest level in nearly three decades. This decline was largely due to a drop in California's production. Extreme drought in the state during 2021–22 necessitated curtailment of irrigation water, resulting in a

[175] Two variables that influence fluctuations of U.S. rice production levels from year to year are water availability and the relative profitability of alternative crops, such as soybeans. Caraway, "USA-Grown Rice Rules Domestic Market," December 15, 2023.

300,000 acre decline in planted rice.[176] Following substantial rainfall in late 2022 and early 2023, coupled with spring snowmelt, California's plantings returned to pre-2021 levels and total U.S. rice production rebounded to 6.9 million mt in MY 2023/24.[177] Overall, U.S. rice production decreased by 2.4 percent between MY 2018/19 and MY 2023/24.

Table 4.1 United States: rice production, consumption, stocks, and trade, MY 2018/19–2023/24
In metric tons (mt), hectares (ha), kilograms (kg), metric tons per hectare (mt/ha), and percentages (%). MY = marketing year.

Attribute	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
Beginning stocks (1,000 mt)	933	1,422	910	1,387	1,261	961
Production (milled) (1,000 mt)	7,105	5,873	7,205	6,066	5,082	6,931
Area harvested (1,000 ha)	1,177	1,002	1,205	1,003	877	1,155
Yield (rough) (mt/ha)	8.6	8.4	8.5	8.6	8.3	8.6
Imports (1,000 mt)	920	1,186	1,082	1,199	1,267	1,416
Consumption and residual (1,000 mt)	4,577	4,580	4,841	4,740	4,596	4,943
Exports (1,000 mt)	2,959	2,991	2,969	2,651	2,053	3,115
Ending stocks (1,000 mt)	1,422	910	1,387	1,261	961	1,250
Exports-to-production ratio (%)	41.6	50.9	41.2	43.7	40.4	44.9
Ending stocks-to-use ratio (%)	18.9	12.0	17.8	17.1	14.5	13.4
Per capita consumption (kg)	14.4	14.0	14.7	14.3	13.8	14.8

Source: USDA, FAS, PSD Online database, accessed September 13, 2024; World Bank, Data: Population, accessed September 13, 2024.
Note: Per capita consumption was calculated using marketing year apparent consumption divided by calendar year population. All other data, including imports and exports, are based on the marketing year from August to July.

The United States maintains high yields for its rice production. All U.S. rice is produced in irrigated fields, which reduces yield risk.[178] The average U.S. yield was 8.5 metric tons per hectare (mt/ha) during MY 2018/19–2023/24 compared to the global average of 4.6 mt/ha (figure 2.3 and table 4.1).

Consumption and Stocks

The United States accounted for less than 1 percent of global rice consumption during MY 2018/19–2023/24 (tables 2.4 and 4.1). Rice consumption in the United States gradually increased over this period by 8.0 percent, from 4.6 million mt in MY 2018/19 to 4.9 million mt in MY 2023/24. Increased rice consumption in the United States is attributable to rising demand for gluten-free foods (including rice and rice-based products) and the growth in population of certain ethnic groups with higher per capita rice consumption.[179] Per capita rice consumption in the United States is markedly lower than the global average. In MY 2023/24, U.S. per capita consumption was 15 kilograms compared to global per capita consumption of 65 kilograms (figure 2.4 and table 4.1).

The majority of U.S. rice consumption is supplied by domestically grown rice, with imports (primarily of aromatic rice) supplying the balance.[180] However, imported rice represented a growing share of U.S.

[176] California's rice plantings in 2022 were the lowest since 1958. California rice farmers lost an estimated $871 million in revenue because of drought. These losses were partially offset by crop insurance payouts totaling $350 million. Smith, "California Rice Is Back," August 23, 2023; USDA, ERS, "Rice Sector at a Glance," September 27, 2023.
[177] USDA, ERS, "Rice Sector at a Glance," September 27, 2023.
[178] USDA, ERS, "Rice Sector at a Glance," September 27, 2023; USITC, hearing transcript, April 30, 2024, 27, 85 (testimony of K. Bradley Watkins, University of Arkansas System Division of Agriculture).
[179] USDA, ERS, "Rice Sector at a Glance," September 27, 2023; Hamilton, "East Meets West," January 15, 2023.
[180] Caraway, "USA-Grown Rice Rules Domestic Market," December 15, 2023.

consumption in MY 2018/19–2023/24. A comparison of data for U.S. consumption and imports shows that the share accounted for by domestically grown rice declined from 80 percent in MY 2018/19 to 71 percent in MY 2023/24 (table 4.1). This continued a general trend of imports representing a slightly higher share of U.S. consumption than they did historically—between MY 2007/08 and MY 2013/14, domestic production accounted for over 81 percent of U.S. consumption each year.[181]

The United States held less than 1 percent of global ending stocks of rice during MY 2018/19–2023/24 (figure 2.6 and table 4.1). Over this period, U.S. ending stocks of rice fluctuated from year to year, averaging 1.2 million mt annually. Most paddy rice stocks and all milled rice stocks are stored off-farm at a combination of mills, elevators, warehouses, and ports.[182] A small amount of paddy rice stocks is stored on-farm.[183] Each marketing year, paddy rice stocks stored both on-farm and off-farm reach their peak level following the harvest period and then gradually decline until the subsequent harvest period.[184]

Trade

The United States is highly active in the global rice market and ranked as one of the top exporters and importers in the world throughout the 2018–23 period.[185] The United States has long been a net exporter of rice; however, this trade surplus shrank during 2018–23 because the value of U.S. imports increased at a faster rate than the value of U.S. exports.

Exports are important for the U.S. industry—about 43 percent of the total U.S. rice crop between MY 2018/19 and MY 2023/24 was destined for export markets (table 4.1). Although the United States is a relatively small rice-producing country in comparison to the top global producers, it ranked as the fifth-largest rice exporter in the world—and the top exporter outside of Asia—throughout 2018–23 (table 2.4). The United States experienced an overall decline in export volumes during this period, particularly in 2022 and 2023. The volume of U.S. rice exports fell by 14 percent overall during 2018–23, from 3.2 million mt in 2018 to 2.8 million mt in 2023 (table 4.2). In contrast, the value of U.S. rice exports increased by 21 percent during the same period, from $1.7 billion in 2018 to $2.0 billion in 2023 (table 4.3) owing to higher global prices for rice.

[181] USITC, *Rice: Global Competitiveness*, April 2015, 122.
[182] Off-farm stocks also include stocks in transit. USDA, NASS, *Rice Stocks*, October 2024, 2.
[183] USDA, NASS, *Rice Stocks*, October 2024, 2.
[184] Total U.S. paddy rice stocks were 6.3 million mt in December 2023, 4.7 million mt in March 2024, 2.7 million mt in June 2024, 1.5 million mt in August 2024, and 222,580 mt in October 2024. USDA, NASS, *Rice Stocks*, October 2024, 2.
[185] Trade data in this section are reported on an actual weight basis, as opposed to a milled rice equivalent basis.

Table 4.2 United States: exports of rice, by trade partner, 2018–23
In thousands of metric tons.

Trade partner	2018	2019	2020	2021	2022	2023
Mexico	755	860	614	765	421	538
Haiti	412	450	461	406	384	375
Japan	274	338	314	314	243	267
Iraq	157	154	0	120	88	219
Canada	227	244	244	242	261	215
Honduras	196	161	124	163	131	210
Colombia	146	152	188	13	165	154
Nicaragua	11	132	92	111	115	116
Saudi Arabia	94	119	116	97	76	86
Guatemala	123	117	84	121	114	85
All others	795	913	1,053	1,060	491	487
Total	3,191	3,642	3,292	3,411	2,489	2,753

Source: S&P Global, Total exports, HS heading 1006, rice, accessed August 2, 2024.

Table 4.3 United States: exports of rice, by trade partner, 2018–23
In thousands of dollars.

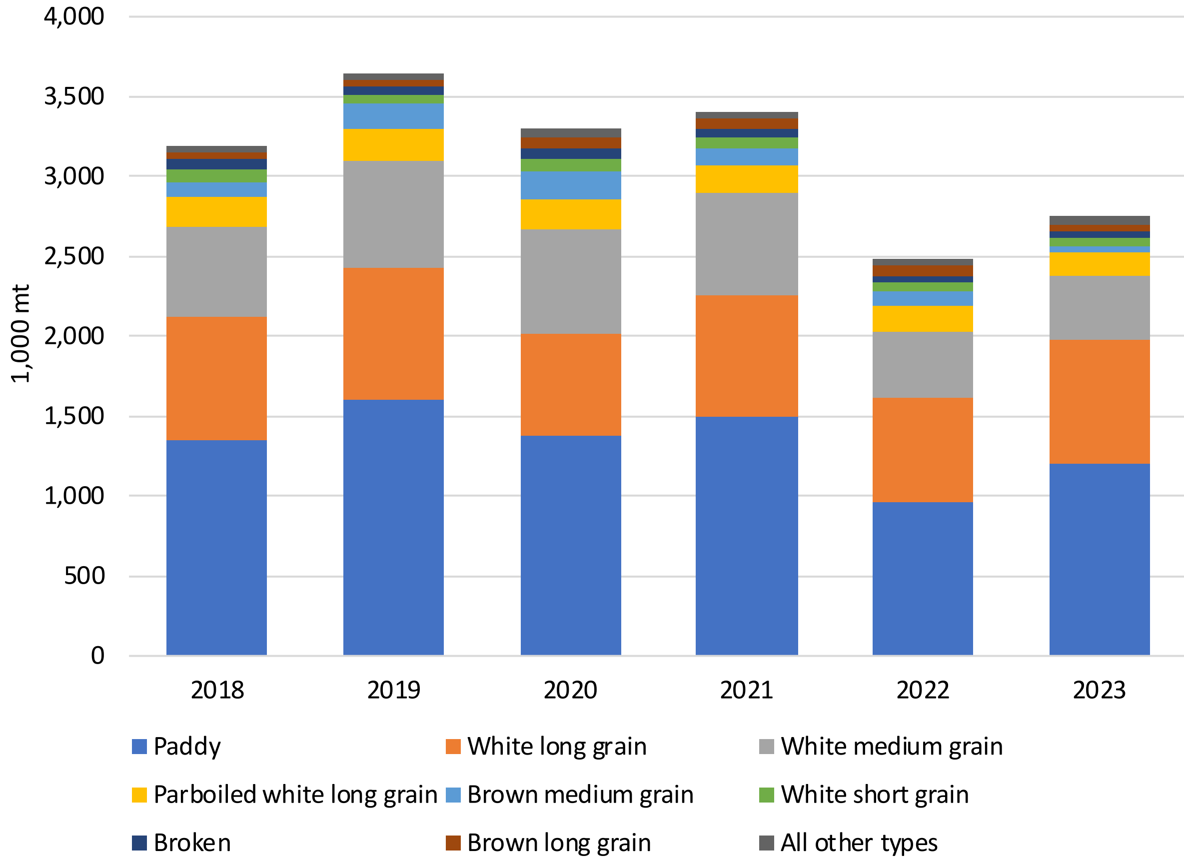
Trade partner	2018	2019	2020	2021	2022	2023
Japan	232,114	275,530	260,687	289,145	293,194	414,015
Mexico	268,219	278,118	245,234	306,484	218,911	281,907
Haiti	206,466	206,200	245,141	223,713	232,052	264,489
Canada	183,315	204,289	203,283	208,455	242,123	213,247
Iraq	88,686	71,710	0	69,576	59,312	149,158
Saudi Arabia	73,109	98,002	105,563	85,717	69,156	87,306
Honduras	60,845	47,016	46,061	53,243	44,730	87,264
South Korea	88,880	120,455	152,716	132,165	118,946	69,878
Colombia	54,375	50,624	65,335	6,494	71,527	60,945
Jordan	65,570	73,311	73,171	64,335	20,962	54,195
All others	369,241	441,424	480,789	512,919	342,085	362,723
Total	1,690,820	1,866,679	1,877,979	1,952,246	1,712,998	2,045,127

Source: S&P Global, Total exports, HS heading 1006, rice, accessed August 2, 2024.

The United States exports paddy rice and several types of milled rice (figure 4.1). During 2018–23, U.S. exports were mainly in the form of paddy rice (43 percent by volume), white long grain rice (24 percent), and white medium grain rice (18 percent). The United States also exported smaller shares of parboiled white long grain rice (6 percent) and brown medium grain rice (4 percent).[186] U.S. exports of other types of rice, including white short grain rice, brown long grain rice, and broken rice, were less than 3 percent each of total U.S. rice exports.[187]

[186] U.S. export shares of the largest categories on a milled rice equivalent basis were 34 percent paddy rice, 27 percent white long grain rice, 20 percent white medium grain rice, 6 percent parboiled white long grain rice, and 4 percent brown medium grain rice.
[187] No other category represented more than 0.5 percent of total U.S. rice exports during 2018–23.

Figure 4.1 United States: exports of rice, by type, 2018–23
In thousands of metric tons (1,000 mt). Underlying data for this figure can be found in appendix F, table F.12.



Source: USITC DataWeb/Census based on Schedule B numbers under Schedule B number 1006, accessed August 21, 2024.

Paddy rice was the largest category of U.S. rice exports during 2018–23, accounting for 43 percent of total exports by volume. The United States is the top global exporter of paddy rice, with most of those exports going to Mexico as well as countries in Central and South America.[188] Aside from the United States, the relatively few other major exporters of paddy rice are primarily South American producers.[189] Other major exporters of rice, such as India, Thailand, Vietnam, Pakistan, and China, have disincentives or restrictions in place for exporting paddy rice, typically to protect their domestic milling industries.[190]

The United States also exports rice of differing grain lengths. White long grain rice and white medium grain rice totaled 24 percent and 18 percent, respectively, of U.S. exports by volume during 2018–23. The top export markets for U.S. white long grain rice over this period were Haiti, Iraq, Canada, Mexico, and the Dominican Republic; the top export markets for U.S. white medium grain rice were Japan, Jordan, Canada, South Korea, and Taiwan. More information on U.S. exports and competitiveness in global markets can be found in chapter 9 of this report.

[188] S&P Global, HS heading 1006, rice, accessed August 2, 2024.
[189] S&P Global, HS heading 1006, rice, accessed August 2, 2024.
[190] USITC, hearing transcript, April 30, 2024, 31 (testimony of Alex Clark, U.S. Rice Producers Association).

U.S. imports of rice displayed steady growth during 2018–23, increasing 49 percent by volume from 896 million mt in 2018 to 1.3 billion mt in 2023 (table 4.4). Similarly, the value of U.S. imports rose from $903 million in 2018 to $1.3 billion in 2023, representing an increase of 45 percent (table 4.5). Despite the overall increase, U.S. imports declined to 957 million mt ($876 million) in 2021, primarily because of a shortage of shipping containers and high freight costs at that time.[191] Overall growth during 2018–23 was largely attributable to increases of U.S. imports from Thailand and India, which are the two largest foreign suppliers of rice to the U.S. market. Between 2018 and 2023, U.S. imports of rice from Thailand and India increased by 51 percent and 61 percent, respectively. Aside from those leading sources, the United States also imported sizable quantities from China, Brazil, Pakistan, and Vietnam.

Table 4.4 United States: imports of rice, by trade partner, 2018–23
In thousands of metric tons.

Trade partner	2018	2019	2020	2021	2022	2023
Thailand	501	573	644	544	752	756
India	179	189	262	202	274	289
China	68	66	66	65	86	85
Brazil	57	44	82	40	44	48
Pakistan	22	27	40	25	25	35
Vietnam	19	17	20	16	24	34
Australia	4	0	0	0	21	18
Argentina	7	7	13	16	19	16
Canada	10	9	9	9	10	10
Italy	10	10	11	8	10	9
All others	18	24	39	32	32	37
Total	896	964	1,188	957	1,296	1,338

Source: S&P Global, General imports, HS heading 1006, rice, accessed August 2, 2024.

Table 4.5 United States: imports of rice, by trade partner, 2018–23
In thousands of dollars.

Trade partner	2018	2019	2020	2021	2022	2023
Thailand	540,224	633,309	694,199	501,248	624,869	665,797
India	210,142	226,251	279,014	204,774	298,993	349,838
Pakistan	31,466	37,955	55,244	33,863	37,975	57,516
China	28,789	23,254	24,307	24,056	32,933	44,661
Brazil	22,449	19,387	39,127	18,842	21,656	28,625
Vietnam	12,433	11,336	13,844	12,179	18,570	27,232
Italy	13,207	14,368	17,273	13,399	17,516	21,785
Canada	12,558	11,597	12,516	13,235	15,716	20,789
Australia	3,715	193	366	223	23,981	20,043
Argentina	5,406	5,535	10,836	14,200	17,745	15,491
All others	22,957	30,529	40,307	40,343	47,860	56,421
Total	903,346	1,013,715	1,187,035	876,363	1,157,815	1,308,196

Source: S&P Global, General imports, HS heading 1006, rice, accessed August 2, 2024.

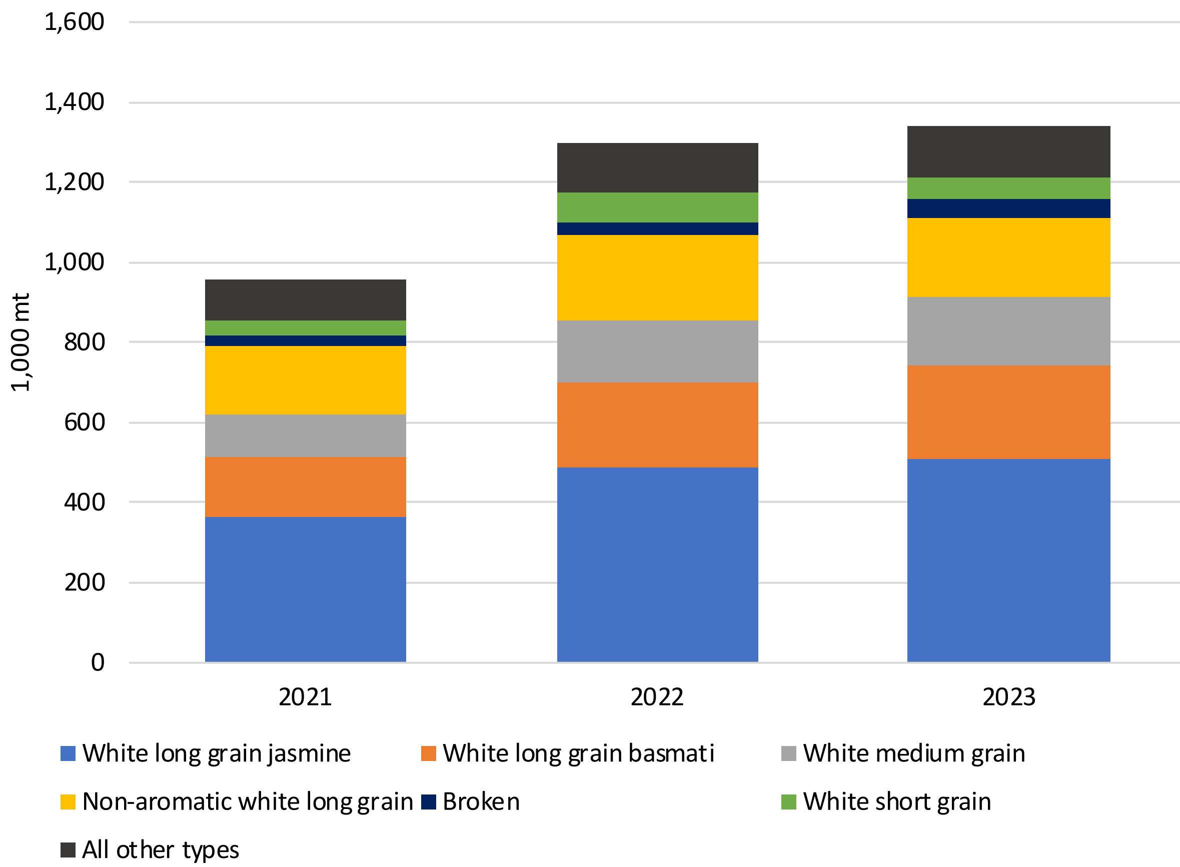
[191] USDA, ERS, *Rice Outlook: December 2021*, December 13, 2021, 3.

As shown in figure 4.2, the United States imports several types of rice. During 2021–23,[192] U.S. imports of rice were mainly in the form of white long grain jasmine rice (38 percent by volume), white long grain basmati rice (17 percent), white medium grain rice (16 percent), and nonaromatic white long grain rice (12 percent). The United States also imported smaller shares of broken rice (5 percent) and white short grain rice (3 percent). U.S. imports of other types of rice, including parboiled white long grain rice, rice of mixed grain lengths, and organic rice, were less than 2 percent each of total U.S. rice imports.

Aromatic rice was the largest category of U.S. rice imports during 2018–23, representing 55 percent of total imports by volume. Virtually all U.S. imports of white long grain jasmine rice were supplied by Thailand, and the vast majority of U.S. imports of white long grain basmati rice were supplied by India.

Figure 4.2 United States: imports of rice, by type, 2021–23

In thousands of metric tons (1,000 mt) Underlying data for this figure can be found in appendix F, table F.13.



Source: USITC DataWeb/Census based on HS subheadings under HS heading 1006, accessed August 21, 2024.

[192] Import data presentations in this section that include breakouts for aromatic rice are limited to the 2021–23 period to account for changes in the HTS that now capture volumes of aromatic rice varieties, which account for more than half of U.S. imports. Effective July 1, 2020, HTS statistical reporting numbers 1006.20.4020 (brown long grain) and 1006.30.9055 (white long grain) were discontinued and replaced with 1006.20.4025 (brown long grain basmati), 1006.20.4035 (other brown long grain), 1006.30.9057 (white long grain jasmine), 1006.30.9059 (white long grain basmati), and 1006.30.9061 (nonaromatic white long grain). USITC, Change Record (Rev. 14). July 8, 2020.

Industry Structure

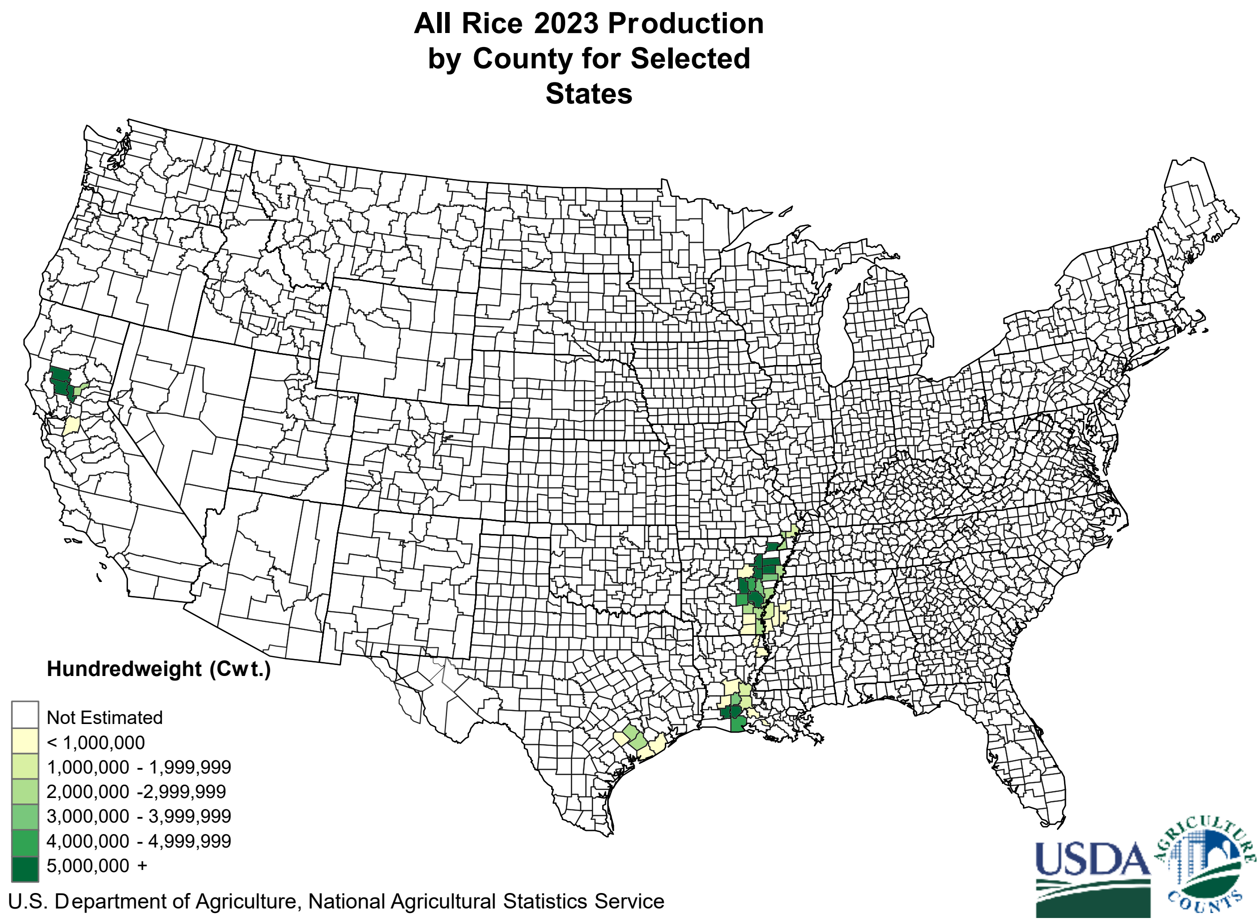
Geography

Rice cultivation is limited to specific geographic areas within the United States, owing to certain agronomic conditions, including access to a reliable supply of water, a uniform land surface for the even distribution of water and effective drainage, and warm temperatures during the growing season.[193] Soil and climate conditions further influence the types of rice that are grown among these regions, which are broadly grouped together as the Southern regions and California (figure 4.3).[194]

[193] USDA, ERS, *U.S. Rice Production in the New Millennium: Changes in Structure, Practices, and Costs*, December 2018, 2; USITC, hearing transcript, April 30, 2024, 22 (testimony of K. Bradley Watkins, University of Arkansas System Division of Agriculture).

[194] The six major rice-producing states are Arkansas, California, Louisiana, Mississippi, Missouri, and Texas. In addition, Florida produces 20,000–25,000 acres of rice annually. The majority of this is grown by Florida Crystals Corporation, which primarily grows and processes sugarcane. The company grows rice in the fallow year before planting a new sugarcane crop. USA Rice, "Sunshine State Rice," March 28, 2024; USDA, NASS, Charts and Maps, accessed October 14, 2024.

Figure 4.3 United States: rice production for selected states, by county, 2023



Source: USDA, NASS, Charts and Maps, accessed October 14, 2024.

The Southern regions include the Arkansas Grand Prairie, the Mississippi River Delta (which includes parts of Arkansas, Louisiana, Mississippi, and Missouri), and the Gulf Coast (which includes parts of Louisiana and Texas). Collectively, the Southern regions contribute over 80 percent of total rice production in the United States (table 4.6). Most of the varieties grown in the Southern regions are long grain rice, which is the largest category of rice grown in the United States. Arkansas is the leading rice-producing state, representing about half of total U.S. rice production, followed by California (18 percent) and Louisiana (16 percent). Most of California's rice production is concentrated in the Sacramento Valley—representing 95 percent of the state's rice crop—with the remainder grown in the northern part of the San Joaquin Valley.[195]

[195] University of California, Davis, *Rice Production Manual*, 2023, 3.1; University of California, Davis, "About California Rice," accessed November 4, 2024.

Table 4.6 United States: rice production, by rice type and state, 2023

In metric tons (mt), hectares (ha), dollars ($), and percentages (%).

Product	Type	Arkansas	California	Louisiana	Missouri	Texas	Mississippi	U.S. total
Area harvested (1,000 ha)	Long grain	492	4	157	78	49	49	828
Production (1,000 mt)	Long grain	4,691	30	1,349	785	506	455	7,817
Share of long grain production (%)	Long grain	60	0	17	10	6	6	100
Area harvested (1,000 ha)	Medium grain	81	197	30	3	9	0	321
Production (1,000 mt)	Medium grain	740	2,145	248	27	51	0	3,211
Share of medium grain production (%)	Medium grain	23	67	8	1	2	0	100
Area harvested (1,000 ha)	All types	574	207	187	81	58	49	1,156
Production (1,000 mt)	All types	5,434	2,234	1,597	812	557	455	11,089
Production ($1,000)	All types	1,679,398	1,468,631	518,612	246,169	193,107	142,528	4,248,445
Share of total production volume (%)	All types	50	18	16	7	5	4	100
Share of total production value (%)	All types	40	35	12	6	5	3	100

Source: USDA, NASS, Crop Production 2023 Summary, January 2024; USDA, NASS, Crop Values 2023 Summary, February 2024.

Note: Production data for short grain rice are not presented because this category composed less than 1 percent of total U.S. rice production. U.S. production of short grain rice, which is predominantly concentrated in California, was 61,000 mt in 2023.

U.S. production of rice by type is closely tied to the state and region in which it is grown. Most rice produced in the United States is long grain rice, accounting for 70 percent of total U.S. rice production in 2023, with medium grain rice (29 percent) and short grain rice (less than 1 percent) making up the balance. U.S. long grain rice production is primarily concentrated in the Southern growing regions; Arkansas produced 60 percent of total U.S. long grain rice in 2023, followed by Louisiana (17 percent) and Missouri (10 percent). U.S. medium grain rice and short grain rice production is primarily concentrated in California, which produced about two-thirds of total U.S. medium grain rice and 95 percent of total U.S. short grain rice in 2023. Most varieties grown in California are medium grain japonica rice that are well suited for temperate regions.[196] Over 80 percent of rice grown in California is Calrose type medium grain, which has low amylose content and is typically soft and sticky when cooked.[197] Arkansas also produces a sizable amount of medium grain rice, accounting for 23 percent of its total crop in 2023, particularly in years when California's medium grain rice acreage is down.[198]

Crop rotation and cultivation practices vary within the U.S. rice-growing regions. For example, many rice farmers in Louisiana co-crop with crawfish, which helps to offset losses when the rice market has a down year by spreading annual fixed costs (e.g., land costs) between commodities.[199] Most farmers in Arkansas grow rice in rotation with other commodity crops such as soybeans and corn, but farmers in California tend to plant rice continuously rather than rotating with other crops.[200] Additionally, although most U.S. rice production involves a single crop harvested each year, some farmers in Texas and southwestern Louisiana are able to harvest a partial second crop from a single planting because of the longer growing season.[201]

Characterization of Farms and Mills

Rice farms in the United States have consolidated into larger operations over the last few decades, evidenced by the decline in the number of rice farms alongside an increase in harvested rice acres. This trend has continued in recent years. According to the USDA Census of Agriculture, the number of rice farms in the United States fell from 4,637 in 2017 to 3,824 in 2022, representing a decrease of 17.5 percent.[202] At the same time, harvested rice acres per farm increased by 15.3 percent from 517 in 2017 to 596 in 2022.[203] More than 70 percent of U.S. rice farms operating in 2022 were larger than 500 acres, and more than 40 percent were larger than 2,000 acres.[204]

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[196] University of California, Davis, *Rice Production Manual*, 2023, 3.1.
[197] University of California, Davis, *Rice Production Manual*, 2023, 3.8.
[198] USDA, ERS, "Rice Sector at a Glance," September 27, 2023.
[199] Industry representative, interview by USITC staff, July 29–August 1, 2024; USDA, ERS, *U.S. Rice Production in the New Millennium: Changes in Structure, Practices, and Costs*, December 2018, 17.
[200] Only a small portion of acreage in Arkansas continually plants rice. This land is flat, low-lying, and remains saturated for much of the year—conditions that are not conducive for growing other crops. Held, "What You Need to Know About the Environmental Impacts of Rice Production," October 1, 2021.
[201] This partial second crop, also called a "ratoon" crop, is grown by reflooding the stubble remaining in the field after the initial harvest. USDA, ERS, "Rice Sector at a Glance," September 27, 2023; Industry representative, interview by USITC staff, July 29–August 1, 2024.
[202] The most recent year covered by the USDA Census of Agriculture, which is released every five years, is 2022. USDA, NASS, *2022 Census of Agriculture*, February 2024, 4.
[203] USDA, NASS, *2022 Census of Agriculture*, February 2024, 4.
[204] USDA, NASS, *2022 Census of Agriculture*, February 2024, 110–11.

The U.S. rice milling sector is highly concentrated, and large shares of the total U.S. rice crop flows through mills operating under farmer-owned cooperatives. In Arkansas, about 60 percent of the rice crop is milled by two farmer cooperatives.[205] In California, one farmer cooperative mills an estimated 20 percent of the rice crop.[206] The last five years have seen a growing trend of smaller on-farm mills coming online in the United States.[207] These on-farm mills allow for greater control over the rice throughout the milling and marketing process.[208] Generally, these smaller mills have limited capacity for expansion and serve niche markets.[209]

Domestic Shipments

U.S. rice is sold into several marketing channels, including retail grocery outlets, food service establishments, industrial food processors, and for export. A survey of 21 firms (representing 31 rice mills) shows that in MY 2021/22, nearly two-thirds of U.S. milled rice shipments were shipped domestically and the remainder were exported.[210] About 60 percent of total domestic shipments went to direct food use, and the balance went to industrial food processing.[211] Foodservice was the largest segment of the direct food use market domestically, representing 29 percent of those shipments, followed by retail outlets (28 percent) and ethnic distributors (25 percent).[212] Of domestic shipments for industrial food processing, about 45 percent was used in the production of processed foods for human consumption, 28 percent was used for pet food, and 27 percent was used for beverages (e.g., beer and sake).[213] Demand for rice in industrial food processing is increasing as the United States shifts away from wheat and corn to rice as an ingredient in food products because of health perceptions, including a desire for more gluten-free food products.[214]

The food service market segment mainly procures long grain rice and parboiled rice. Retail outlets primarily buy long grain rice and value-added products (e.g., blends and seasoned rice), and ethnic distributors mainly buy medium and short grain rice.[215] Industrial food processors, which use rice as an

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[205] Industry representatives, interview by USITC staff, May 1, 2024.
[206] Industry representative, interview by USITC staff, August 26–28, 2024.
[207] USITC, hearing transcript, April 30, 2024, 76 (testimony of Peter Bachmann, USA Rice Federation).
[208] USITC, hearing transcript, April 30, 2024, 77 (testimony of Peter Bachmann, USA Rice Federation); USITC, hearing transcript, April 30, 2024, 77–79 (testimony of Kirk Satterfield, USA Rice Federation).
[209] USITC, hearing transcript, April 30, 2024, 79 (testimony of Alex Clark, U.S. Rice Producers Association); Industry representative, interview by USITC staff, July 29–August 1, 2024.
[210] Some of the firms surveyed represent multiple rice mills. USA Rice, *U.S. Rice Domestic Usage Report for the Marketing Year 2021–2022*, 3–4.
[211] USA Rice, *U.S. Rice Domestic Usage Report for the Marketing Year 2021–2022*, 5.
[212] Food service includes commercial and noncommercial food service operations and distributors, such as Sysco. Retail includes all mainstream retail outlets, including grocery chains, wholesale distributors, and supercenters. Ethnic distributors include organizations, such as JFC International or Nishimoto, that purchase rice for repackaging or resale to ethnic grocery stores or restaurants. The remainder of domestic shipments for direct food use went to repackers (8 percent), warehouse clubs (8 percent), and USDA feeding programs and the military (2 percent). USA Rice, *U.S. Rice Domestic Usage Report for the Marketing Year 2021–2022*, 5, 42.
[213] USA Rice, *U.S. Rice Domestic Usage Report for the Marketing Year 2021–2022*, 31.
[214] Industry representative, interview by USITC staff, August 26–28, 2024.
[215] USA Rice, *U.S. Rice Domestic Usage Report for the Marketing Year 2021–2022*, 26–27.

ingredient in products such as baby food, beer, or cereal, primarily purchase broken rice and long grain rice.[216]

Government Programs

U.S. farm policy and government support programs for rice are largely established in U.S. farm bills.[217] Farm bills contain several different categories for support, including programs that are funded through the Commodity Credit Corporation for commodity and income support, natural resources conservation, export promotion, and international food aid. These support programs provide U.S. farmers with additional risk management tools to mitigate losses during periods of low yields or low prices. Government expenditures to implement farm bill programs are notified to the World Trade Organization, as required by the Agreement on Agriculture. In the most recent notification, for MY 2022/23 (October 1, 2022 to September 30, 2023), direct support to rice producers amounted to $353 million, almost 11 percent of the value of rice production, made up of payments provided under the one-time Rice Production Program (described in this section), as well as subsidies on commodity loan interest payments and crop insurance premiums.[218]

The Agricultural Act of 2014 authorized several commodity support programs, including the Agriculture Risk Coverage program and the Price Loss Coverage (PLC) program, which were reauthorized under the Agriculture Improvement Act of 2018.[219] The Agriculture Risk Coverage and PLC programs provide income support to farmers to mitigate revenue risk and price risk, respectively.[220] Under the Agricultural Act of 2014, farmers who participated were required to choose between the two programs and were locked into that choice for the duration of that farm bill.[221] This changed under the Agriculture Improvement Act of 2018—program election was fixed for the first two years (2019 and 2020), and farmers were able to choose between the two programs on an annual basis thereafter.[222] For the 2018–22 program years, most rice farmers with enrolled base acres opted for the PLC program.[223] PLC program payments are issued when the effective price of a commodity is less than the respective effective

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216 USA Rice, *U.S. Rice Domestic Usage Report for the Marketing Year 2021–2022*, 31.
217 Farm bills are omnibus, multiyear pieces of legislation governing agricultural and food programs that are renewed roughly every five years. The farm bills most relevant to the study period are the Agricultural Act of 2014 and the Agriculture Improvement Act of 2018. The Agriculture Improvement Act of 2018 was extended by the Further Continuing Appropriations and Other Extensions Act, 2024 (through September 30, 2024) and the American Relief Act, 2025 (through September 30, 2025).
218 WTO, Committee on Agriculture, "United States: Domestic Support Notification, 2023," G/AG/N/USA/173 September 9, 2024.
219 Agricultural Act of 2014, Pub. L. No. 113-79, § 1116, 128 Stat. 649, 668 (2014); Agricultural Act of 2014, Pub. L. No. 113-79, § 1117, 128 Stat. 649, 669 (2014); Agriculture Improvement Act of 2018, Pub. L. No. 115-334, § 1106, 132 Stat. 4490, 4504 (2018); Agriculture Improvement Act of 2018, Pub. L. No. 115-334, § 1107, 132 Stat. 4490, 4505 (2018).
220 USDA, FSA, "Agriculture Risk Coverage (ARC) & Price Loss Coverage (PLC)," accessed November 25, 2024.
221 Agricultural Act of 2014, Pub. L. No. 113-79, § 1115, 128 Stat. 649, 667 (2014).
222 Agriculture Improvement Act of 2018, Pub. L. No. 115-334, § 1105, 132 Stat. 4490, 4503 (2018); USDA, ERS, *Federal Programs for Agricultural Risk Management*, December 2023, 2–3.
223 USDA, ERS, *Federal Programs for Agricultural Risk Management*, December 2023, 9.

reference price for that commodity.[224] Rice payments under the PLC program totaled $384 million for the 2019 program year, $275 million for the 2020 program year, and $77 million for the 2021 program year.[225]

In response to higher production costs during 2022, the Rice Production Program, administered by the USDA Farm Service Agency, provided one-time payments to rice farmers based on reported 2022 planted and prevented planted acres. The program was established specifically to provide financial assistance to farmers in response to higher production costs in 2022. Funding for the Rice Production Program, totaling $250 million, was provided for in The Consolidated Appropriations Act, 2023.[226]

The U.S. rice industry also benefited from two international trade promotion programs that are administered by the USDA Foreign Agricultural Service: the Foreign Market Development (FMD) program and the Market Access Program (MAP).[227] In fiscal year (FY) 2024, the U.S. rice industry received $1.5 million from the FMD program out of the total allotment of $27 million for all agricultural products.[228] This program helps create, expand, and maintain long-term export markets for U.S. agricultural products.[229] Similarly in FY 2024, the U.S. rice industry received $3.3 million from MAP out of the total allotment of $174 million for all agricultural products.[230] MAP is a cost-share program for overseas marketing and promotional activities that help build commercial export markets for U.S. agricultural products.[231] The U.S. rice industry received similar funding allocations through the FMD program and

[224] The Agriculture Improvement Act of 2018 introduced the effective reference price, which allows the trigger for program payments to adjust upward under certain market conditions. The effective price equals the higher of the national marketing year average price or the national average loan rate for the covered commodity. The effective reference price is the lesser of 115 percent of the reference price or an amount equal to the greater of the reference price or 85 percent of the average of prices from the five preceding marketing years, excluding the highest and lowest price. The new method of calculating the PLC program payment rates allows the effective reference price to be greater than the statutory reference price if the historic average of marketing year average prices is greater than the statutory reference price. The statutory reference prices for rice under the Agriculture Improvement Act of 2018 are $14.00 per hundredweight for long grain rice, $14.00 per hundredweight for medium and short grain rice (grown in the Southern regions), and $17.30 per hundredweight for temperate Japonica rice (grown in California). Agriculture Improvement Act of 2018, Pub. L. No. 115-334, § 1101, 132 Stat. 4490, 4500 (2018); USDA, FSA, "Agriculture Risk Coverage (ARC) and Price Loss Coverage (PLC) Enrollment Overview," October 2022.
[225] USDA, FSA, "Price Loss Coverage (PLC) Payments by Crop and by State for Program Years 2019 - 2022 as of 10/28/2024," October 28, 2024.
[226] Notice of Funding Availability (NOFA) for the Rice Production Program, 88 Fed. Reg. 30070 (May 10, 2023); USDA, FSA, "Rice Production Program," accessed November 7, 2024.
[227] Agriculture Improvement Act of 2018, Pub. L. No. 115-334, § 3201, 132 Stat. 4490, 4608 (2018).
[228] USDA, FAS, "FMD Funding Allocations - FY 2024," accessed October 23, 2024.
[229] Through the FMD program, the USDA Foreign Agricultural Service partners with U.S. agricultural producers and processors who are represented by nonprofit commodity or trade associations. For rice, the FMD program partner during the FY 2018–23 period was the USA Rice Federation. USDA, FAS, "Foreign Market Development Program (FMD)," accessed October 25, 2024; See generally USDA, FAS, "FMD Funding Allocations," accessed November 7, 2024.
[230] USDA, FAS, "MAP Funding Allocations - FY 2024," accessed November 7, 2024.
[231] Through MAP, the USDA Foreign Agricultural Service partners with U.S. agricultural trade associations, cooperatives, state and regional trade groups, and small businesses. For rice, MAP partners during the FY 2018–23 period were the USA Rice Federation and the U.S. Rice Producers Association. USDA, FAS, "Market Access Program (MAP)," accessed November 7, 2024.

MAP during FY 2018–23.[232] Rice exporters have also benefited from the Export Credit Guarantee program, which provides competitive credit terms to buyers, mainly in developing countries, by reducing financial risk to lenders through credit guarantees.[233]

Additionally, government support is aimed at promoting exports of U.S. agricultural products to markets with increasing consumer demand and purchasing power. In 2023, the USDA Foreign Agricultural Service established the Regional Agricultural Promotion Program in response to a request from the U.S. Senate Committee on Agriculture, Nutrition, and Forestry.[234] The program uses Commodity Credit Corporation funding to support efforts to diversify and expand market opportunities for U.S. agricultural products, focusing on diverse and nontraditional markets in Africa, Latin America, the Middle East, South Asia, and Southeast Asia.[235] The U.S. rice industry received $7.6 million from the Regional Agricultural Promotion Program for FY 2024 and an additional $7.6 million for FY 2025 to support these activities.[236]

A small share of U.S. rice exports (approximately 2–5 percent) is shipped in the form of international food aid through programs administered by the U.S. Agency for International Development and the USDA.[237] These programs, which include Food for Peace Program, Food for Progress Program, and McGovern-Dole International Food for Education and Child Nutrition Program, purchase milled rice from the U.S. rice industry for distribution overseas.[238] In FY 2024, the U.S. industry supplied 161,000 mt of rice—bulk, bagged, fortified, and regular milled—to these programs, the highest volume in nearly 15 years.[239] Fortified rice is milled rice that has been further enriched with micronutrients. According to U.S. industry representatives, fortification has been well received by the broader food aid community and is increasingly being used in some of these programs.[240] Although food aid accounts for a modest portion of total U.S. rice exports, sales to these programs can be particularly beneficial to the industry in periods when commercial exports are down.[241]

Finally, U.S. rice growers benefit from a number of conservation programs that support a range of efforts on working lands from improving wildlife habitat to better managing water resources.[242] Additionally, in September 2022, the USDA announced that the U.S. rice industry was eligible to receive funding through

[232] See generally USDA, FAS, "FMD Funding Allocations," accessed November 7, 2024; See generally USDA, FAS, "MAP Funding Allocations," accessed November 7, 2024.
[233] USDA, FAS, "Export Credit Guarantee Program (GSM-102)," accessed November 4, 2024.
[234] Regional Agricultural Promotion Program, 88 Fed. Reg. 80092 (November 17, 2023) (codified at 7 C.F.R. pt. 489).
[235] The Regional Agricultural Promotion Program focuses on regions where the middle class and demand for high-quality agricultural products is growing. The current top export markets for U.S. agricultural products—China (including Hong Kong and Macau), Canada, Mexico, and the European Union—are ineligible for the initial tranche of program funding because the stated goal is to "diversify and expand market opportunities for U.S. food and agricultural products beyond the traditional top customers."USDA, FAS, "Regional Agricultural Promotion Program (RAPP)," accessed November 2, 2024; USDA, "USDA Announces Opening of Application Period for Regional Agricultural Promotion Program," November 29, 2023.
[236] USDA, FAS, "RAPP Funding Allocations - FY 2024," accessed October 23, 2024; USDA, FAS, "RAPP Funding Allocations - FY 2025," accessed December 30, 2024.
[237] USA Rice, "Food Aid," accessed October 7, 2024.
[238] USAID, "Office of Food for Peace," accessed November 7, 2024; USDA, FAS, "Food for Progress," accessed November 7, 2024; USDA, FAS, "McGovern-Dole Food for Education Program," accessed November 7, 2024.
[239] USA Rice, "U.S. Rice Supplies Global Food Aid in Record Numbers," October 1, 2024.
[240] USA Rice, "Food Aid: Fortified Rice," accessed January 30, 2025.
[241] USITC, hearing transcript, April 30, 2024, 81–82 (testimony of Peter Bachmann, USA Rice Federation).
[242] USA Rice, "Conservation Programs," accessed November 8, 2024.

its Partnership for Climate-Smart Commodities to support the implementation of sustainable production practices.[243]

Factors Affecting Competitiveness

The United States is a reliable supplier of rice, both domestically and abroad, owing to its advanced production systems that maintain high yields. U.S. competitiveness in certain export markets is strengthened by efficient transportation logistics that offer consistent, timely delivery and offset high production costs. Additionally, tariff preferences with key markets improve the price competitiveness of U.S. exports. Some of these advantages, however, have eroded in recent years as similar tariff preferences were extended to competing producers and some Latin American markets raised concerns regarding certain quality attributes of U.S. rice. Finally, although the United States supplies most of its own consumption, it has been largely unable to compete with imports of aromatic varieties, which represent a growing segment of the domestic market.

High Costs of Production

Growers in the United States face high costs of production for their rice cultivation, and these costs increased over the 2018–23 period. The national average of production costs increased by 39 percent from $976 per acre in 2018 to $1,355 per acre in 2023.[244] Nearly all aspects of operating and overhead costs went up over this period. In the Southern regions, costs increased considerably for fertilizer, chemicals, fuel/electricity, repairs, and commercial drying.[245] In California, where production costs are highest among the U.S. rice-growing regions, the costs for fertilizer, chemicals, and fuel/electricity more than doubled between 2018 and 2023.[246] These high production costs have implications for the United States' ability to compete in certain export markets.

Due to high production costs, the U.S. rice industry focuses efforts on certain export markets where it is better able to compete. California growers export primarily to markets in East Asia, including Japan, South Korea, and Taiwan, where they face lower competition from other suppliers and receive greater returns for their medium grain rice which offset the high production costs.[247] These East Asian markets, particularly Japan and South Korea, are important for California growers because they have demand for medium grain rice (which is produced by fewer countries than long grain rice) and are willing to pay for quality.[248] Even when California's crop declined due to severe drought, these markets were prioritized in large part because of the higher returns for farmers.[249] Medium grain rice from California is also

[243] USA Rice, "USA Rice Receives Major Climate Smart Grant from USDA," accessed November 8, 2024.
[244] USDA, ERS, "Rice Production Costs and Returns per Planted Acre, Excluding Government Payments," October 1, 2024.
[245] USDA, ERS, "Rice Production Costs and Returns per Planted Acre, Excluding Government Payments," October 1, 2024.
[246] USDA, ERS, "Rice Production Costs and Returns per Planted Acre, Excluding Government Payments," October 1, 2024.
[247] Industry representative, interview by USITC staff, August 26–28, 2024; U.S. government official, interview by USITC staff, March 26, 2024.
[248] U.S. government official, interview by USITC staff, March 26, 2024.
[249] Industry representative, interview by USITC staff, August 26–28, 2024; industry representative, interview by USITC staff, August 26–28, 2024.

exported to markets in the Middle East, which are reportedly price sensitive, but exhibit a preference for California medium grain rice.[250]

Paddy rice and long grain rice grown in the Southern regions is exported predominantly to markets within the Western Hemisphere, where the United States primarily competes with other regional producers, including Brazil, which also has a relatively high cost of production (see table 3.2). The United States is particularly competitive in the Western Hemisphere's paddy rice market. Paddy rice accounts for roughly one-third of the region's rice imports, which is distinct compared to other regions that import larger shares of milled rice.[251] Demand for paddy rice is high in the Western Hemisphere because several countries within the region prefer to purchase paddy rice and then capture the added value by milling the rice locally.[252]

In contrast, the United States is not competitive with several Asian suppliers that offer rice at lower prices.[253] For example, the United States remains price uncompetitive in sub-Saharan Africa, the world's largest and fastest-growing regional market for rice. This region's growing demand is primarily supplied by lower-grade rice from Thailand, India, Vietnam, and Pakistan that is sold at much lower prices than U.S. long grain rice.[254]

Efficient Transportation Logistics

Even though the United States has high costs of production, the delivered cost of U.S. rice is competitive in certain markets owing to geographic proximity and efficient transportation logistics that offer consistent and timely delivery. Relative to other rice producers, the United States maintains a robust infrastructure and transportation network that facilitates efficient shipping of agricultural products. Much of the U.S. rice destined for export markets is transported on barges through the Mississippi River's inland waterways to ports situated along the Gulf Coast, providing a low-cost transportation option for bulk shipments.[255] Both paddy rice and milled rice can be shipped in bulk, with the rice being milled and/or bagged upon arrival in import markets.[256]

Owing to these efficient and cost-effective transportation logistics, the U.S. industry maintains a competitive edge with its ability to provide "just in time" delivery of rice to key regional markets via bulk shipments.[257] The United States also holds the reputation of being a reliable trading partner in the global rice market. An industry representative from a grain merchandising company explained that executing a trade depends on the reliability of firms and contracts, and the U.S. rice industry excels in this regard.[258]

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[250] Industry representative, interview by USITC staff, August 26–28, 2024.
[251] USDA, FAS, *Grain: World Markets and Trade*, February 2024, 10.
[252] USDA, FAS, *Grain: World Markets and Trade*, February 2024, 10.
[253] U.S. government official, interview by USITC staff, March 26, 2024.
[254] USDA, ERS, *A Deeper Look Into the USDA Crop Baseline Projections, With a Focus on Trade*, November 2019, 30.
[255] Kennedy, "Agricultural Trade and the Ports of South Louisiana," June 4, 2018.
[256] Industry representative, interview by USITC staff, August 26–28, 2024; Tomson, "Conditions Deteriorate for US Rice Exports to Haiti," August 3, 2023.
[257] Industry representative, interview by USITC staff, August 26–28, 2024.
[258] Industry representative, interview by USITC staff, July 29–August 1, 2024.

Tariff Preferences in Key Markets

Because the United States has a relatively high cost of production, its ability to compete in price-sensitive markets depends on the logistics advantages described above, as well as tariff preferences in key markets. Under the USMCA and CAFTA-DR, the United States has tariff preferences with several countries in the Western Hemisphere that import large quantities of paddy rice and long grain rice. These tariff preferences strengthen the competitiveness of U.S. suppliers in these markets, though this advantage has diminished in recent years, particularly in paddy rice markets.

Historically, the United States supplied most of Latin America's demand for paddy rice. Paddy rice suppliers in the United States are well positioned to meet this demand owing to their geographic proximity and efficient transportation logistics as noted above, and tariff advantages with most of the countries that import large quantities of paddy rice.[259] However, in recent years, these tariff advantages have been extended to other regional suppliers, which undermines a key aspect of U.S. competitiveness in the paddy rice market. For example, in May 2022, Mexico—the largest global importer of paddy rice—temporarily lifted import tariffs on staple food items, including rice, for all countries.[260] This action was later extended through the end of 2024.[261] As a result, Brazil was able to capture significant market share in Mexico, accounting for 55 percent of Mexico's paddy rice imports during 2022.[262] Brazil's market gain largely came at the expense of the United States, which has tariff-free access to the Mexican rice market under USMCA. As a result of tariff preference erosion, the United States saw its market share fall from between 83 and 100 percent during 2018–21 to 45 percent in 2022.[263]

Similarly, in 2022, Costa Rica reduced its import tariffs for rice from all origins, eroding the U.S. rice industry's tariff preferences under CAFTA-DR.[264] These tariff preferences made the United States a price competitive supplier of rice to the Costa Rican market, where importers have historically preferred rice from South American suppliers due to consumer preferences for rice that is "less sticky" than U.S. rice.[265] During 2018–21, the United States supplied between 64,000 mt and 75,000 mt of paddy rice to Costa Rica annually.[266] Following the tariff reductions, U.S. paddy rice exports to Costa Rica fell sharply to 31,000 mt in 2022 and 10,000 mt in 2023 as they were largely replaced by competing suppliers from Brazil and Uruguay.[267]

[259] USDA, FAS, *Grain: World Markets and Trade*, November 2023, 8.
[260] USA, FAS, *Grain and Feed Update*, June 24, 2022, 6.
[261] USDA, FAS, *Grain and Feed Update*, January 25, 2024, 18.
[262] S&P Global, HS heading 1006, rice, accessed August 2, 2024.
[263] S&P Global, HS heading 1006, rice, accessed August 2, 2024.
[264] Industry representative, interview by USITC staff, August 26–28, 2024; USDA, FAS, *CORRECTED Costa Rica Rice Situation Update*, August 30, 2023, 2.
[265] USDA, FAS, *CORRECTED Costa Rica Rice Situation Update*, August 30, 2023, 2.
[266] S&P Global, HS heading 1006, rice, accessed August 2, 2024.
[267] S&P Global, HS heading 1006, rice, accessed August 2, 2024. For more information on competition between rice from the United States and other countries in the Mexican and Costa Rican markets, see chapter 9.

Use of Hybrid Varieties at the Expense of Milling Quality

Hybrid varieties of long grain rice have become increasingly prevalent in the Southern regions over the last few decades. First introduced for commercial use in the United States during the early 2000s, hybrid varieties quickly gained traction among growers because they produce higher field yields than conventional varieties.[268] Field yield is an important factor for farmers when deciding what types of rice to grow because greater yields help to offset production costs. Additionally, hybrid varieties are reported to fare better against disease compared to conventional varieties, and have lower input costs.[269] By 2013, hybrid rice accounted for 29 percent of total U.S. rice acreage, concentrated in the Southern regions.[270] Industry representatives reported that since then hybrid varieties have continued to maintain a sizable and increasing share of rice acreage in the United States.[271]

Some concerns have been raised in Latin American markets regarding certain quality attributes of U.S. paddy rice sold in the region.[272] Hybrid varieties are reported to have lower milling yields (i.e., more brokens) than conventional varieties, and need to be run through the mill more times to achieve a similar level of quality.[273] Additionally, U.S. farmers in the Southern regions grow many different varieties that are at times comingled in bulk shipments to export markets.[274] This can create variation in the milled grains, rather than a uniform output.[275] Comingling can also lead to variation in cooking characteristics when the mixed varieties have a range of grain lengths and amylose content.[276] The United States has lost market share to competing South American suppliers in markets where some of these quality concerns have been raised.[277] For example, Costa Rican customers have largely switched over to South American suppliers that meet their quality demands, particularly as the tariff changes described in the previous section have made high-quality rice from these suppliers more affordable.[278]

[268] USDA, ERS, *U.S. Rice Production in the New Millennium: Changes in Structure, Practices, and Costs*, December 2018, 16–17.
[269] Industry representative, interview by USITC staff, May 1, 2024.
[270] USDA, ERS, *U.S. Rice Production in the New Millennium: Changes in Structure, Practices, and Costs*, December 2018, 16.
[271] Industry representatives, interviews by USITC staff, July 29–August 1, 2024.
[272] Industry representative, interview by USITC staff, July 29–August 1, 2024; industry representative, email correspondence with USITC staff, December 16, 2024; Fitchette, “Rice Quality at Heart of U.S. Market Share Woes in Latin America,” January 3, 2024.
[273] Industry representatives, interviews by USITC staff, July 29–August 1, 2024; industry representative, email correspondence with USITC staff, December 16, 2024.
[274] Industry representative, email correspondence with USITC staff, December 16, 2024.
[275] USITC, hearing transcript, April 30, 2024, 52–53 (testimony of Peter Bachmann, USA Rice Federation); USITC, hearing transcript, April 30, 2024, 54–55 (testimony of Kirk Satterfield, USA Rice Federation).
[276] Industry representative, email correspondence with USITC staff, December 17, 2024.
[277] Fitchette, “Rice Quality at Heart of U.S. Market Share Woes in Latin America,” January 3, 2024.
[278] Industry representative, email correspondence with USITC staff, December 16, 2024; Fitchette, “Rice Quality at Heart of U.S. Market Share Woes in Latin America,” January 3, 2024.

Limited Production of Aromatic Varieties

As previously described, there is growing demand for aromatic rice in the United States. This growing market segment is predominantly supplied by imports of jasmine rice from Thailand and basmati rice from India. The U.S. industry has worked to develop and market domestically grown aromatic varieties with limited success.[279] While there have been improvements in the quality of aromatic varieties grown in the United States, production levels remain relatively low—an Arkansas mill estimated that aromatic varieties make up less than 1 percent of total U.S. rice production.[280]

Increased production of aromatics in the United States in response to growing consumer demand for these varieties faces a number of hurdles. In particular, high production costs for U.S. aromatic varieties undermine the U.S. industry's ability to scale up their production. U.S. aromatic rice varieties also have lower yields than other rice types. A California mill reported that aromatic varieties grown in the state yield roughly 25–35 percent less than Calrose, resulting in higher unit costs.[281] In addition, aromatic rice must be segregated throughout the drying, milling, and storage stages, yet low volumes of product often do not justify the milling cost of separate production runs.[282] Further, industry representatives reported that while the U.S. industry has worked to develop and market aromatic varieties with limited success, they are still not price competitive with imports.[283] For example, an industry representative noted that jasmine rice grown in California could be up to four times the price of jasmine rice imported from Thailand.[284] This difference discourages further U.S. investment in aromatic production.[285]

[279] Industry representative, interview by USITC staff, July 29–August 1, 2024.
[280] Industry representative, interview by USITC staff, July 29–August 1, 2024.
[281] Industry representative, interview by USITC staff, August 26–28, 2024.
[282] Industry representative, interview by USITC staff, August 26–28, 2024.
[283] Industry representative, interview by USITC staff, August 26–28, 2024; industry representative, interview by USITC staff, July 29–August 1, 2024.
[284] Industry representative, interview by USITC staff, August 26–28, 2024.
[285] Industry representative, interview by USITC staff, August 26–28, 2024.

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USA Rice Federation (USA Rice). "USA Rice Receives Major Climate Smart Grant from USDA." Accessed November 8, 2024. https://www.usarice.com/news-and-events/publications/usa-rice-daily/article.

Chapter 5
South Asia

Summary

Rice is a key food staple and crop across South Asia. The South Asia region contains three of the world's top ten largest rice producers. Production in the region is typically carried out on small farms with low levels of mechanization. Consumption of rice across the region varies. Bangladesh is the one of the world's largest consumers of rice, but Pakistan consumes relatively little of the rice it produces. India is both a major consumer and the largest exporter of rice in the world. Pakistan also exports large quantities of rice. Bangladesh exports small amounts of specialty varieties and imports nonaromatic rice when it has production shortfalls and to control domestic prices. Governments in South Asia place a major emphasis on food security, and rice production and trade policies are a crucial component of their food security strategies. In addition, rice makes up a major portion of government food distribution.

Although each country's rice industry is unique, a few common factors affect the competitiveness of the region in the global rice market. For example, product differentiation through the production of aromatic and specialty varieties is a competitive strength of the region. Conversely, factors that hinder the competitiveness of countries across the region include climate-related disasters, such as floods and droughts; limits on productivity due to small farm sizes; and lack of access to capital. Government policies have a mixed effect on global competitiveness: programs that support farmers and encourage production reduce delivered costs, whereas other measures limit exports and reduce the reliability of supply in the global market. However, many policies that reduce competitiveness in the global market increase competitiveness of an industry within its own domestic market compared to imports.

Regional Overview

South Asia is both a major producer and consumer of rice. India is the region's largest producer by far (table 5.1) and supplies many other countries in the region with rice, often to satisfy food security needs.[286] In marketing year (MY) 2023/24, India contributed 71.7 percent of total rice production in the region, followed by Bangladesh and Pakistan, which were responsible for 19.4 and 5.2 percent of total rice production, respectively. Nepal, Sri Lanka, and Afghanistan together constituted the remaining 3.6 percent of production.

[286] Duggal and Ali, "How Reliant Is the World on Indian Rice Exports?," September 20, 2023; Dhaka Tribune, "Import Duties on Rice Withdrawn to Ensure Adequate Supply," accessed November 1, 2024; Prasain, "Let Them Eat Rice," August 8, 2023; Kumar, "India Feeds Strategic Partners despite Ban on Rice Exports," January 2, 2024; S&P Global, GTAS database, Total exports, HS Heading 1006, rice, accessed various dates.

Table 5.1 South Asia: rice production, marketing years 2018/19–2023/24
In thousands of metric tons, by marketing year.

Country	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
India	116,484	118,870	124,368	129,471	135,755	137,000
Bangladesh	34,909	35,850	34,600	35,850	36,350	37,000
Pakistan	7,202	7,206	8,420	9,323	7,322	9,869
Nepal	3,736	3,697	3,744	3,417	3,654	3,530
Sri Lanka	3,132	3,207	3,390	2,733	2,828	3,332
Afghanistan	229	249	285	271	258	270
Total	165,692	169,079	174,807	181,065	186,167	191,001

Source: USDA, FAS, PSD Online database, accessed March 13, 2024.
Note: The dataset does not include data on rice production in Bhutan and the Maldives, which are also part of the South Asia region.

Producers in South Asia typically produce both aromatic and nonaromatic varieties of rice. The largest quantity of aromatic rice produced by variety is basmati, produced in India, Pakistan, and Nepal.[287] Other specialty aromatic varieties, such as sona masoori, chinigura, kalijira, and kalanamak, are also produced throughout the region.[288] Nonaromatic rice varieties vary widely and include long, medium, and short grain rice suited to the specific microclimate within each country. The processed forms and varieties consumed are similarly varied, with some local markets preferring parboiled rice and others preferring varieties of a certain grain length. Throughout the region, aromatic rice is typically reserved for special occasions.[289]

Of rice producers in the region, only India and Pakistan exported significant quantities of rice (table 5.2). Most other rice producers were net importers.[290] In 2023, India contributed 79.6 percent of exports from the region, followed by Pakistan, which supplied 20.3 percent of exports. India and Pakistan export both aromatic (basmati) and nonaromatic rice (mostly long grain white rice). Although basmati made up a small share of rice production in India and Pakistan, the two countries provided nearly all global basmati exports. The small volume of exports from the rest of South Asia was mostly specialty varieties.

[287] Government of India, MCI, APEDA, "Basmati Rice," accessed August 28, 2024; Government of Pakistan, API, *Rice Paddy Policy Analysis for 2022–23 Crop*, July 2022, 46; Upreti, "The Battle for Geographical Indication Protection of Basmati Rice," May 2023, 719.
[288] *Rice Trader*, "Panel Discussion at the 2024 Global Rice Summit," June 7–8, 2024; *The Times of India*, "The Legend of Kalanamak Rice," July 7, 2024; Saha et al., "Rice Quality and Its Impacts on Food Security and Sustainability in Bangladesh," December 31, 2021, 3.
[289] Industry representative, interview by USITC staff, October 29, 2024; industry representative, interview by USITC staff, October 30, 2024; U.S. government official, interview by USITC staff, November 5, 2024; India Gate, "Understanding the Cultural Significance of Basmati Rice," February 2, 2024.
[290] S&P Global, General imports, HS Heading 1006, rice, accessed various dates.

Table 5.2 South Asia: exports of rice, by major market, 2018–23
In thousands of metric tons.** = rounds to zero.

Country	2018	2019	2020	2021	2022	2023
India	12,006	9,892	14,716	21,477	22,247	17,860
Pakistan	3,932	4,589	3,986	3,986	4,604	4,560
Sri Lanka	5	5	8	7	6	8
Bangladesh	8	9	13	12	13	6
All others	**	**	**	**	**	**
Total	15,952	14,495	18,724	25,483	26,869	22,434

Source: S&P Global, Total exports, HS heading 1006, rice, accessed August 2, 2024; S&P Global, General imports, HS heading 1006, rice, accessed August 2, 2024.
Note: The "All others" row includes Bhutan, the Maldives, and Nepal. Global Trade Atlas did not report exports for Afghanistan; however, import data from all other reporting countries in the Global Trade Atlas indicate that Afghanistan exported a combined total of less than 400 metric tons of rice during 2018–23. Bangladesh exports were also constructed from imports from all other countries.

The rice industries in South Asia are interconnected. India is a major source of rice imports for Bangladesh, Bhutan, Nepal, and Sri Lanka. In 2023, 64.8 percent of Bangladesh's rice imports were sourced from India. In that same year, 99.9 percent of Bhutan's rice imports, 99.9 percent of Nepal's rice imports, and 60.5 percent of Sri Lanka's rice imports were also from India. Pakistan is also a key source of imports for the region, supplying rice to Afghanistan, Bangladesh, and Sri Lanka in 2023.[291] As a result of the regional dependence on India as a major rice supplier, Indian government trade restrictions on rice can influence rice policies and prices throughout the region. For example, when India imposed export restrictions on rice in 2022, South Asian importers of Indian rice—particularly Bhutan, Nepal, and Sri Lanka—closely monitored the potential negative impacts of Indian rice export policies. Bangladesh responded to India's policies by likewise limiting its minimal exports to control domestic rice prices.[292] Overall, India's export restrictions led to increased global prices, which limited South Asian importers' ability to import from sources outside the region.[293]

India

India is a high-volume producer and exporter of basmati and non-basmati rice varieties to the global market. Rice is the main staple food crop grown in India, constituting more than 40 percent of the country's food grain production.[294] India also produces two-thirds of the world's supply of basmati, a differentiated, premium aromatic rice type.[295] Rice is important to India's agricultural economy, and rice exports from India held the largest share of that country's total agricultural exports, making up $11 billion (21 percent) of exports by value during MY 2022/23.[296] In addition, the rice sector is politically powerful in India because of its importance to certain vulnerable populations, as reflected in national

[291] S&P Global, Total exports, HS Heading 1006, rice, accessed various dates.
[292] Karim and Wardad, "Aromatic Rice Exporters Suffer Blow as Govt 'abruptly' Bans Export," October 26, 2023; Kashem and Ali, "Govt Bans Aromatic Rice Export to Control Price," June 30, 2022; Glauber and Mamun, "India's New Ban on Rice Exports," July 25, 2023.
[293] Glauber and Mamun, "India's New Ban on Rice Exports," July 25, 2023.
[294] USDA, FAS, *Grain and Feed Annual: India*, March 29, 2024, 14.
[295] Government of India, MHFW, "First time in India, FSSAI notifies comprehensive regulatory standards," January 12, 2023.
[296] IBEF, "India," October 2024.

law.[297] The Indian government uses a range of policy strategies to control domestic rice prices and supplies, including producer and consumer supports as well as trade policies.

Production

India is consistently one of the top rice-producing countries in the world. In 2023, India was the second largest global producer of rice after China, making up 26 percent of global production.[298] From MY 2018/19 to MY 2023/24, India expanded production by 18.3 percent, ending the period at 137 million metric tons (mt), an absolute increase of 21 million mt (table 5.3).[299] Indian rice production is divided into two categories, as described in India's policy documents and tariff schedule: basmati and non-basmati. Basmati is an aromatic long grain rice grown in the specific geographical region of the Himalayan foothills, whereas non-basmati rice encompasses all other rice grown throughout India, including local and specialty varieties.[300] Basmati rice is typically 7.20 to 8.25 millimeters (mm) in grain length, and it is used domestically for festival dishes, such as biryani, pongal, kheer, and various sweets.[301] The most common non-basmati rice in India is nonaromatic long grain white rice (described throughout the report simply as long grain rice), which is used to accompany everyday lentil dishes, such as dal.[302] IR64 is one of the most exported varieties; it is nonaromatic and 5.6 to 6.2 mm in length.[303] However, India has other non-basmati varieties that include short and medium grain white rice as well as specialty aromatic types.[304] In MY 2023/24, non-basmati white rice composed an estimated 93 percent of total Indian production of rice; basmati rice made up the remaining 7 percent, about 10 million mt of rice.[305] Across the country, specialty rice varieties are produced for export and local consumption. A few of these, such as sona masoori, an aromatic type, are marketed and sold at a premium price.[306]

[297] In addition to rice, wheat and coarse grains are also specifically mentioned by the National Food Security Act of 2013. Government of India, DFPD, "NFSA," July 15, 2013; National Food Security Act of 2013, § 3(2) (September 10, 2013).
[298] USDA, ERS, "Rice Sector at a Glance," September 27, 2023; USDA, FAS, PSD Online, "Rice Production, All Countries, 2024," accessed various dates.
[299] USDA, FAS, PSD Online, "Rice Production, All Countries, 2024," accessed various dates.
[300] Government of India, MCI, APEDA, "Basmati Rice," accessed August 28, 2024; Expora, "Difference between Basmati and Non-Basmati Rice," May 19, 2023.
[301] India Gate, "Understanding the Cultural Significance of Basmati Rice," February 2, 2024; Amoli International, "Basmati Rice," accessed December 2, 2024.
[302] Dal is a simmered dish of spiced legumes. Merriam-Webster, "Dal Definition and Meaning," accessed December 19, 2024; *The Times of India*, "Different Varieties of Rice in India," June 10, 2022; India Gate, "Exploring Indian Rice Types," October 19, 2023.
[303] Sparc Exim, "Non-Basmati Rice," accessed December 2, 2024; D. Gorawat International, "IR 64 Non Basmati Rice," December 17, 2024.
[304] India has contributed 18,000 varieties to the International Rice Research Institute's Genebank. IRRI, "India-IRRI," July 2018; India Gate, "Exploring Indian Rice Types," October 19, 2023; *The Times of India*, "Different Varieties of Rice in India," June 10, 2022.
[305] USDA, FAS, *Grain and Feed Annual: India*, March 29, 2024, 14; USDA, FAS, PSD Online, "Rice Production, All Countries, 2024," accessed various dates.
[306] Industry representatives, interviews by USITC staff, Gurugram, India, June 11, 2024; *Rice Trader*, "Panel Discussion at the 2024 Global Rice Summit," June 7–8, 2024; Sparc Exim, "Non-Basmati Rice," accessed December 2, 2024.

Table 5.3 India: rice production, consumption, stocks, and trade, marketing years 2018/19–2023/24
In metric tons (mt), hectares (ha), kilograms (kg), metric tons per hectare (mt/ha), and percentages (%). ** = rounds to zero (less than 500 mt).

Attribute	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
Beginning stocks (1,000 mt)	22,600	29,500	33,900	37,000	34,000	35,000
Production (milled) (1,000 mt)	116,484	118,870	124,368	129,471	135,755	137,000
Area harvested (1,000 ha)	44,156	43,662	45,769	46,279	47,832	47,600
Yield (rough) (mt/ha)	4.0	4.1	4.1	4.2	4.3	4.3
Imports (1,000 mt)	**	**	**	**	**	**
Consumption and residual (1,000 mt)	99,164	101,950	101,052	110,446	114,510	117,750
Exports (1,000 mt)	10,420	12,520	20,216	22,025	20,245	15,250
Ending stocks (1,000 mt)	29,500	33,900	37,000	34,000	35,000	39,000
Exports-to-production ratio (%)	8.9	10.5	16.3	17.0	14.9	11.1
Ending stocks-to-use ratio (%)	26.9	29.6	30.5	25.7	26.0	29.3
Per capita consumption (kg)	75.9	74.5	73.1	79.1	81.4	83.1

Source: USDA, FAS, PSD Online database, accessed September 13, 2024; World Bank, Data: Population, accessed September 13, 2024.
Note: Per capita consumption was calculated using marketing year apparent consumption divided by calendar year population. All other data, including imports and exports, are based on the marketing year.

India's increase in rice production during 2018–23 was a result of both the expansion of area harvested and an increase in yields. Between MY 2018/19 and MY 2023/24, India reported an additional 3.4 million hectares of rice harvested.[307] Part of the increase in area harvested was because of decreased planting of other grains and pulses. This shift to rice from other crops was in response to the expansion of the government's minimum support price (MSP) for rice procurement into states that were not previously major rice-producing states.[308] Average yield increased over the period, but remained low when compared to other global competitors.[309] Yield rates differ across regions of India and can vary from year to year based on the monsoon rains, but the average increase was largely the result of the use of improved varieties and expanded use of irrigation.[310]

Consumption and Stocks

India is a large consumer of rice for food, animal feed, and industrial uses. In MY 2023/24, India was the second-largest consumer of rice in the world after China.[311] India's consumption of rice increased by about 19 percent, from 99.2 million mt in MY 2018/19 to 117.8 million mt in MY 2023/24 (table 5.3). Estimated per capita consumption increased by about 9 percent during the period, despite a dip in the

[307] USDA, FAS, PSD Online database, "Rice Production, All Countries, 2024," accessed various dates. See also, figure 2.3 "Rice yields, selected countries, average, marketing years 2018/19–2023/24" in Chapter 2 "Global Market Overview."
[308] Industry representative, interview by USITC staff, June 3, 2024; USDA, FAS, *Grain and Feed Annual: India*, March 29, 2024, 14–15; USDA, FAS, *Grain and Feed Annual: India*, April 3, 2023, 15.
[309] Vietnam's average yield in MY 2023/24 was 6.1 mt per hectare, China's average yield was 7.1 mt per hectare, and Brazil's average yield was 6.9 mt per hectare. USDA, FAS, PSD Online database, "Rice Production, All Countries, 2024," accessed various dates. See also, figure 2.3 "Rice yields, selected countries, average, marketing years 2018/19–2023/24" in chapter 2, "Global Market Overview."
[310] USDA, FAS, *Grain and Feed Annual: India*, March 29, 2024, 14–15; USDA, FAS, *Grain and Feed Annual: India*, April 3, 2023, 15; Government of India, MAFW, ESD, "Agricultural Statistics at a Glance 2022," 2022, 27.
[311] USDA, ERS, "Rice Sector at a Glance," September 27, 2023; USDA, FAS, PSD Online database, "Rice, Domestic Consumption, All Countries, 2024," accessed various dates.

generally upward trend in MY 2019/20 and MY 2020/21.[312] However, sources reported that Indian rice consumption for food use was relatively stagnant, and may decline as economic growth continues and the expanding Indian middle class consumes foods with higher nutrient levels (e.g., dairy, meat, fruits, and vegetables).[313] Non-basmati varieties are consumed more frequently than basmati in Indian households.[314] Broken rice is consumed by the growing Indian poultry industry as feed and is also used for production of potable liquor and ethanol.[315]

India's rice stocks are mostly made up of government stocks (public stockholding is described below in the section on "Government Programs").[316] In MY 2023/24 government stocks accounted for roughly 92.3 percent of total Indian rice stocks.[317] India doubled its food-grain allocations to support low-income households during the COVID-19 pandemic, which contributed to lower ending stocks in MY 2021/22.[318] These additional allocations reportedly supported between 58–67 percent of the population with rice supplied from government stocks during the pandemic period.[319] India's government ending stocks-to-use ratios dipped in MY 2021/22 and MY 2022/23, consistent with continued pandemic-related food allocations that drew down stocks.[320] At the end of 2022, additional food security allocations ended, which had the effect of increasing end stock levels from MY 2022/23 to 2023/24.[321]

Trade

Formerly a net importer, India first achieved self-sufficiency for rice production in the late 1970s, after which its imports have been small relative to production and exports.[322] Now, India is by far the world's largest exporter of rice by both volume and value, serving many diverse export destinations.[323] In 2023,

[312] USDA, FAS, PSD Online database, "Rice Production, All Countries, 2024," accessed various dates.
[313] Alae-Carew et al., "Future Diets in India," December 2019, 186; USDA, FAS, *Grain and Feed Annual: India*, March 29, 2024, 16.
[314] Veer Overseas, "Which One Is Better?," accessed December 20, 2024.
[315] Industry expert, interview by USITC staff, New Delhi, India, June 3, 2024; Government of India, PIB, "Fact Sheet on Amendment in India's Export Policy on Rice," September 22, 2022; Moffitt, "India Halts Ethanol Production from Excess Rice," July 27, 2023; USDA, FAS, *Grain and Feed Annual: India*, March 29, 2024, 16–17.
[316] PSD Online database reports government stocks as private stocks are not reported publicly for India. USDA, FAS, *Grain and Feed Annual: India*, March 31, 2020, 26.
[317] USDA, FAS, *Grain and Feed Annual: India*, March 29, 2024, 20.
[318] Industry experts and representatives, interviews by USITC staff, New Delhi, India, June 3, 2024; industry expert, interview by USITC staff, New Delhi, India, June 10, 2024; Montescarlos, "Why Is India Rolling Back COVID-19 Food Aid?," February 20, 2023.
[319] Industry expert, interview by USITC staff, June 10, 2024; USDA, ERS, "India, a Major Rice and Wheat Producer," accessed September 24, 2024; USDA, FAS, *Grain and Feed Annual: India*, March 31, 2020, 19–22.
[320] USDA, FAS, PSD Online database, "Rice Production, All Countries, 2024," accessed various dates.
[321] Industry expert, interview by USITC staff, New Delhi, India, June 10, 2024; USDA, FAS, *Grain and Feed Annual: India*, March 29, 2024, 20–21.
[322] In 2023, India imported only 6,000 mt, valued at $5.3 million, mainly from Thailand, Sri Lanka, Italy, and Spain. Industry experts and representatives, interviews by USITC staff, New Delhi, India, June 3, 2024; Glauber and Mamun, "India's New Ban on Rice Exports," July 25, 2023; S&P Global, General imports, HS heading 1006, rice, accessed various dates.
[323] In 2011, India removed export restrictions on non-basmati white rice that were last put in place April 1, 2008, during the 2007–08 period of high food prices. Afterwards, rice exports from India rose quickly from 2011 to 2012, but then held relatively steady from 2013 to 2018 in comparison to the following years, 2019 to 2022. USDA, ERS,

India exported 17.9 million mt of rice, worth $10.5 billion, to 171 markets. This was larger by volume and value than the next three top global exporters combined (Vietnam, Thailand and Pakistan).[324] India exported large volumes of parboiled rice (refers to parboiled long grain white rice, parboiled basmati is classified under basmati); long grain white rice; and basmati rice during the period.[325] In some years broken rice exports to Asia were substantial. In 2022, for example, broken rice exports to China and Vietnam accounted for almost 10 percent of total rice exports from India.[326]

During 2018–23, Indian rice exports first declined, then rose quickly, and later fell in 2023 (table 5.4).[327] The period's rapid increase in exports was due to large increases in domestic production that corresponded with increased overseas demand; Indian government export restrictions for various rice types (discussed below in "Government Programs") contributed to the drop in 2023.[328] Between 2018 and 2019, Indian exports declined because of export competition from China, especially in African markets.[329] Then from 2019 to 2022, exports from India more than doubled from 9.9 million mt to 22.2 million mt.[330] Since 2020, India's increased production and depreciating currency resulted in highly competitive export prices for its rice, especially relative to Pakistani, Thai, and Vietnamese rice.[331] The increased exports were mainly of parboiled rice, long grain white rice, and broken rice; basmati and other rice exports remained relatively steady by comparison.[332] During 2020 to 2022, demand for Indian

"Rice Sector at a Glance," September 27, 2023; Ramesh Sharma, "Food Export Restrictions: Review of the 2007–2010 Experience," May 2011, 29; USDA, FAS, *Grain and Feed Annual: India*, March 29, 2019, 25; S&P Global, Total exports, HS heading 1006, rice, accessed various dates.

[324] S&P Global, Total exports, HS heading 1006, rice, accessed various dates.

[325] S&P Global, Total exports, India subheading, 1006.30.20, basmati, accessed various dates; S&P Global, Total exports, India subheading 1006.30.10, parboiled white rice, accessed various dates; S&P Global, Total exports, India subheading 1006.30.90, non-basmati white rice, accessed various dates; S&P Global, Total exports, HS subheading 1006.10, rice in the husk, paddy or rough, accessed various dates; S&P Global, Total Exports, HS subheading 1006.20, brown rice, accessed various dates; S&P Global, Total exports, HS subheading 1006.40, broken rice, accessed various dates.

[326] S&P Global, Total exports, HS subheading 1006.40, broken rice, accessed various dates; S&P Global, Total exports, HS heading 1006, rice, accessed various dates.

[327] According to annual data, India's total rice exports decreased 20 percent by quantity from 2022 to 2023, but marketing year data reveal a larger 25 percent decrease comparing MY 2022/23 to MY 2023/24 (table 5.3). Monthly trade data from July 2023 to December 2023 (figure 5.2), show that the decline in total rice exports from India picked up at the end of 2023 then continued into 2024. However, rice exports increased sharply in October 2024, after the removal of export restrictions on most rice products (see "Government Programs"). S&P Global, Total exports, HS heading 1006, rice, accessed various dates.

[328] S&P Global, Total exports, HS heading 1006, rice, accessed various dates; USDA, FAS, *Grain and Feed Annual: India*, April 12, 2022, 5–6; USDA, FAS, *Grain and Feed Annual: India*, March 29, 2024, 19–20.

[329] USDA, FAS, *Grain and Feed Annual: India*, March 31, 2020, 24; Dimsums, "China Exports Rice Glut to Africa," May 11, 2019; Navhind Times (desk), "Rice Exports from India Expected to Decline in 2019, Says Report," September 8, 2019; S&P Global, Total exports, HS heading 1006, rice, accessed various dates; S&P Global, General imports, HS heading 1006, rice, accessed various dates; Glauber and Mamun, "India's Export Restrictions on Rice Continue to Disrupt," February 7, 2024.

[330] USITC calculations from S&P Global, Total exports, HS heading 1006, rice, accessed various dates.

[331] India's rupee also weakened against the dollar making its rice export prices more competitive. SDA, FAS, *Grain and Feed Annual: India*, April 12, 2022, 5–6; USDA, FAS, *Rice Export Prices Highest in More Than a Decade as India Restricts Trade*, September 19, 2023; IGC, "All Rice Prices," accessed various dates.

[332] S&P Global, Total exports, India subheading, 1006.30.20, basmati, accessed various dates; S&P Global, Total exports, India subheading 1006.30.10, parboiled white rice, accessed various dates; S&P Global, Total exports,

parboiled rice, long grain white rice, and broken rice in West African and Asian markets was strong.[333] In addition, China and Vietnam fueled India's exports starting in 2021 and into 2022.[334] The demand for broken rice in these markets was due to the expansion of industrial uses of rice (e.g., in manufactured foods like noodles) and the substitution of rice for other more expensive feed grains like corn.[335]

Table 5.4 India: exports of rice, by selected market, 2018–23

In thousands of metric tons. ** = rounds to zero; — (em dash) = not applicable.

Trade partner	2023 rank	2018	2019	2020	2021	2022	2023
Benin	1	602	675	988	1,274	1,630	1,520
Saudi Arabia	2	1,004	1,082	1,285	909	1,013	1,235
Senegal	3	825	194	732	1,181	1,355	937
Togo	4	202	310	743	676	886	863
Guinea	5	462	340	542	727	800	841
Kenya	6	39	10	99	214	400	754
Iran	7	1,139	1,387	1,102	871	1,245	749
Iraq	8	420	512	816	748	376	694
Vietnam	9	1	**	47	814	605	673
Côte d'Ivoire	10	431	317	590	910	1,199	665
Nepal	11	770	690	1,107	1,482	945	565
United Arab Emirates	12	622	470	557	481	541	559
Somalia	13	317	354	422	407	507	414
Bangladesh	26	1,068	63	17	2,513	657	215
China	30	1	2	34	1,208	2,118	183
Sri Lanka	66	155	7	5	207	657	14
All others	—	3,948	3,477	5,630	6,854	7,311	6,979
Total	—	12,006	9,892	14,716	21,477	22,247	17,860

Source: S&P Global, Total exports, HS heading 1006, rice, accessed August 2, 2024.

Notes: Selected markets were top ten export destinations in one or more of the years included. S&P Global reports exports by the calendar year, which differs from the USDA Production, Supply and Distribution Online (PSD) database, which reports based on the marketing year.

India's top export destinations vary by year (table 5.4), driven by demand factors in destination countries. In 2023, India's largest single-country destination was Benin, reflecting the West African region's importance as a global rice export market, in particular for parboiled rice.[336] Between 2020 and 2023, sub-Saharan Africa (and West Africa in particular) faced production and import supply shortages for cereals, exacerbated by sub-Saharan African regional conflicts.[337] Among West Africa's import

subheading 1006.30.90, non-basmati white rice, accessed various dates; S&P Global, Total exports, HS subheading 1006.10, rice in the husk (paddy or rough), accessed various dates; S&P Global, Total exports, HS subheading 1006.20, brown rice, accessed various dates; S&P Global, Total exports, HS subheading 1006.40, broken rice, accessed various dates.

[333] Storey, "Chinese Rice Imports Soar as Exports Hold Steady on Year," October 21, 2021; Torq Commodities, "Why Vietnam Is Importing 100% Broken Rice from India," July 29, 2022.

[334] S&P Global, Total exports, HS heading 1006, rice, accessed various dates.

[335] Torq Commodities, "Why Vietnam Is Importing 100% Broken Rice from India," July 29, 2022; USDA, FAS, *Grain and Feed Annual: China*, April 16, 2021, 10; USDA, FAS, *Grain and Feed Update: India*, November 1, 2022, 6.

[336] The 15 countries in West Africa include Benin, Burkina Faso, Cabo Verde, Côte d'Ivoire, The Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, and Togo. S&P Global, Total exports, India subheading 1006.30.10, parboiled white rice, accessed various dates; S&P Global, Total exports, HS heading 1006, rice, accessed various dates.

[337] Oxfam International, "West Africa Faces Its Worst Food Crisis in Ten Years," April 4, 2022; The Africa Center for Strategic Studies, "Conflict Remains the Dominant Driver of Africa's Food Crisis," October 16, 2023.

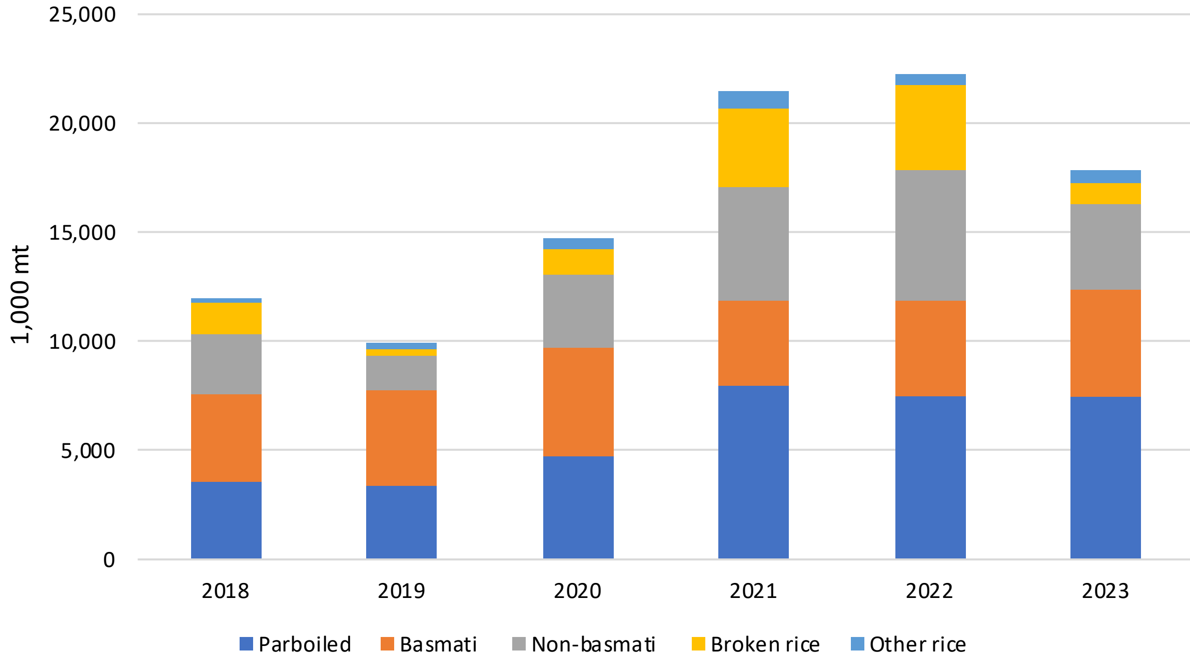
suppliers, India was the main source, accounting for three-quarters of its total imports of rice by quantity in 2023, up from 39 percent in 2018.[338] Although Bangladesh and China were not India's top export destinations in most years, both countries drove large changes in India's exports during the period.[339] In 2021, Bangladesh was the largest single country market for India's parboiled and long grain white rice, the result of lower production in Bangladesh that year.[340] In both 2021 and 2022, China was India's largest market for broken rice, which contributed to the continued increase in India's overall exports.[341] By 2022, China was India's top export destination overall, accounting for 9.5 percent of India's total exports.[342] Vietnam was another notable export destination during this period; for the first time in decades, it resumed substantial imports of broken and long grain white rice from India.[343]

India is the world's largest exporter of high-valued basmati rice. The global market for basmati rice has different destinations and more stable export trends than other types of rice from India. Despite basmati's small share of the country's rice production, it is an important export.[344] It accounted for 19 to 44 percent of the country's rice exports by volume during the period (figure 5.1). By value, basmati export shares ranged from 25–47 percent of total rice exports.[345] In 2023, Saudi Arabia, Iran, and Iraq were the largest basmati destination markets for India by volume.[346] That year, India exported 2.4 million mt of basmati to those three markets, worth about $2.6 billion, accounting for about 13 percent of total rice exports from India.[347] The United Arab Emirates, Yemen, the United States, the United Kingdom, and the European Union are also large markets for basmati rice from India.[348] In 2023, the United States was the sixth-largest single-country market for Indian basmati rice.[349] From 2018 to 2023, exports of basmati from India to the United States grew about 66.4 percent by volume and 72.7 percent by value, from 134,000 mt (worth $165 million) in 2018 to 223,000 mt (worth $285 million) in 2023.[350]

[338] S&P Global, General Imports, HS heading 1006, rice, accessed various dates.
[339] S&P Global, Total exports, HS heading 1006, rice, accessed various dates.
[340] S&P Global, Total exports, India subheading 1006.30.90, non-basmati white rice, accessed various dates; S&P Global, Total exports, India subheading 1006.30.10, parboiled white rice, accessed various dates.
[341] S&P Global, Total exports, HS subheading 1006.40, broken rice, accessed various dates.
[342] S&P Global, GTAS database, Total exports, HS heading 1006, rice, accessed various dates.
[343] Torq Commodities, "Why Vietnam Is Importing 100% Broken Rice from India," July 29, 2022; S&P Global, General imports, HS heading 1006, rice, accessed various dates.
[344] Duggal and Ali, "How Reliant Is the World on Indian Rice Exports?," September 20, 2023; Mahajan et al., "Basmati Rice in the Indian Subcontinent," January 1, 2018, 161–162.
[345] S&P Global, GTAS database, Exports, India subheading, 1006.30.20, basmati, accessed various dates; S&P Global, GTAS database, Exports, HS heading 1006, rice, accessed various dates.
[346] S&P Global, Total exports, India subheading 1006.30.20, basmati, accessed various dates.
[347] S&P Global, Total exports, India subheading 1006.30.20, basmati, accessed various dates.
[348] S&P Global, Total exports, India subheading 1006.30.20, basmati, accessed various dates.
[349] S&P Global, Total exports, India subheading 1006.30.20, basmati, accessed various dates.
[350] S&P Global, Total exports, India subheading 1006.30.20, basmati, accessed various dates.

Figure 5.1 India: total exports of rice, by type and form, 2018–23

In thousands of metric tons (1,000 mt). Underlying data for this figure can be found in appendix F, table F.14.



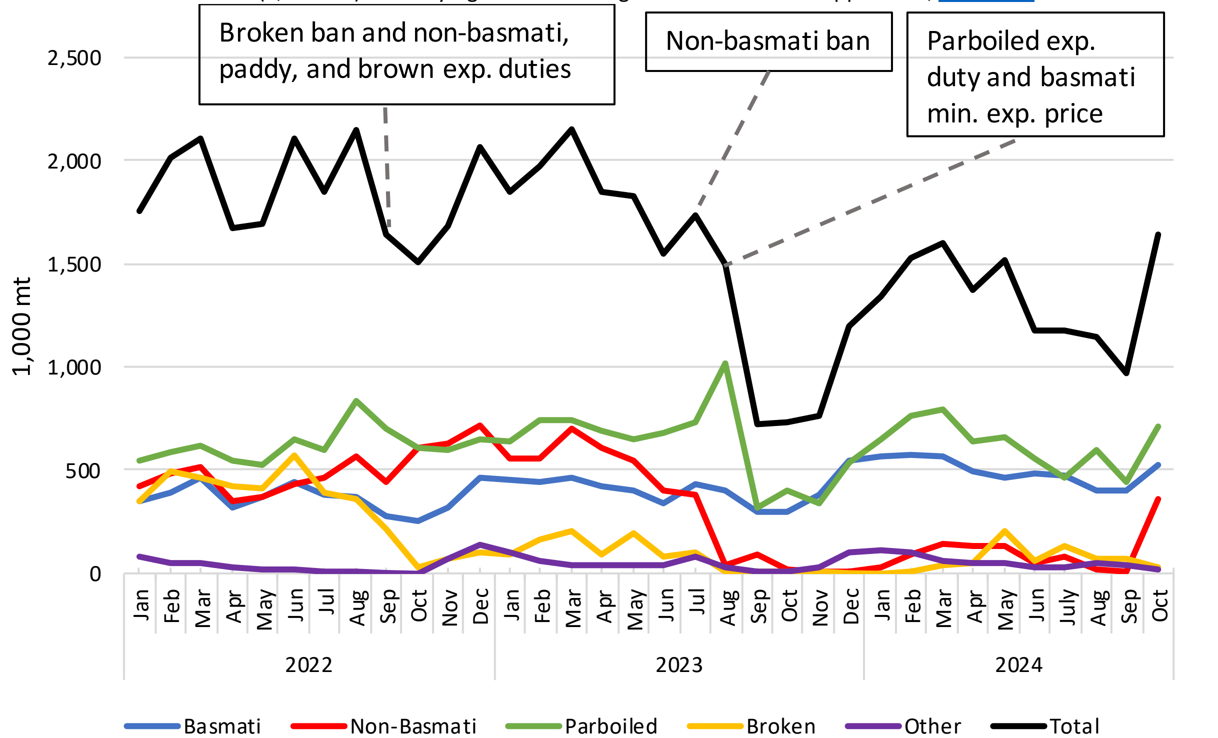
Source: S&P Global, Total exports, Indian subheadings 1006.30.20, basmati; 1006.30.10, parboiled white rice; 1006.30.90, non-basmati white rice; and HS subheadings 1006.10 (paddy or rough rice); 1006.20, brown rice; 1006.40, broken rice, accessed August 11, 2024.

From January 2022 to September 2024, exports of non-basmati and broken rice declined, parboiled rice exports fluctuated widely, and basmati rice exports decreased. On an annual basis, from 2022 to 2023, total exports of rice from India dropped by about 20 percent by quantity and 3 percent by value.[351] The government's imposition of export duties and bans on exports of certain rice types and forms triggered this decline, but impacts differed by rice type. These different trends were due to differences in supply and demand factors (as noted below). Monthly data show that export declines for banned products continued into 2024 (figure 5.2). However, in October 2024, non-basmati, basmati, and parboiled rice exports increased rapidly; although, this is only one month of data, it corresponds to India's removal of export restrictions for these products.

[351] S&P Global, Total exports, HS heading 1006, rice, accessed various dates; USDA, FAS, PSD Online database, "Rice Production, All Countries, 2024," accessed various dates.

Figure 5.2 India: exports of rice, by type and form, and noted export restrictions January 2022–October 2024

In thousands of metric tons (1,000 mt). Underlying data for this figure can be found in appendix F, table F.15.



Note: Other rice includes paddy or rough rice and brown rice. During the period, India enacted a series of trade policies for various rice products. By October 22, 2024, these trade restrictions were removed by the government, except for the ban on broken rice, which was still in place (for further details refer to "Government Programs).
Source: S&P Global, Total exports, India subheadings 1006.30.20, basmati; 1006.30.10, parboiled white rice; 1006.30.90, non-basmati white rice; and HS subheadings 1006.10, paddy or rough rice; 1006.20, brown rice; 1006.40, broken rice, accessed October 29, 2024.

Non-basmati rice made up between 15 and 27 percent of India's rice exports during the period.[352] Exports of non-basmati rice were particularly high in 2021 and 2022 (figure 5.1), resulting from large increases in exports to several destinations, including Bangladesh, Vietnam, and sub-Saharan African markets, including Benin.[353] In 2021, to control domestic prices after a weak harvest, Bangladesh's government temporarily relaxed its normally high import tariff. This change made it feasible to import rice from India, Bangladesh's preferred supplier based on price and freight costs.[354] In September 2022, India's export duties of 20 percent on non-basmati rice did not lead to a decline in exports of these

[352] S&P Global, Total exports, India subheadings 1006.30.20, basmati; 1006.30.10, parboiled white rice; 1006.30.90, non-basmati white rice; and HS subheadings 1006.10, paddy or rough rice; 1006.20, brown rice; 1006.40, broken rice, accessed October 29, 2024.
[353] S&P Global, Total exports, India subheadings 1006.30.10, parboiled white rice; 1006.30.90, non-basmati white rice; and HS subheadings 1006.10, paddy/rough rice; 1006.20, brown rice; 1006.40, broken rice, accessed October 29, 2024.
[354] USDA, FAS, *Grain and Feed Annual: Bangladesh*, April 5, 2022, 6; USDA, ERS, "Rice Sector at a Glance," September 27, 2023.

products, but the subsequent July 2023 export ban did precipitate a sharp decline (figure 5.2).[355] However, exports of non-basmati rice did not fall to zero because the Indian government allowed shipments of non-basmati rice to South Asian and African countries on request of those governments for food security needs.[356] After the restrictions were removed, exports increased by over 2,000 percent from September 2024 to October 2024.

Broken rice generally accounted for a smaller share of India's rice exports by volume (between 3 and 18 percent over the period) and by value, compared to other rice types.[357] Senegal was consistently one of the main destinations for this product during the period because Senegalese consumers preferred imported broken rice over their more expensive local rice.[358] In 2021 and 2022, India's exports of broken rice to China and Vietnam increased substantially. This was driven by low prices for Indian rice relative to other grains, which made it more attractive for food manufacturing and animal feed.[359] The September 2022 ban on broken rice exports led to a sharp decline (figure 5.2), but exports of broken rice did not fall to zero because the government allowed certain shipments to continue.[360] The export ban on broken rice was ongoing as of October 2024, thus, export declines continued. Later, in December 2024, the government of India allowed export quota allocation as with non-basmati white rice.[361]

Exports of parboiled rice increased overall from 2018 to 2023 (figure 5.1), then fluctuated afterwards. The increase from 2018 to 2023, was largely driven by increased exports to Bangladesh and sub-Saharan Africa (West African countries in particular).[362] In 2021, exports of parboiled rice to Bangladesh reached a peak, accounting for more than one-quarter of India's exports of parboiled rice in that year. Vietnam and Cuba were also relatively new destinations for parboiled rice in 2023.[363] Although the Indian government's export duty on parboiled rice led to a short-term drop in exports, export levels recovered in the first part of 2024 because India's parboiled rice remained competitively priced, especially compared with parboiled rice from Thailand.[364] Then fluctuations continued, and exports of parboiled rice declined in the middle part of 2024, but increased 60 percent from September 2024 to October

[355] Government of India, Centre Amends Export Policy of Non-Basmati White Rice, July 20, 2023; USDA, FAS, *Grain and Feed Annual: India*, March 29, 2024, 20; S&P Global, GTAS database, Exports, India subheading 1006.30.90, non-basmati white rice, accessed various dates.
[356] Government of India, DGFT, "Amendment in Export Policy of Non-Basmati Rice," July 20, 2023; USDA, FAS, *Grain and Feed Annual: India*, March 29, 2024, 20–21; S&P Global, Total exports, India subheading 1006.30.90, non-basmati white rice, accessed various dates.
[357] S&P Global, Total exports, India subheadings 1006.30.10, parboiled white rice, 1006.30.90, non-basmati white rice, accessed October 29, 2024; S&P Global, Total exports, HS subheading 1006.10, rice in the husk (paddy or rough), accessed October 29, 2024; S&P Global, Total exports, HS subheading 1006.20, husked (brown) rice, accessed October 29, 2024; S&P Global, Total exports, HS subheading 1006.40, broken rice, accessed October 29, 2024.
[358] USDA, FAS, *Grain and Feed Annual: Senegal*, April 26, 2022, 3.
[359] Torq Commodities, "Why Vietnam Is Importing 100% Broken Rice from India," July 29, 2022; USDA, FAS, *Grain and Feed Update: India*, November 1, 2022, 6.
[360] USDA, FAS, *Grain and Feed Annual: India*, March 29, 2024, 20–21; Government of India, PIB, "Fact Sheet on Amendment in India's Export Policy on Rice," September 22, 2022; Government of India, DGFT, "Amendment in Export Policy of Broken Rice," September 8, 2022.
[361] Government of India, DGFT, "Export of Broken Rice to Senegal and Gambia," December 5, 2024.
[362] S&P Global, Total exports, India subheading 1006.30.10, parboiled white rice, accessed various dates.
[363] S&P Global, Total exports, HS heading 1006, rice, accessed various dates.
[364] Anand and Kathait, "New Indian Government Unlikely to Lift Export Duty on Parboiled Rice," May 29, 2024.

2024 (figure 5.2). The government of India lowered the parboiled rice export duty from 20 percent to 10 percent in September 2024 and removed it in late October 2024.

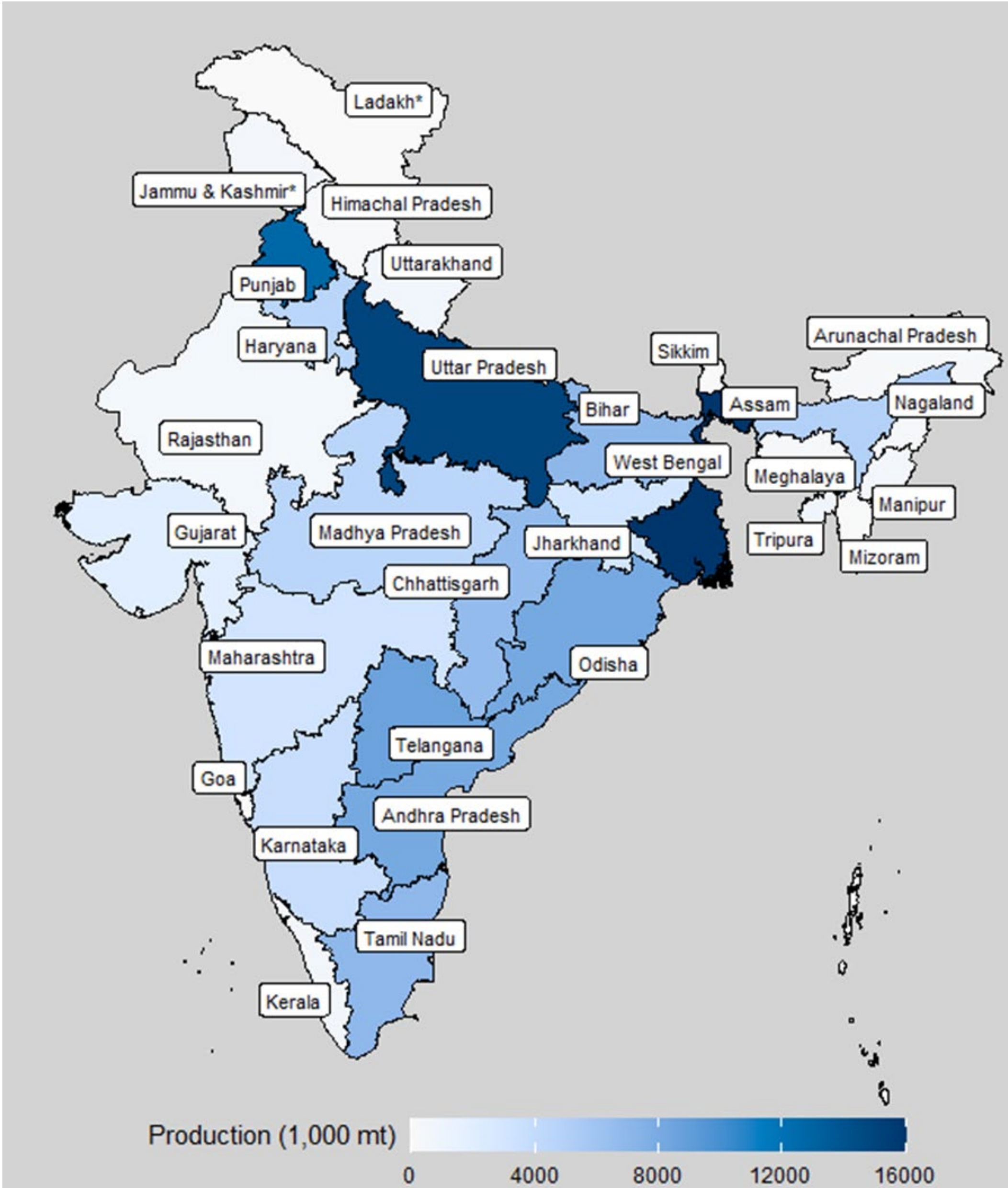
Industry Structure

Rice production across India varies widely based on water sources (irrigation versus rainfed), varieties, and government policies. Although the nature of rice production varies across India, it generally occurs on smallholder farms within a predominant planting season and a reliance on monsoon rains. Broadly, rice produced in the northwest and north central states is both basmati and nonaromatic rice grown on land that is irrigated. Rice produced in the central and eastern states is nonaromatic rice and is typically rain fed and heavily dependent on the annual monsoons.[365] The largest producing states, on average, from MY 2017/18 to MY 2021/22 (the latest years available) were West Bengal, Uttar Pradesh, and Punjab (figure 5.3). Telangana is also a major producer of rice.[366] Basmati rice is grown in the states of Punjab, Haryana, Delhi, Himachal Pradesh, and Uttarakhand, as well as in specific districts of western Uttar Pradesh and in Jammu and Kashmir.[367] The two main growing seasons are *Kharif*, or fall harvested, with planting beginning as early as May in some regions and harvesting beginning in early November, and *Rabi,* or winter planted, with planting beginning as early as November and harvesting beginning in late April.[368] The *Kharif* season accounts for about two-thirds of all rice production and is heavily dependent on the monsoon rains, which typically begin in June.[369] Although some farmers can produce two rice crops per year, many farmers in the northwest and north central states grow other crops such as wheat, corn, or potatoes during the *Rabi* season.[370]

[365] Industry representative, interview by USITC staff, Gurugram, India, June 11, 2024; *Rice Trader*, "Panel Discussion at the 2024 Global Rice Summit," June 7–8, 2024.
[366] USDA, FAS, IPAD, "India Rice Area, Yield and Production," accessed October 1, 2024.
[367] EC, "Basmati India," September 11, 2020.
[368] USDA, FAS, IPAD, "India Rice Area, Yield and Production," accessed October 1, 2024; USDA, FAS, *India Rice: Production Down*, December 22, 2022, 1; USDA, FAS, *Grain and Feed Annual: India*, March 29, 2024, 6.
[369] USDA, FAS, *India Rice: Production Down*, December 22, 2022, 1; Aggarwal, "Kharif Season in India – Changing Dynamics and Emerging Perspectives," July 1, 2024.
[370] USDA, FAS, *Grain and Feed Annual: India*, March 29, 2024, 5; USDA, FAS, *Grain and Feed Annual: India*, April 3, 2023, 6-7; industry representative, interview by USITC staff, Ambala, India, June 13, 2024; industry representative, interview by USITC staff, Karnal, India, June 13, 2024; industry representative, interview by USITC staff, Karnal, India, June 12, 2024; *Rice Trader*, "Panel Discussion at the 2024 Global Rice Summit," June 7–8, 2024.

Figure 5.3 India: rice production by state, five-year average, marketing years 2017/18–2021/22

In thousands of metric tons (1,000 mt). Underlying data for this figure can be found in appendix F, table F.16.



Source: Government of India, Ministry of Agriculture and Farmers Welfare, Economics and Statistics Division, May 2023.
Note: *Ladakh and Jammu & Kashmir are Union Districts.

Rice farming in India is characterized by small, family landholdings and limited economies of scale. These characteristics limited farmers' ability to access the funding needed to increase mechanization during 2018–23.[371] In MY 2019/20, the latest year of available data, about one-quarter of India's cropped land

[371] Industry representative, interview by USITC staff, Ambala, India, June 13, 2024; industry expert, interview by USITC staff, June 3, 2024.

was used for rice cultivation.[372] An estimated 90 percent of these rice farms were smaller than 2 hectares.[373] Farm size has consistently decreased as land is divided when farms are passed down from one generation to the next.[374] Additionally, all states cap the allowable size of individual land holdings to varying degrees.[375] Reportedly, consolidation restrictions prevent businesses, especially those already heavily involved in private grain retail, from vertically integrating into crop production.[376] Despite this, land consolidation efforts reportedly occur, particularly where one member of a family manages multiple holdings on behalf of the rest of the family.[377]

State land laws in India disincentivize formal rental agreements, and, in turn, discourage land improvements. Although data specific to rice production are unavailable, approximately 17.3 percent of all agricultural lands are tenant farms.[378] This percentage is likely underestimated because many tenancies are informal.[379] Farmers producing under informal agreements lack incentives to make land improvements or capital investments. Rental agreements are often informal because some Indian state land laws allow tenants with contracts to assume ownership of land after several years due to legal stipulations such as adverse possession. This discourages landowners from providing formal long-term leases.[380] Because landowners often do not work a particular plot of land and tenants are not guaranteed long-term access to the land, many landholdings do not receive investment in important land improvements like soil conditioning.[381]

Most of India's rice production is irrigated. As of MY 2019/20, the latest year for which data are available, about two-thirds of rice-producing land was under irrigation.[382] Irrigation is correlated with higher rice production, and three of the four largest producing states—Punjab, Telangana, and Uttar Pradesh—have more than 90 percent of rice-producing land under irrigation. Punjab also has the highest yields of all rice-producing states, averaging 4.34 mt per hectare in MY 2021/22.[383]

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[372] Government of India, MAFW, ESD, "Agricultural Statistics at a Glance 2022," 2022, 186.
[373] USDA, FAS, *Grain and Feed Annual: India*, March 29, 2024, 16.
[374] Industry expert, interview by USITC staff, June 3, 2024; Padhee and Joshi, "Why India Needs a Land Leasing Framework," April 4, 2019.
[375] These ceilings vary state by state and are based on number of crops being grown and whether the land is under irrigation. All states bar nonresident Indians and nonresident persons of Indian origin from purchasing agricultural land. Industry expert, interview by USITC staff, June 3, 2024; Sunder, "Land Rules," October 6, 2023; Government of India, MAFW, ESD, "Agricultural Statistics at a Glance 2022," 2022, 195; Deepika, "11 Major Problems Faced By Indian Farmers," March 13, 2023.
[376] Industry expert, interview by USITC staff, June 3, 2024.
[377] Industry expert, interview by USITC staff, June 3, 2024; industry representative, interview by USITC staff, Karnal, India, June 13, 2024; industry representative, interview by USITC staff, Karnal, India, June 12, 2024.
[378] Pandey, "Landless, Tenant Farmers Miss out on Compensation," January 20, 2023.
[379] Pandey, "Landless, Tenant Farmers Miss out on Compensation," January 20, 2023; Prasad et al., "An Inner View into the Problems Faced by Tenant Farmers," September 2012, 2.
[380] Padhee and Joshi, "Why India Needs a Land Leasing Framework," April 4, 2019; Sushant, "The Doctrine of Adverse Possession Explained," December 17, 2024.
[381] Industry expert, interview by USITC staff, June 3, 2024; Pany, "Authenticating True Farmer through Land," July 14, 2020.
[382] Across all agriculture, most (63.6 percent) of irrigated area comes from groundwater irrigation via open wells and tubewells. Canal irrigation is limited, accounting for only 26.2 percent of irrigated area. Government of India, MAFW, ESD, "Agricultural Statistics at a Glance 2022," 2022, 28–29.
[383] Government of India, MAFW, ESD, "Agricultural Statistics at a Glance 2022," 2022, 29, 205.

Several interrelated structural factors create challenges for India's rice producers, including ongoing reliance on labor-intensive production methods and lack of scale. Rice production in India is labor intensive, particularly during weeding, transplanting, and harvesting, and farmers face labor scarcity and rising labor costs.[384] Large-scale modern mechanization in rice farming in India is limited, owing to small plot sizes and lack of access to financing to obtain machinery.[385] Although traditional cooperatives are not prevalent in Indian rice production, farmer producer organizations have developed to help farmers grow a wider variety of crops and to share the costs of farming and processing equipment.[386]

Rice production in India is heavily impacted by weather- and climate-related challenges, including droughts, floods, and excessively high temperatures. For example, the El Niño weather phenomenon disrupts rainfall patterns, causing erratic monsoon episodes. If a monsoon is disrupted enough to cause a drought, reportedly up to 35 percent of rice production can be impacted.[387] Sudden and sustained temperature increases also affect the productivity of rice production. Extreme temperatures can increase pest and disease pressures, increasing costs (such as the cost of pesticides) and reducing yields. In some areas of India, particularly where rice is grown in intensive production systems, overuse of fertilizers and a declining supply of groundwater are reportedly compounding these long-term threats to rice production.[388]

Research is ongoing to develop new rice varieties that will help producers respond to these challenges. In addition to basmati rice research, the government of India collaborates with the International Rice Research Institute (IRRI) to continue to develop new non-basmati rice varieties.[389] These varieties feature shorter duration to maturity (110 to 130 days to harvest vs. 160 to 200 days to harvest), thus needing less water.[390] They also have more heat and drought tolerance, more pest and disease resistance, and higher yields. However, many of these varieties will not be commercially available for several years, and there is concern about the quality of some of these varieties because their kernels are reportedly more prone to breaking during the milling process.[391] Reportedly, the newer varieties also need to be used in direct sowing (DS) and alternate wetting and drying (AWD) production practices and require more

384 Industry representative, interview by USITC staff, Ambala, India, June 13, 2024; industry representative, interview by USITC staff, Karnal, India, June 13, 2024; industry representative, interview by USITC staff, Karnal, India, June 12, 2024; Hazarika, "The Cultural Role of Rice Cultivation in Female Workforce Participation in India," October 2024, 2.
385 Industry representative, interview by USITC staff, Ambala, India, June 13, 2024.
386 Industry representative, interview by USITC staff, Ambala, India, June 13, 2024.
387 Sharma, "How India's Ban on Some Rice Exports Is Ricocheting around the World," August 16, 2023; Government of India, MAFW, ESD, "Agricultural Statistics at a Glance 2022," 2022, 196–98; USDA, FAS, *Grain and Feed Annual: India*, March 29, 2024, 13; USDA, FAS, *Monsoon Withdrawal Delayed*, October 2, 2024, 2.
388 Gupta, "Back to the Future for India's Rice Farmers," August 14, 2023; USDA, FAS, *Grain and Feed Annual: India*, March 29, 2024, 15.
389 IRRI, "India and IRRI," accessed August 28, 2024.
390 IRRI, "Short-Duration Rice Varieties," accessed November 25, 2024.
391 Industry representative, interview by USITC staff, New Delhi, India, June 3, 2024; USDA, FAS, *Grain and Feed Annual: India*, March 29, 2024, 15–16; *Rice Trader*, "Panel Discussion at the 2024 Global Rice Summit," June 7–8, 2024.

pesticides and fertilizers.[392] The natural pest and weed control are lost when switching from the traditional puddling methods to DS and AWD. However, combined, DS and AWD use up to 50 percent less water than traditional puddling methods.[393]

After harvest, farmers bring paddy rice to a local mandi, a marketplace where several commodity crops are sold. More than 2,400 principal mandis and more than 4,800 submarkets reportedly operate in India.[394] These markets and submarkets are regulated by Agricultural Produce Market Committees (APMCs) with the goal of ensuring fair and transparent auctions. Per the APMC Act, the first market transaction of several agricultural commodities, including rice, can be conducted only at a mandi and is supervised by a commissioned agent licensed by the APMCs. The APMC agent's role is to support the farmer in getting a fair price; in turn, the agent earns a percentage of the sale. Only commissioned agents can participate in the transaction between farmers (sellers) and licensed traders (private buyers, generally from mills) or state or central government buyers.[395]

Millers procure and aggregate rice from mandis before processing, packaging, and distributing to consumers. The rice milling industry is extensive and fragmented, with thousands of small and medium-scale milling operations, alongside a smaller number of larger facilities.[396] Many smaller and older facilities struggle with outdated machinery, but recent technological advances are improving the quality of rice processing.[397] As of 2020, over 50 percent of rice was processed by modern milling facilities, 40 percent by traditional milling facilities, and 10 percent by hand.[398] Larger millers service both the domestic and export markets.[399]

Millers in India are often not able to enter contracts with farmers, which makes it more difficult to ensure a steady supply of rice that meets specifications for export markets. Contract farming—where milling companies work directly with farmers to ensure crops meet certain standards—is not common in India. In some states, including Punjab and Haryana, it is illegal. Under the contract arrangements that do occur, farmers retain the right to sell their rice directly to the "contract" buyer or to sell at the

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392 Direct seeding does not require fields to be flooded because the seeds are sown directly into the fields instead of planting seeds in a nursery, which requires the seedlings to be transplanted into a flooded field. The alternate wetting and drying method allows fields to drain fully before needing to be watered again. Industry representative, interview by USITC staff, New Delhi, India, June 10, 2024; Jalan, "Grow Paddy with Precision," January 25, 2024; Negi et al., "Direct-Seeded Rice," July 1, 2024, 2; Stein, "How India's Rice Production Can Adapt to Climate Change Challenges," March 11, 2021, 422.
393 Stein, "How India's Rice Production Can Adapt to Climate Change Challenges," March 11, 2021, 419.
394 Bijak, "Understanding The Indian Mandi Trading System," December 21, 2022.
395 Bijak, "Understanding The Indian Mandi Trading System," December 21, 2022; Jayanth, "How Farmers View the Existing Mandi System," December 12, 2020; foreign government representatives, interviews by USITC staff, Haryana, India, June 12, 2024.
396 Suri Engineers, "Rice Milling Industry in India," March 1, 2023.
397 Industry representative, interview by USITC staff, Hyderabad, India, June 5, 2024; Raju, "Rice Milling Industry in India," March 1, 2023; Rice Processing Equipment, "Prospects of Rice Mill Modernization in India," August 26, 2020.
398 Rice Processing Equipment, "Prospects of Rice Mill Modernization in India," August 26, 2020.
399 Industry representatives, interviews by USITC staff, New Delhi, India, June 5, 2024; industry representatives, interviews by USITC staff, Haryana, India, June 12, 2024; industry representative, interview by USITC staff, Gurugram, India, June 11, 2024.

prevailing market price to any licensed trader, provided the sale occurs at a mandi.[400] Despite the lack of binding contracts, some millers provide education—for example, pesticide and fertilizer best practices—to farmers to better meet buyers' standards, such as maximum residue limits set by destination markets.[401]

Mills serve as the primary storage sites for paddy rice, particularly basmati rice, which is aged for approximately two years.[402] Rice milling is segregated by variety and grain length because of the specifications required to mill each variety.[403] Although most mills specialize in only one variety (often, the variety produced in the surrounding area), larger firms with multiple milling operations process additional specialty varieties and make products such as rice bran oil and rice-based snack foods.[404]

Improvements in marketing and distribution infrastructure have benefited Indian rice production, and the agricultural sector in general, over the past decade. In the past, inadequate road networks, transportation, and storage facilities hampered the efficient movement of rice from farms to mills and points of consumption.[405] However, in recent years, inland port infrastructure and road networks have greatly improved, removing several days from transportation time.[406] According to the World Bank, India's infrastructure scores have fluctuated but increased from 2.9 out of 5 in 2018 to 3.2 out of 5 in 2023.[407]

Government Programs

India heavily regulates its agricultural sector to ensure food security, food self-sufficiency, and income support for its farmers. Historical experiences and the recent political environment inform government action on these priorities. First, a history of periodic food shortages in the country before and after independence in 1947 and through the 1960s prompted the government to focus on ensuring food security.[408] Second, about 55 percent of the Indian workforce is employed in agriculture and related activities, the majority of which are low income or resource poor and comprise an important voting

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[400] Industry representatives, interviews by USITC staff, New Delhi, India, June 5, 2024; industry experts, interviews by USITC staff, June 3, 2024; foreign government representatives, interviews by USITC staff, Haryana, India, June 12, 2024.
[401] Industry representatives, interviews by USITC staff, New Delhi, India, June 10, 2024; industry representatives, interviews by USITC staff, Haryana, India, June 12, 2024.
[402] Industry representatives, interviews by USITC staff, Haryana, India, June 12, 2024; Discovery Channel and KRBL, "God of Grains," 27:59, February 23, 2019.
[403] Industry representative, interview by USITC staff, Haryana, India, June 12, 2024; industry representative, interview by USITC staff, Hyderabad, India, June 5, 2024.
[404] Industry representative, interview by USITC staff, Gurugram, India, June 11, 2024; Discovery Channel and KRBL, "God of Grains," 35:40, February 23, 2019; KRBL Limited, "Our Portfolio," accessed November 1, 2024; LT Foods, "Brands," accessed November 1, 2024.
[405] Industry representative, interview by USITC staff, Karnal, India, June 12, 2024; Rice Processing Equipment, "Prospects of Rice Mill Modernization in India," August 26, 2020.
[406] Industry representative, interview by USITC staff, Karnal, India, June 12, 2024.
[407] World Bank, "International Scorecard Page: Logistics Performance Index (LPI)," accessed December 5, 2024.
[408] Panda, "Evolution of India's Policy Response to Hunger, Nutrition, and Food Security Since Independence," September 24, 2023, 22.

bloc.[409] Finally, food price fluctuations over the past 20 years prompted the government to attempt to contain domestic food price volatility.[410] The resulting policy interventions, detailed below, are substantial and complex, consisting of significant public stocks and minimum support prices, input subsidies, export restrictions, and high import tariffs.

Public Stockholding and Minimum Support Prices

India has an extensive public stockholding program designed to maintain operational stocks of commodities (particularly rice and wheat) for distribution purposes under targeted welfare schemes, as well as food security stocks (also known as buffer stocks) in the case of future procurement shortfalls, as directed by the National Food Security Act.[411] Historical food shortages and price fluctuations led the Indian government to focus on food security and the creation of the Public Distribution System, and later the Targeted Public Distribution System and the Antodaya Anna Yojana program, to ensure food security for the poorest Indians through the distribution of essential commodities, including rice.[412] The National Food Security Act, enacted in 2013, legally entitles 75 percent of the rural population and 50 percent of the urban population to subsidized foodgrains from the Targeted Public Distribution System.[413]

Government Procurement at Minimum Support Prices

The Food Corporation of India (FCI), through coordination with individual state governments, procures grains, such as wheat, paddy rice, and milled rice, for the public stocks at minimum support prices (MSPs) that are announced well before the commencement of the planting seasons.[414] In MY 2022/23 the MSP for paddy rice was 20,400 Indian rupees (Rs.) ($240.43 at current exchange rates) per mt, up

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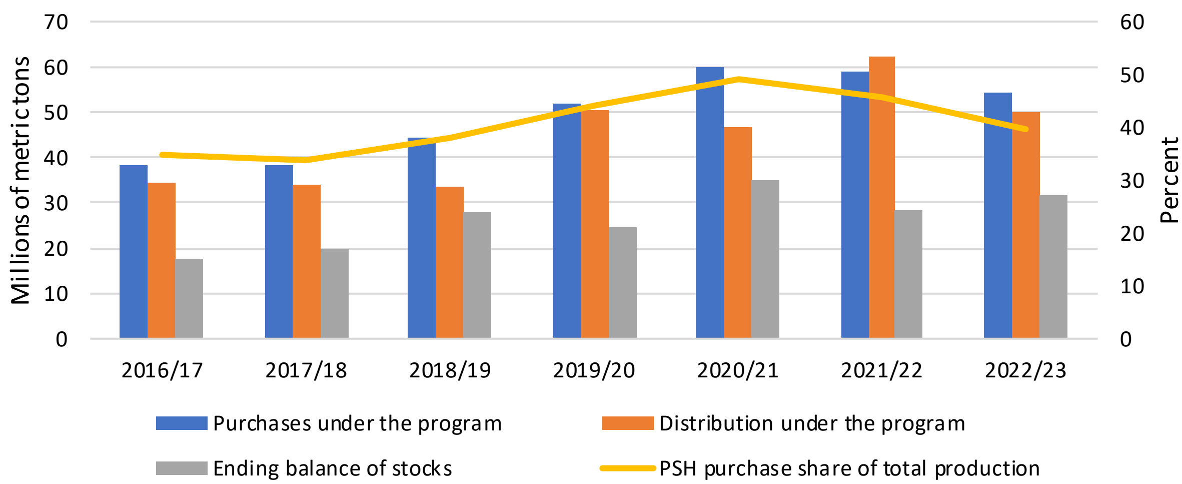
[409] Government of India, PIB, "Union Home Minister and Minister of Cooperation, Shri Amit Shah Inaugurates," July 14, 2023; WTO, Committee on Agriculture, "Notification of Domestic Support: India," April 2, 2024, 5.
[410] Saini and Gulati, "India's Food Security Policies in the Wake of Global Food Price Volatility," 2016, 333.
[411] Almost no rice from public stocks has been exported since the early 2000s. Government of India, DFPD, "Food Corporation Of India," accessed September 27, 2024; OECD, *The Economic Effects of Public Stockholding Policies for Rice in Asia*, October 18, 2018, 25; National Food Security Act of 2013, § 2(2)(ii) (September 10, 2013); Banga and Sekhar, "Public Stockholding of Food in India: Can It Distort International Trade?," October 2015, 4, 5.
[412] The Public Distribution System originally comprised 460,000 fair price shops across the country for the distribution of essential commodities to all consumers. In 1997 the Indian government reformed the Public Distribution System to reduce costs and target low-income beneficiaries, particularly those below the poverty line, becoming the Targeted Public Distribution System. Government of India, DFPD, "Public Distribution System," accessed April 5, 2024; Jha, Srinivasan, and Landes, "Indian Wheat and Rice Sector Policies and the Implications of Reform," May 1, 2007, 10.
[413] Government of India, DFPD, "National Food Security Act," accessed August 2, 2024; National Food Security Act of 2013, § 3(2) (September 10, 2013).
[414] The FCI is within the Department of Food and Public Distribution, which is part of the Ministry of Consumer Affairs, Food, and Public Distribution. The objective of the FCI is to ensure price support for farmers; distribution of foodgrains around the country; and maintenance of operational and buffer stock of foodgrains for food security purposes. Farmers can sell to millers at market price, or sell to the government, through the FCI, for the MSP. Government of India, CACP, *Price Policy for Kharif Crops*, accessed April 5, 2024; OECD, *The Economic Effects of Public Stockholding Policies for Rice in Asia*, October 18, 2018, 24, 25; industry expert, interview by USITC staff, New Delhi, India, June 3, 2024; industry representative, interview by USITC staff, Hyderabad, India, June 5, 2024; Government of India, DFPD, "Food Corporation Of India," accessed September 27, 2024.

from Rs. 19,400 ($230.23) per mt in MY 2021/22.[415] The MSP is calculated by India's Commission for Agricultural Costs and Prices and takes into consideration the cost of production, including seeds, fertilizer, pesticides, and labor; domestic and international price trends; intercrop price parity; and a minimum 50 percent profit over the cost of production.[416] The FCI buys paddy rice directly from farmers, through the mandis, and maintains substantial rice stocks at all times. On average, from MY 2019/20 to MY 2022/23, the FCI procured 44.8 percent of total Indian rice production each marketing year (figure 5.4).[417]

Figure 5.4 Public stock procurement, distribution, ending stocks, and share of procurement to total rice production, marketing years 2016/17–22/23

In millions of metric tons and percent. Underlying data for this figure can be found in appendix F, table F.17.



Source: USITC calculation; WTO, Committee on Agriculture, "Notification of Domestic Support: India," March 31, 2023, 12; WTO, Committee on Agriculture, "Notification of Domestic Support: India," April 2, 2024, 12.

Distribution

Operational stocks are distributed throughout the country, where they are transferred from the central government to the state governments at the Central Issue Price. Rice is then distributed to certain low-income consumers under the Targeted Public Distribution System.[418] In MY 2022/23, this amount was 5 kilograms (kg) per person a month at 3 rupees/kg for rice. The Antodaya Anna Yojana program further targets the poorest of the population, allotting 35 kg per person per month of highly subsidized grain for

[415] Government of India, DFPD, "Minimum Support Price for Wheat and Rice," accessed April 5, 2024. In addition to the MSP offered by the central government, individual states may add an additional MSP bonus to support farmers in that state. In 2021, the central government began adding additional bonuses on top of MSP in East India to encourage production there because it is less water starved. WTO, Committee on Agriculture, "Certain Measures of India Providing Market Price Support to Rice and Wheat," June 4, 2023; industry representative, interview by USITC staff, New Delhi, India, June 3, 2024; Government of India, MAFW, "Bringing Green Revolution to Eastern India," March 23, 2021.
[416] Government of India, CACP, "Determinants of MSP," accessed August 12, 2024; Government of India, MAFW, *Annual Report 2022-23*, accessed February 20, 2024, 6.
[417] USITC calculation; WTO, Committee on Agriculture, "Notification of Domestic Support: India," March 31, 2023, 12; WTO, Committee on Agriculture, "Notification of Domestic Support: India," April 2, 2024, 12.
[418] Government of India, DFPD, "Public Distribution System," accessed April 5, 2024.

3 rupees/kg.[419] Public stocks of foodgrains, including rice, are permitted to be distributed only domestically and cannot be exported.[420] The government of India reports that the total value of the public stockholding program, including allocations for food distribution and buffer stock, reached $28.1 billion in MY 2021/22 and rose to $33.9 billion in MY 2022/23.[421]

Input Subsidies

Input subsidies for farmers are an important part of India's food and agriculture policy regime, and the government's input subsidy expenditure equaled 10 percent of India's total agricultural output in 2023.[422] The largest input subsidies include support for irrigation, fertilizers, and electricity, available to low-income or resource-poor farmers.[423] These subsidies were reported to total $32.1 billion in MY 2021/22 and $48.1 billion in MY 2022/23.[424] The substantial increase in expenditure (about 50 percent) has been attributed to inflation and rising fertilizer costs.[425] Data on the amount spent on individual subsidies or the share of input subsidies going toward rice production are limited, however.

Interest and insurance premium subsidies are also available to farmers, and they totaled $5.5 billion in MY 2021/22 and $4.5 billion in MY 2022/23.[426] These subsidies are not product specific; thus, disaggregated values for rice are not currently available. Additionally, various types of seed (or payments to purchase seed) are provided under the National Food Security Mission Scheme.[427] All input subsidy values include subsidies issued by the central government, as well as individual state-issued subsidies.[428]

Trade Restrictions

The Indian government has imposed export restrictions on rice over two time periods in recent years as a means of containing domestic prices and increasing domestic availability. In 2007 and 2008, amid the period of higher food prices, the government imposed an export ban on non-basmati rice, which was not lifted until September 2011.[429] Because India is one of the largest exporters of rice, its imposition and removal of export restrictions created volatility in the global rice market: estimates suggest that India's

[419] Government of India, DFPD, "Public Distribution System," accessed April 5, 2024.
[420] Certain exceptions may be made for exports for the purpose of humanitarian assistance. Government of India, DFPD, "Import/Export," accessed August 8, 2024.
[421] WTO, Committee on Agriculture, "Notification of Domestic Support: India," March 31, 2023, 4; WTO, Committee on Agriculture, "Notification of Domestic Support: India," April 2, 2024, 3.
[422] USITC calculation; WTO, Committee on Agriculture, "Notification of Domestic Support: India," April 2, 2024, 5; Statista, "Agriculture - India," accessed August 26, 2024.
[423] The government of India states that, per the Agricultural Census, 99.43 percent of all farm holdings are of low-income and resource-poor farmers. WTO, Committee on Agriculture, "Notification of Domestic Support: India," March 31, 2023, 5; WTO, Committee on Agriculture, "Notification of Domestic Support: India," April 2, 2024, 5.
[424] WTO, Committee on Agriculture, "Notification of Domestic Support: India," March 31, 2023, 5; WTO, Committee on Agriculture, "Notification of Domestic Support: India," April 2, 2024, 5.
[425] Suneja, "India's $48 Bn Input Subsidy for Power and Agri Raises Hackles," May 27, 2024.
[426] WTO, Committee on Agriculture, "Notification of Domestic Support: India," March 31, 2023, 8; WTO, Committee on Agriculture, "Notification of Domestic Support: India," April 2, 2024, 8.
[427] Government of India, National Food Security Mission, "National Food Security Mission," accessed April 8, 2024.
[428] WTO, "Agricultural Information Management System," accessed April 5, 2024.
[429] Saini and Gulati, "India's Food Security Policies," 2016.

export restrictions were responsible for a more than 20 percent increase in global rice prices and exacerbated food insecurity in import-reliant countries.[430]

The Indian government instituted a series of export restrictions on rice beginning in September 2022 (table 5.5). On September 9, 2022, the government announced that it was banning the export of broken rice and implementing a 20 percent export levy on unmilled rice, husked brown rice, and non-basmati rice. These measures were in response to increased demand by China and the low availability of rice for use in the domestic poultry and ethanol industries in India.[431] The government enacted a ban on exports of non-basmati rice on July 20, 2023.[432] Additional export restrictions followed in August 2023, including a 20 percent export duty on parboiled rice and a minimum export price (initially, no contracts less than $1,200 per mt) for basmati rice.[433] The Ministry of Commerce and Industry noted that the minimum export price was intended to stop non-basmati products from being exported under the guise of basmati.[434] As with previous periods of restrictions on non-basmati rice exports, the Indian government sought to ensure food security and stabilize domestic prices amid lower public stocks and potential reductions in production related to heavy monsoon rains in June 2023.[435]

Most of these restrictions were later removed or amended. On September 14, 2024, the government removed the minimum export price for basmati.[436] On September 27, 2024, the export duties on parboiled, brown, and husked rice were lowered from 20 percent to 10 percent and ultimately removed on October 22, 2024.[437] On September 28, 2024, the government removed the ban on non-basmati white rice and imposed a minimum export price of $490 per mt, which was removed on October 23, 2024.[438]

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[430] Sharma, "Food Export Restrictions: Review of the 2007–2010 Experience and Considerations for Disciplining Restrictive Measures, May 2011, 18; Headey, "Rethinking the Global Food Crisis," April 1, 2011.
[431] Glauber and Mamun, "Global Rice Markets Face Stresses from El Niño, India Export Restrictions," October 2, 2023; Government of India, Notification 31/2015–2020 § 3(ii), September 8, 2022; Government of India, Ministry of Consumer Affairs, Food & Public Distribution, "Fact Sheet on Amendment in India's Export Policy on Rice," September 22, 2022.
[432] Government of India, 20/2023, § 3(ii) (July 20, 2023).
[433] This was later reduced to $950 per mt in October 2023. Government of India, MCI, "Government Removes Floor Price on Basmati," September 14, 2024; Government of India, 49/2023 § 3(ii) (Customs), August 25, 2023.
[434] Glauber and Mamun, "Global Rice Markets Face Stresses from El Niño, India Export Restrictions," October 2, 2023; ET Online, "India Imposes Curbs on Basmati Rice Exports," August 27, 2023; USDA, FAS, *Grain and Feed Annual: India*, March 29, 2024, 20; 20/2023 § 3(ii) (July 20, 2023).
[435] Valera et al., "Domestic and International Impacts of Rice Export Restrictions," June 2024, 1; Shagun, "Export Bans, Restrictions," April 12, 2024.
[436] Government of India, MCI, "Government Removes Floor Price on Basmati," September 14, 2024.
[437] Jadhav and Bhardwaj, "India Halves Export Duty on Parboiled Rice to Boost Shipments," September 30, 2024; Codingest, "India Exempts Parboiled Rice and Brown Rice from Export Duty to Boost Shipments," October 23, 2024.
[438] Government of India, 31/2024–25, § 3(ii) (September 28, 2024); Government of India, 37/2024–25 § 3(ii) (October 23, 2024).

Table 5.5 India trade restrictions, September 2022–October 2024

Start date	Restriction	*Harmonized System* code and description	End date
September 9, 2022	Export duty 20 percent	1006.10 Paddy or rough	September 27, 2024
September 9, 2022	Export duty 20 percent	1006.20 Brown	September 27, 2024
September 9, 2022	Export duty 20 percent	1006.30.90 Non-Basmati	July 20, 2023
September 9, 2022	Ban	1006.40 Broken	Ongoing
July 20, 2023	Ban	1006.30.90 Non-Basmati	September 28, 2024
August 25, 2023	Export duty 20 percent	1006.30.10 Parboiled	September 27, 2024
August 27, 2023	Minimum export price, $1,200/mt	1006.30.20 Basmati	September 14, 2024
September 27, 2024	Export duty 10 percent	1006.10 Paddy or rough	October 22, 2024
September 27, 2024	Export duty 10 percent	1006.20 Brown	October 22, 2024
September 27, 2024	Export duty 10 percent	1006.30.10 Parboiled	October 22, 2024
September 28, 2024	Minimum export price, $490/mt	1006.30.90 Non-Basmati	October 23, 2024

Source: Government of India, 31/2015–20 § 3(ii) (September 8, 2022); USDA, FAS, *India: Grain and Feed Annual 2024*, March 29, 2024, 20; Government of India, 20/2023, § 3(ii) (July 20, 2023); Government of India, 49/2023 § 3(ii) (Customs), August 25, 2023; Government of India, 31/2024–25, § 3(ii) (September 28, 2024); Government of India, 37/2024–25 § 3(ii) (October 23, 2024); Codingest, "India Exempts Parboiled Rice and Brown Rice from Export Duty to Boost Shipments," October 23, 2024; Government of India, MCI, "Government Removes Floor Price on Basmati," September 14, 2024.

Despite restrictions on the export of non-basmati rice in place starting in July 2023, the Indian government permitted the export of non-basmati rice by private exporters through the national multi-state cooperative, National Cooperative Exports Limited, to countries in Africa and Southeast Asia for food security purposes. These countries include Kenya, Cameroon, Nepal, Malaysia, and the Philippines, among others. These contracts (or guarantees) ranged from 800 mt in the case of the Seychelles to 295,000 mt in the case of the Philippines.[439]

India also maintains high tariffs on all rice products that effectively prohibit imports. These have remained in place since the mid-1990s, when India imposed the tariffs in place of quantitative restrictions.[440] The tariff rate for paddy, brown, and broken rice is 80 percent; the tariff rate for milled rice is 70 percent.[441]

[439] Government of India, Export of Non-Basmati White Rice (under HS code 1006 30 90), 37/2023 § 3(ii) (October 18, 2023).
[440] Jha, Srinivasan, and Landes, "Indian Wheat and Rice Sector Policies and the Implications of Reform," May 1, 2007, 13.
[441] OECD, "AMIS Policy Database," accessed April 9, 2024.

Factors Affecting Competitiveness

Rice from India is highly competitive on the global market. Nonaromatic rice from India competes largely on price, partly attributable to government support via input subsidies, which lower delivered cost, and a minimum support price that incentivizes rice production and increases supply. India has also developed a niche market for basmati rice, which allows it to supply a differentiated product to higher-priced markets. However, production, particularly in states that grow basmati rice, is challenged by climate-related disruption.

Supportive Government Policies and Negative Impacts of Export Restrictions

Low costs of production, achieved through input subsidies, can have positive and negative effects on competitiveness. The government-provided input subsidies, which lower farm costs and boost production, may ultimately favor input-intensive crops, such as wheat and rice, over the production of others. For example, fertilizer subsidies lower the cost to produce fertilizer-intensive crops, which has shifted production in some states to rice and wheat.[442] Similarly, electricity and irrigation subsidies allow farmers to cheaply grow power- and water-intensive crops, such as wheat and paddy rice. This is especially the case for electricity subsidies because groundwater pumps require electricity for their use.[443] These subsidies lower the costs of production in the short term, but they have environmental costs that might impact future rice production and competitiveness in the long run, such as soil depletion and an overreliance on fertilizer, as well as groundwater depletion through overuse of groundwater pumps.

Additionally, although rice purchased by the government at the MSP is primarily for public stockholding purposes and is not eligible for export, the MSP guarantees a minimum price to farmers if a higher price cannot be obtained on the open market. The existence of the guarantee encourages production of rice, which can in turn can lead to greater exports.[444]

However, India's imposition of export restrictions on rice—previously in 2007–2011 and later beginning in 2022—create volatility in the global market and reduce the reliability of India as a supplier, especially to more food-insecure export destinations such as sub-Saharan Africa. The intention is to insulate domestic markets from high commodity prices, but some evidence shows that the restrictions may impact India's global competitiveness if countries shift to sourcing rice from countries without a history of sudden export restrictions.[445]

Indeed, the recent round of export restrictions has influenced the sourcing decisions of several sub-Saharan African countries. West African markets in particular shifted sourcing of rice imports toward

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[442] Rice and wheat consume over 52 percent of the nitrogen fertilizer used in India. DTB Associates, LLP, *Indian Grain Subsidies: A WTO Consistency Analysis*, January 2020; Shahane et al., "Nutrient Removal by Rice–Wheat Cropping System," December 15, 2020.

[443] DTB Associates, LLP, *Indian Grain Subsidies: A WTO Consistency Analysis*, January 2020.

[444] Fischer and Outlaw, "Indian Domestic Farm Support Disrupts Global Trade," December 22, 2021.

[445] During India's export restrictions, many importers sourced from Pakistan as an alternative supplier. It remains to be seen if importers switch back to India after India's export restrictions were relaxed in September 2024; it is possible that India's low prices may help rice exports remain competitive, despite policy uncertainties.

other suppliers.[446] For example, Senegal's rice imports from India decreased by 76 percent when comparing imports by quantity from year-to-date (YTD) July 2023 to YTD July 2024, as Senegal diversified its supplier base with imports from Pakistan, Brazil, Thailand, and Uruguay.[447]

Differentiated Aromatics and Specialty Varieties

Production and export promotion of basmati rice and specialty varieties in India create increased global competitiveness through product differentiation. As one of only three rice-producing countries growing basmati rice and one of two countries exporting it, India benefits from a long-standing reputation as a basmati rice producer, faces limited competition, and enjoys higher profit margins.[448] Despite higher input costs, basmati rice offers exporters higher rates of return.[449]

Indian rice producers, along with state and national governments, have worked to continue to develop customer recognition of the Indian rice "brand" by differentiating its specialty aromatic varieties (including sona masoori) (box 5.1).[450] These efforts to further differentiate Indian rice aim to position it as distinct from global producers of other aromatic rice such as jasmine and Texmati (a U.S.-grown basmati-type rice). India is also a reliable supplier of basmati rice, as production has steadily increased over the past decade.[451] Furthermore, global demand for basmati rice increased from 2018 to 2023 and is forecast to continue to increase as a result of rising incomes.[452] Notably, overall basmati exports grew in 2023 despite India's imposition (in August 2023) of a minimum export price that briefly dampened demand for basmati from India by increasing prices relative to Pakistan.[453] During that time, India's basmati exporters also reportedly faced higher logistics cost than Pakistan, the other key global supplier.[454]

Box 5.1 Geographical Indication for Basmati Rice

For more than a decade, India and Pakistan have been in a dispute over the geographical indication of basmati rice in the European Union (EU) market. The dispute centers on the claim to the exclusive rights to the name "basmati," potentially impacting their future competitiveness in the EU market.[a] India, which has long cultivated and is the current largest exporter of basmati rice, claims that the term is

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[446] S&P Global, General imports, HS heading 1006, rice, accessed various dates.
[447] S&P Global, Total exports, HS heading 1006, rice, YTD July 2024, accessed various dates.
[448] Basmati production occurs in India, Pakistan, and Nepal. Only India and Pakistan export significant amounts of basmati. Government of India, MCI, APEDA, "Basmati Rice," accessed August 28, 2024; Government of Pakistan, API, *Rice Paddy Policy Analysis for 2022-23 Crop*, July 2022, 46; Upreti, "The Battle for Geographical Indication Protection of Basmati Rice," May 2023, 719.
[449] Singh et al., "Adoption Pattern and Constraints Analysis of Basmati Rice," 2006, 108; *Financialexpress*, "Basmati Industry to Post Revenue Growth of 4%," September 19, 2024.
[450] *Rice Trader*, "Panel Discussion at the 2024 Global Rice Summit," June 7–8, 2024.
[451] USDA, FAS, Grain and Feed Annual: India, March 29, 2019, 19; USDA, FAS, Grain and Feed Annual: India, March 31, 2020, 18–19; USDA, FAS, Grain and Feed Annual: India, March 31, 2021, 9; USDA, FAS, Grain and Feed Annual: India, April 12, 2022, 10; USDA, FAS, Grain and Feed Annual: India, April 3, 2023, 15; USDA, FAS, Grain and Feed Annual: India, March 29, 2024, 14.
[452] Ghosal, "Exporters See Increased Demand as India Removes Basmati Rice MEP," September 14, 2024; industry ARC, "Basmati Rice Market Size Report, 2022-2027," accessed November 2, 2024.
[453] Monitoring Desk, "Pakistan's Low Price to Impact Indian Basmati Exports," February 29, 2024.
[454] Monitoring Desk, "Pakistan's Low Price to Impact Indian Basmati Exports," February 29, 2024.

intrinsically linked to its agricultural heritage, geography, and cultivation practices in regions like Punjab and Haryana.[b]

In 2016, India domestically registered basmati rice as a GI product through the Agricultural and Processed Food Products Export Development Authority and subsequently filed for a protected geographical indication with the EU in 2018. India emphasized that the unique characteristics are essentially attributable to the specific climate, soil, and cultivation methods found in these regions.[c] By establishing the relationship between the specific geographic regions in India and its product, India aims to protect the purported cultural integrity of Indian basmati rice and enhance its economic value in international markets.

Pakistan contested India's claim and filed a Notice of Opposition with the EU against India's application in 2020. Pakistan suggested that the term "basmati" should be regarded as a shared cultural heritage, because the rice is grown in several Pakistani provinces, particularly in Punjab.[d] The Pakistani government expressed concerns that India's registration could diminish its farmers' access to the EU market, where Pakistan is currently the largest exporter of basmati rice.[e] In August 2023, Pakistan filed an application for its own protected geographical indication for basmati rice with the EU.[f]

India responded to Pakistan's application with a Notice of Opposition from India, in addition to Nepal and the Indian state of Madhya Pradesh.[g] In April 2024, the EU republished Pakistan's PGI application for basmati rice under Article 49(5).[h] Subsequently, Italy, with support from Bulgaria, Romania, Spain, and Greece, filed a Notice of Opposition to Pakistan's application, which the EU accepted, expressing concerns about Pakistan's social and environmental sustainability in its rice production.[i] The EU added that Pakistan's low-priced product threatens the European rice industry.[j]

[a] Geographical indications are defined as indications for products that originate from specific territories or regions and where quality, reputation, or other characteristics are attributed to the geographic area. In 2008, India and Pakistan had agreed to a joint GI filing of Basmati; however, that agreement fell through after the terrorist attacks in Mumbai by members of the Pakistan terrorist group Lashkar-e-Taiba. EC, "Geographical Indications," accessed December 19, 2024. Singh, "Amid Dispute between India and Pakistan over Basmati GI Tag, New Zealand Rejects India's Application," July 5, 2024, Neo, "Bringing to the Boil," March 22, 2023.

[b] EC, "Publication of an application for registration of a name 2020/C 301/12," September 11, 2020.

[c] A protected geographical indication establishes the relationship between the name of the product and a specific geographical region, where quality, reputation, or other characteristics are attributed to the geographic area. EC, "Geographical Indications and Quality Schemes Explained," accessed December 19, 2024. EC, "Publication of an application for registration of a name 2020/C 301/12," September 11, 2020.

[d] Biswakarma, "Who Owns Basmati Rice?," July 6, 2021.

[e] Dieterich, "The Basmati Rice War between India and Pakistan," February 26, 2024.

[f] EC, "Publication of an application for registration of a name C/2024/1713," February 23, 2024.

[g] Reportedly, Nepal also produces basmati but virtually all is consumed domestically. Singh, "Amid Dispute between India and Pakistan over Basmati GI Tag, New Zealand Rejects India's Application," July 5, 2024; Upreti, "The Battle for Geographical Indication Protection of Basmati Rice," May 2023, 719. Prasain, "Let Them Eat Rice," August 8, 2023.

[h] By invoking Article 49(5), Pakistan's application must show that basmati is protected in its country of origin (India). EC, "Publication of an application for registration of a name C/2024/2995. EU, "Regulation (EU) No 1151/2012," April 23, 2024; November 21, 2012; HAS Rice, "India's Advantage as EU Publishes Pakistan's Plea for Basmati Rice GI Tag under New Clause," May 28, 2024.

[i] Mancombu, "Pakistan," September 25, 2024.

[j] Mancombu, "Pakistan," September 25, 2024.

Climate-Related Disruptions

One of the largest challenges to Indian reliability of supply concerns production disruptions caused by increases in climate-related variability. As described above, in "Government Programs: Trade Restrictions," the government of India is inclined to limit exports of rice in cases when production is lower than predicted due to perceived food security risks.[455] Changes in rainfall patterns that transform into late and erratic monsoons can cause periods of drought followed by periods of flooding that delay planting. Extreme temperatures can cause early maturation in rice plants. Both types of disruptions limit yields. In extreme cases, the volatile climate conditions can cause total crop loss.

There are several recent examples of the toll of climate-related disruptions on Indian production. The 2024 monsoon continued later than usual, resulting in flooding, water logging, and crop damage in rice.[456] In 2022, a delayed monsoon and high heat led to drought-like conditions resulting in delayed planting and a 13 percent reduction in area under rice production.[457] According to IRRI, severe drought can lead to an estimated 40 percent yield loss.[458] In addition, the water table in Punjab has been dropping at an accelerated rate, from an average of 0.18 meters annually in the 1980s to an average of 0.49 meters from 2010 to 2019.[459] The water table decline has resulted in a reported 150,000 hectare loss of rice-producing land.[460]

Efforts are ongoing to mitigate challenges caused by climate variability. The irrigation network in some states alleviates uncertainty around monsoon patterns, though these states face the double threat of the ongoing drop in water tables alongside increased temperatures. For example, in Punjab and Haryana, state officials concerned about the water-intensive nature of rice production are implementing restrictions on the timing of transplanting. Reportedly, some states are providing government incentives to encourage more water-efficient practices such as direct seeding and alternate wetting and drying.[461] However, government support is varied and can be insufficient in some states.[462] In Haryana, the government is providing subsidies to farmers to encourage moving away from paddy production entirely to less water-intensive crops.[463] Furthermore, one-third of rice production across India does not occur on

[455] USDA, FAS, *India Bans the Export of Non-Basmati White Rice*, August 31, 2023, 2–3; Valera et al., "Domestic and International Impacts of Rice Export Restrictions," June 2024, 1; Shagun, "Export Bans, Restrictions," April 12, 2024.
[456] USDA, FAS, *Monsoon Withdrawal Delayed*, October 2, 2024, 1–2.
[457] Rehbar, "Climate Change Is Hurting India's Rice Crop," September 9, 2022; Parija and Beniwal, "India's Faltering Rice Output Can Cause a New Food Crisis," August 3, 2022.
[458] IRRI, "Climate-Smart Rice," August 24, 2018.
[459] Columbia Water Center, "Punjab, India," accessed November 1, 2024; Shankar, "Accelerating Rate of Groundwater Depletion in Punjab, Worries Farmers and Experts," June 14, 2022; Sidhu, Sharda, and Singh, "Spatio-Temporal Assessment of Groundwater Depletion in Punjab, India," February 1, 2021, Table 4.
[460] 1.5 lakh hectares is equivalent to 150,000 hectares. Subject matter expert, interview by USITC staff, Ludhiana, India, June 14, 2024.
[461] Foreign government representatives, interviews by USITC staff, Haryana, India, June 12, 2024; industry representative, interview by USITC staff, New Delhi, India, June 10, 2024; Johar et al., "Revitalizing South Asia's Groundwater Resources with Direct-Seeded Rice," October 2, 2023.
[462] Stein, "How India's Rice Production Can Adapt to Climate Change Challenges," March 11, 2021, 427.
[463] Foreign government representatives, interviews by USITC staff, Haryana, India, June 12, 2024; Gulati and Singh, "Repurpose Subsidies and Offer MSP for Other Crops," July 22, 2024.

irrigated land and depends wholly on rainfall, leading to great uncertainty about production during periods when the monsoon is disrupted.[464]

Pakistan

Rice is important to Pakistan's economy, and the country was a consistent exporter of both basmati and nonaromatic rice varieties to the global rice market. Rice contributed 2.5 percent to total agricultural value added and 0.6 percent to gross domestic product (GDP) in Pakistan in MY 2023/24.[465] Rice was the country's top agricultural export and second-largest overall export product, after textiles.[466] Pakistan was the world's ninth-largest producer of rice in MY 2023/24.[467] Domestically, however, wheat remains the country's main staple food.[468] In Pakistan, the population consumes less rice than in other countries in South Asia.[469] As a result of high production and low consumption, Pakistan's rice farmers regularly produce more rice than the country's population consumes, creating a large surplus for exports.

Production

Pakistan was a steady producer of rice during 2018 to 2023, despite one major weather event. Between MY 2018/19 and MY 2023/24, Pakistan contributed about 1 percent of global rice production.[470] Annual milled production mostly increased during the six-year period but experienced a dip in MY 2022/23, after severe, widespread flooding.[471] The following year, MY 2023/24, production reached a high of 9.9 million mt (table 5.6). In MY 2021/22, about 40 percent of production by volume was basmati rice and 60 percent was non-basmati rice (the predominant non-basmati variety produced was a nonaromatic long grain variety called IRRI-6).[472] The overall growth in production of the past several years was attributed to increased production of nonaromatic long grain rice varieties (also referred to as hybrid rice).[473]

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[464] Government of India, MAFW, ESD, "Agricultural Statistics at a Glance 2022," 2022, 28–29.

[465] Government of Pakistan, Economic Advisor's Wing, *Pakistan Economic Survey 2023–24*, June 2024, 23.

[466] USITC, hearing transcript, April 30, 2024, 6 (testimony of Ahsan Ali Mangi, Additional Secretary, Ministry of Commerce, Pakistan) and 11 (testimony of Ali Narang, Managing Member Committee, Rice Exporters Association of Pakistan); Government of Pakistan, MNFSR, *Agricultural Statistics of Pakistan 2022–23*, May 2024, 8, 216–17.

[467] USDA, FAS, "PSD Online database," accessed various dates.

[468] USDA, FAS, *Grain and Feed Annual: Pakistan*, April 1, 2024, 8.

[469] USDA, FAS, "PSD Online database," accessed various dates.

[470] Data in the production, consumption, and stock sections are based on marketing year unless otherwise noted. USDA, FAS, PSD Online, "Rice Production, All Countries, 2024," accessed various dates.

[471] USDA, FAS, *Grain and Feed Annual: Pakistan*, March 31, 2023, 7; Government of Pakistan, Ministry of Finance, *Pakistan Floods 2022 Impact Assessment*, accessed April 11, 2024, 281; S&P Global, Total exports, HS heading 1006, rice, accessed various dates.

[472] The latest production data by type available are for MY 2021/22. The term "non-basmati" includes all other types of rice besides basmati, and in Pakistan about 80 percent of the non-basmati rice paddy area was sown with IRRI-6, a nonaromatic long grain rice. Government of Pakistan, API, *Rice Paddy Policy Analysis for 2022–23 Crop*, July 2022, 25 and 29.

[473] USDA, FAS, *Grain and Feed Annual: Pakistan*, April 1, 2024, 7.

Pakistan's area harvested and yields were also negatively affected by the MY 2022/23 flooding, but both rebounded the following year.[474] The period concluded with a 29 percent increase in area harvested in MY 2023/24 compared to MY 2018/19, to 3.6 million hectares, a result of both a higher global price that encouraged farmers to plant and favorable conditions at harvest time.[475] Yields rose to 4.1 mt/ha, boosted by farmers' adoption of higher yielding long grain hybrid varieties.[476]

Table 5.6 Pakistan: rice production, consumption, stocks, and trade for marketing years 2018/19–2023/24

In metric tons (mt), hectares (ha), kilograms (kg), metric tons per hectare (mt/ha), and percentages (%).

Attribute	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
Beginning stocks (1,000 mt)	1,430	947	940	1,788	2,377	2,024
Production (milled) (1,000 mt)	7,202	7,206	8,420	9,323	7,322	9,869
Area harvested (1,000 ha)	2,810	3,041	3,335	3,537	2,975	3,637
Yield (rough) (mt/ha)	3.9	3.6	3.8	4.0	3.7	4.1
Imports (1,000 mt)	8	7	7	5	7	5
Consumption and residual (1,000 mt)	3,200	3,400	3,700	3,900	3,925	4,000
Exports (1,000 mt)	4,493	3,820	3,879	4,839	3,757	6,400
Ending stocks (1,000 mt)	947	940	1,788	2,377	2,024	1,498
Exports-to-production ratio (%)	62.4	53.0	46.1	51.9	51.3	64.8
Ending stocks-to-use ratio (%)	12.3	13.0	23.6	27.2	26.3	14.4
Per capita consumption (kg)	15.4	15.5	16.6	17.2	17.0	17.0

Source: USDA, FAS, PSD Online database, accessed September 13, 2024; World Bank, Data: Population, accessed September 13, 2024.

Note: Per capita consumption was calculated using marketing year apparent consumption divided by calendar year population. All other data, including imports and exports, are based on the marketing year.

Consumption and Stocks

Pakistan, as stated above, is not a major consumer of rice products; domestically, buyers generally prefer wheat-based products over rice.[477] In Pakistan, rice is reported to be reserved mostly for ceremonies and festive occasions.[478] However, consumption has been increasing.[479] Pakistan's estimated per capita rice consumption grew steadily from 15.4 kg per person in MY 2018/19 to a peak of 17.2 kg per person in MY 2021/22, and then leveled off at 17.0 kg per person in MY 2022/23 and MY 2023/24 (table 5.6). In general, less than half of domestic production is consumed within the country.[480]

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[474] In MY 2019/20, yields dropped, and production was nearly stagnant, in a slight deviation from the upward trend. This deviation was attributed to temperature fluctuations before harvest in 2019. USDA, FAS, *Grain and Feed Annual: Pakistan*, April 23, 2020, 7; USDA, FAS, PSD Online database, accessed September 13, 2024; USDA, FAS, *Grain and Feed Annual: Pakistan*, March 31, 2023, 7; USDA, FAS, *Grain and Feed Annual: Pakistan,* April 1, 2024, 7; Government of Pakistan, Ministry of Finance, *Pakistan Floods 2022 Impact Assessment*, accessed April 11, 2024.

[475] USDA, FAS, PSD Online database, accessed September 13, 2024; USDA, FAS, *Grain and Feed Annual: Pakistan*, April 1, 2024, 7–8.

[476] U.S. government official, interview by USITC staff, August 19, 2024; USDA, FAS, *Grain and Feed Annual: Pakistan*, April 1, 2024, 7.

[477] Pakistan's estimated per capita consumption of wheat was 124 kg of wheat versus 17 kg of rice in MY 2023/24. USDA, FAS, *Grain and Feed Annual: Pakistan*, April 1, 2024, 4, 8.

[478] Industry experts, interview by USITC staff, August 19, 2024; USDA, FAS, *Grain and Feed Annual: Pakistan*, April 1, 2024, 8; USDA, FAS, *Grain and Feed Annual: Pakistan*, June 24, 2021, 9.

[479] Industry experts, interview by USITC staff, August 19, 2024; USDA, FAS, *Grain and Feed Annual: Pakistan*, April 1, 2024, 8; USDA, FAS, *Grain and Feed Annual: Pakistan*, June 24, 2021, 9.

[480] USDA, FAS, *Grain and Feed Annual: Pakistan*, June 24, 2021, 9.

Domestic consumers reportedly prefer basmati if they can afford it.[481] In addition, the use of broken rice in animal feed accounts for about 200,000 mt of rice per year.[482]

Ending stock levels varied widely over the period. The government of Pakistan does not have a stockholding program for rice; thus, stocks in Pakistan are privately held.[483] Ending stocks in MY 2020/21–2022/23 were more than double those of MY 2018/19 and MY 2019/20 but declined in MY 2023/24 to 1.5 million mt, or 14.4 percent of annual use (table 5.6). Particularly in 2021, Pakistan's industry reportedly faced a combination of high domestic production and delays in port operations that slowed exports, which contributed to end stock increases during this period.[484]

Trade

During 2018–23, Pakistan's rice industry primarily supplied export markets, and imported rice volumes were low. Pakistan was the world's fourth-largest exporter in 2023 and supplied an average of about 9 percent of world rice exports by volume each year during 2018–23.[485] Pakistan's rice exports were equivalent to more than half its production of rice in all years except 2020/21 (table 5.6). In 2023, Pakistan exported a total of 4.6 million mt of all types of rice, up 17.9 percent from 3.9 million mt in 2018 (table 5.7). Pakistan's total exports increased by 70 percent from MY 2022/23 to 2023/24 (table 5.5). This increase happened after India put a ban on exports of non-basmati rice in July 2023.[486] Milled rice constituted the majority (3.2 million mt) of total exports in 2023. Basmati made up 20.0 percent of all milled rice exports by volume and 34.9 percent of milled rice exports by value.[487] Broken rice was most of Pakistan's remaining exports, with 1.0 million mt of broken rice exported in 2023. Brown rice made up 286,651 mt of exports. Pakistan's limited volume of imports consisted almost entirely of rice in the husk sourced from China. About half of rice in the husk imports were reportedly hybrid rice seed.[488]

[481] USDA, FAS, *Grain and Feed Annual: Pakistan*, June 24, 2021, 9.
[482] USDA, FAS, *Grain and Feed Annual: Pakistan*, April 1, 2024, 8.
[483] Industry experts, interview by USITC staff, August 19, 2024.
[484] USDA, FAS, *Grain and Feed Annual: Pakistan*, June 24, 2021, 10.
[485] S&P Global, General imports, HS Heading 1006, rice, accessed various dates.
[486] Annual data do not reveal the increase in exports from Pakistan that began in the first part of MY 2023/24. Based on annual data, Pakistan's total exports decreased 1 percent from 2022 to 2023, which was largely due to decreased exports to China. However, monthly data show that by November 2023, exports from Pakistan to other markets that overlap with India as export destinations (e.g., Senegal, Côte d'Ivoire, and Togo) increased by over 200 percent year over year. S&P Global, Total exports, HS heading 1006, rice, accessed various dates.
[487] REAP, "Exports," accessed July 30, 2024.
[488] Pakistan imported $39.6 million in rice in 2023 (10,241 mt), $39.5 million (10,071 mt) of these imports were rice seed for sowing (Indian tariff line 1006.10.10) from China. Volza, "Hybrid Rice Seed Exports from China to Pakistan," accessed August 22, 2024; S&P Global, General imports, HS heading 1006, rice, accessed various dates.

Table 5.7 Pakistan: exports of rice, by major market, 2018–23
In thousands of metric tons.

Trade partner	2018	2019	2020	2021	2022	2023
Afghanistan	281	211	365	317	516	531
Indonesia	312	175	134	37	99	374
Malaysia	58	55	130	321	387	372
Kenya	460	450	357	229	353	347
United Arab Emirates	165	336	198	204	353	251
Tanzania	191	146	107	54	109	228
Senegal	108	113	62	21	28	175
Djibouti	13	70	50	22	16	161
China	350	712	642	935	1,034	161
Philippines	67	84	11	38	127	150
All others	1,926	2,237	1,928	1,808	1,581	1,811
Total	3,932	4,589	3,986	3,986	4,604	4,560

Source: S&P Global, Total exports, HS heading 1006, rice, accessed August 2, 2024.

Pakistan exported rice to more than 100 countries; the top five export markets by quantity accounted for 41 percent of Pakistan's total rice exports in 2023 (table 5.7). In 2023, Pakistan sent 12 percent of its total rice exports to Afghanistan, its largest single country destination market that year.[489] More than two-thirds of Afghanistan's imports from Pakistan that year were broken rice, but this share was significantly smaller in other years during this period.[490] Afghanistan also imported milled, non-basmati rice from Pakistan. In all other years, China was Pakistan's largest single country export market; it received 22 percent of Pakistan's total rice exports in 2022.[491] From 2018 to 2020, milled, non-basmati rice made up the largest share of Pakistan's rice exports to China. Later, in 2021 and 2022, Pakistan exported significantly higher volumes of broken rice to China.[492] In 2023, however, as broken rice prices increased, demand in China fell.[493] Pakistan supplied Indonesia intermittently, depending on whether exporters were able to secure contracts with the government of Indonesia.[494] In Malaysia, a newer market for Pakistan's non-basmati rice, exports increased sixfold, from 58,000 mt in 2018 to 372,000 in 2023.[495] Africa was a leading regional destination market for Pakistan.[496] The region received 35 percent of Pakistan's total exports in 2023, primarily non-basmati white rice.[497] Kenya was Pakistan's top export market in Africa throughout the period.[498]

Pakistan also gained market share in Haiti, a smaller, more distant market. Pakistan exported 5,500 mt of rice to Haiti in 2021. The following year, Pakistan's rice exports fell to zero, then increased

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[489] S&P Global, Total exports, HS heading 1006, rice, accessed various dates.
[490] S&P Global, General imports, HS subheading 1006.40, broken rice, accessed various dates.
[491] S&P Global, General imports, HS heading 1006, rice, accessed various dates.
[492] S&P Global, Total exports, HS subheading 1006.40, broken rice, accessed various dates.
[493] U.S. government official, interview by USITC staff, August 19, 2024.
[494] By August 2024, Bulog, Indonesia's food distribution company, reported that it imported 2.5 million metric tons of its total 3.6 million metric tons rice import authorization for 2024. Of these rice imports, Pakistan accounted for a 17.2 percent share compared to Thailand (40.5 percent), Vietnam (27.6 percent), and Burma (11.0 percent) during the period of January – May 2024. USDA, FAS, *Grain and Feed Annual: Indonesia*, August 6, 2024, 16.
[495] USITC, hearing transcript, April 30, 2024, 7 (testimony of Ahsan Ali Mangi, Additional Secretary, Ministry of Commerce, Pakistan); S&P Global, GTAS database, Exports, HS Heading 1006, accessed various dates.
[496] S&P Global, Total exports, HS heading 1006, rice, accessed various dates.
[497] S&P Global, Total exports, HS heading 1006, rice, accessed various dates.
[498] S&P Global, Total exports, HS heading 1006, rice, accessed various dates.

substantially to about 122,000 mt in 2023.[499] In 2023, rice from Pakistan accounted for 20 percent of Haiti's total import market share—the United States previously supplied nearly all of Haiti's rice imports.[500] Industry experts noted that Pakistani rice was competitively priced, of comparable quality to U.S. rice, and reliably available during Haiti's political crisis for reasons described in chapter 9.[501]

Pakistan is the world's largest supplier of basmati rice after India. Exports from Pakistan amounted to over one-third of global basmati rice exports.[502] Pakistan exported an average of 645,000 mt of basmati from 2018 to 2023, equivalent to 16 percent of Pakistan's total rice exports on average. By value, basmati was equivalent to 29 percent of Pakistan's total rice exports on average.[503] Basmati exports from Pakistan were sent mostly to the Middle East (the United Arab Emirates, Saudi Arabia, Oman, Qatar, and Bahrain) and the EU (specifically, France, Germany, Italy, the Netherlands, and Spain).[504] In 2023, Pakistan supplied only about 1 percent its total exports of rice by value to the United States, but Pakistan held 4 percent of the U.S. rice import market share by value.[505] Most of these imports (89.3 percent by value) were basmati rice.[506]

Industry Structure

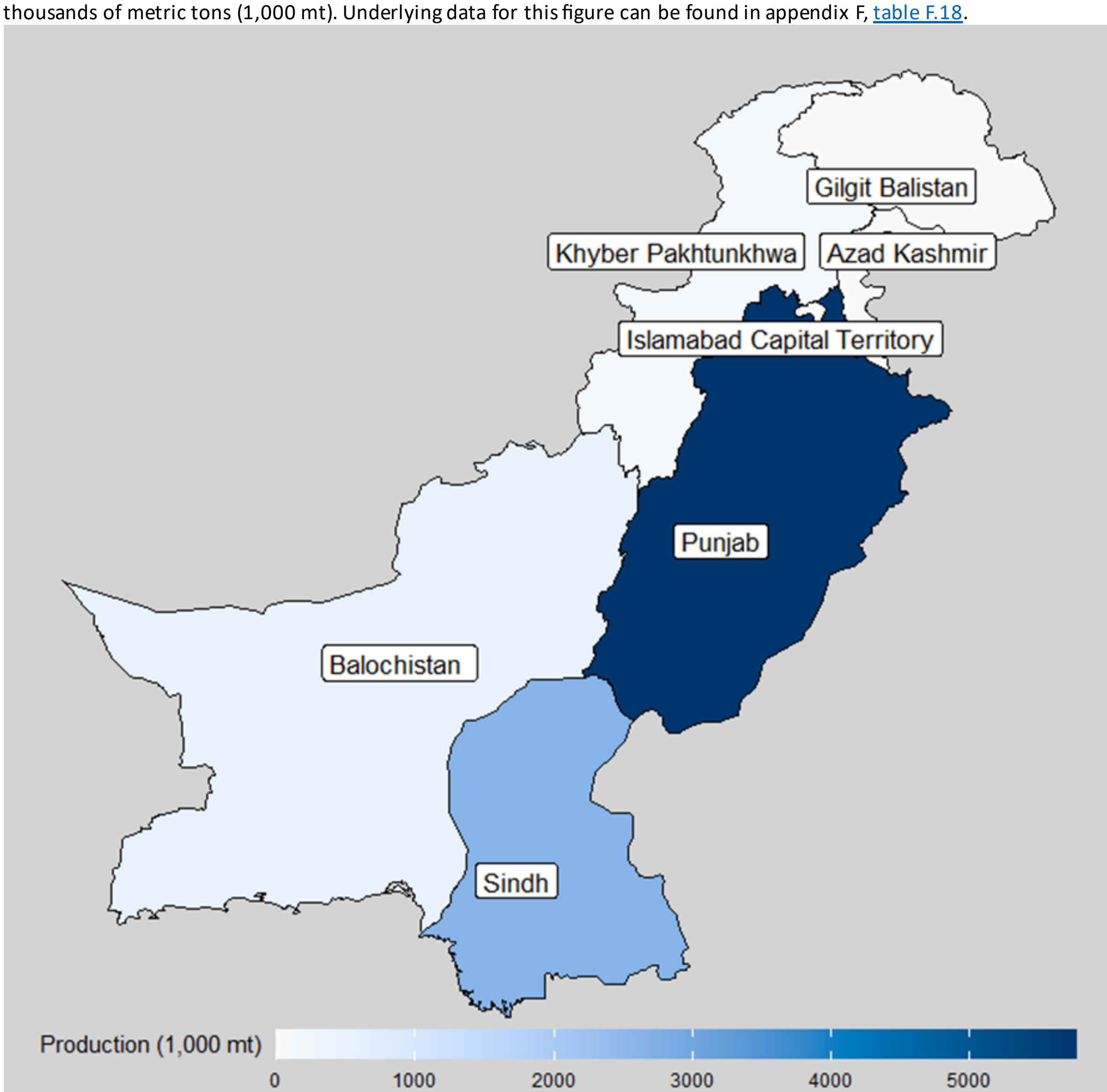
In Pakistan, rice is mainly produced in four provinces: Punjab, Sindh, Balochistan, and Khyber Pakhtunkhwa (figure 5.6). Punjab contributed 61 percent of total rice production on average from MY 2019/20 to MY 2021/22 (the latest available data by province).[507] Punjab produced nearly all the country's basmati rice and almost one-third of its non-basmati rice.[508] From MY 2019/20 to MY 2021/22, Sindh contributed almost 31 percent of total rice production and benefitted from ideal conditions for non-basmati rice production.[509] Sindh grew more than half the country's non-basmati rice, along with a small share of basmati.[510] Khyber Pakhtunkhwa and Balochistan contributed the remaining 8 percent of

[499] S&P Global, Total exports, HS heading 1006, rice, accessed various dates; USDA, FAS, *Grain and Feed Annual: Haiti*, April 17, 2024, 6.
[500] USDA, FAS, *Grain and Feed Annual: Haiti*, April 17, 2024, 6.
[501] USDA, FAS, *Grain and Feed Annual: Haiti*, April 17, 2024, 6.
[502] Hussain, "Rice Battle Heats up as India, Pakistan Revise Export Policies," accessed October 23, 2024.
[503] REAP, "Exports," accessed July 30, 2024.
[504] Other Middle East markets for Pakistan include Oman and Yemen. USITC, hearing transcript, April 30, 2024, 8 (testimony of Ahsan Ali Mangi, Additional Secretary, Ministry of Commerce, Pakistan); USDA, FAS, *Grain and Feed Annual: Pakistan*, April 1, 2024, 8–9.
[505] USITC, hearing transcript, April 30, 2024, 7 (testimony of Ahsan Ali Mangi, Additional Secretary, Ministry of Commerce, Pakistan); S&P Global, Total exports, HS heading 1006, rice, accessed various dates; S&P Global, General imports, HS heading 1006, rice, accessed various dates.
[506] S&P Global, General imports, HS heading 1006, rice, accessed various dates.
[507] Government of Pakistan, API, *Rice Paddy Policy Analysis for 2022–23 Crop*, July 2022, 3 and 29.
[508] Government of Pakistan, API, *Rice Paddy Policy Analysis for 2022–23 Crop*, July 2022, 3 and 29.
[509] USDA, FAS, *Grain and Feed Annual: Pakistan*, April 1, 2024, 8; USDA, FAS, "Pakistan Rice Area, Yield and Production," October 11, 2024; Government of Pakistan, API, *Rice Paddy Policy Analysis for 2022–23 Crop*, July 2022, 3 and 29.
[510] Although some reports stated that basmati production is limited to specific districts in Punjab, Pakistan's government reported some basmati production in Sindh, which accounted for around 3 percent of Pakistan's basmati production on average from MY 2019/20 to MY 2021/22. USDA, FAS, *Grain and Feed Annual: Pakistan*, April 1, 2024, 8; USDA, FAS, "Pakistan Rice Area, Yield and Production," October 11, 2024; Government of Pakistan, API, *Rice Paddy Policy Analysis for 2022–23 Crop*, July 2022, 3 and 29.

rice production on average from MY 2019/20 to MY 2021/22. Rice producers in Pakistan are typically smallholders, cultivating 0.4 to 2.4 hectares; however, some larger farms are about 10 to 20 hectares in size.[511]

Figure 5.5 Pakistan: rice production by province, marketing year 2022/23

In thousands of metric tons (1,000 mt). Underlying data for this figure can be found in appendix F, table F.18.



Source: Government of Pakistan, Agriculture Policy Institute, Ministry of National Food Security and Research, Rice Paddy Policy Analysis for 2022–23 Crop, July 2022, 29.

[511] Most recent data on farm sizes are from Pakistan's 2010 Agricultural Census, which reported that 64 percent of farms were 2 hectares or less, 25 percent of farms were between 2 and 5 hectares, and 7 percent were between 5 and 10 hectares. The remaining farms fell between 10 and 40 hectares. Ali, *Rice Sector of Pakistan*, 2020, 9; Government of Pakistan, Pakistan Bureau of Statistics, "Agricultural Census 2010 Tables," accessed December 4, 2024, 1.

Low levels of mechanization on Pakistan's farms resulted in mostly manual production of rice. Farm-level rice production in Pakistan relies on family members, as well as low cost hired labor, to perform the bulk of rice-production tasks.[512]

Only a small portion of rice farmers in Pakistan reported use of improved planting and harvesting techniques.[513] Improved rice cultivation requires mechanization beyond tractor use, such as the use of transplanters and rice-specific harvesters (e.g., Kubota brand harvesters) or combine harvesters.[514] In response, Punjab State and Central government funded the National Program for Enhancing Profitability through Increasing Productivity of Rice. The first phase in 2019–20 was focused on increased mechanization in rice production via subsidized machinery.[515] Without government support, mechanization is difficult for Pakistan's rice farmers to afford, especially because production is largely subsistence level and farmers in Pakistan typically have only one harvest of rice per year. By contrast, farmers that have two to three crop cycles per year to increase profits can afford the cost of mechanization.[516]

Most rice in Pakistan is rainfed by monsoons, but the country has plentiful access to supplemental irrigation. In the *Kharif* season, which in Pakistan runs from May to September, rice was the second most planted crop during the recent period, after wheat.[517] Snowpack and rainfall into the Indus Basin are the sources of most of Pakistan's irrigation water, supported by five rivers, and delivered via an extensive water resource asset system (e.g., dams, barrages, weirs, and canals).[518] In addition to canal irrigation, farmers supplement with groundwater, supplied by tube wells, run by electricity, diesel, and solar power.[519] In general, basmati rice varieties in Pakistan are late maturing, lower yielding, and require more water than long grain varieties.[520] As a result, basmati rice production costs are higher than costs for long grain rice production.[521] Climate pressures have reportedly pushed farmers into growing more

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[512] U.S. government official, interview by USITC staff, August 19, 2024.

[513] One source reported less than 10 percent of Pakistan's farmers used harvesters and dryers; another said less than 1 percent are mechanized. U.S. government official, interview by USITC staff, August 19, 2024; industry expert, interview by USITC staff, November 21, 2024; PERI, *Mid-Term Evaluation of National Programme for Enhancing Profitability through Increasing Productivity*, 2022, 2; FAO, *Agricultural Mechanization for Smallholder Farmers in Pakistan*, October 7, 2024, 1-4.

[514] FAO, *Agricultural Mechanization for Smallholder Farmers in Pakistan*, October 7, 2024, 4.

[515] Punjab Extension and Adaptive Research, "National Program for Enhancing Profitability through Increasing Productivity of Rice," accessed October 8, 2024; PERI, *Mid-Term Evaluation of National Programme for Enhancing Profitability through Increasing Productivity*, 2022, 1–8.

[516] Business Recorder (Web Desk), "An Interview with Shahjahan Malik, Chairman Rice Exporters Association of Pakistan (REAP)," February 7, 2022.

[517] USDA, FAS, *Grain and Feed Annual: Pakistan*, April 1, 2024, 7; USDA, FAS, "Pakistan Rice Area, Yield and Production," October 11, 2024; USDA, FAS, *Grain and Feed Annual: Pakistan*, April 23, 2020, 7.

[518] U.S. government official, interview by USITC staff, August 19, 2024; Government of India, "Indus Basin," March 2014, iii and 9.

[519] U.S. government official, interview by USITC staff, August 19, 2024; Ahmad, "Pakistan's Rice-Water Dilemma," May 13, 2024.

[520] Industry expert, interview by USITC staff, November 21, 2024.

[521] For example, in MY 2021/22, the average basmati farm gate costs in Punjab $8.59/40kg and average basmati yield in Pakistan was 833 kg per ha, compared to farm gate costs in Sindh of $5.31–$6.32/40 kg and Pakistan-wide yields of 1,274 kg per ha for non-basmati varieties; the average basmati farm gate costs in Pakistan. Government of Pakistan, API, *Rice Paddy Policy Analysis for 2022–23 Crop*, July 2022, 11 and 29; U.S. Treasury, "Fiscal Data," December 31, 2022.

long grain varieties, which feature more hybrid seed options that perform better in more volatile environmental conditions.[522]

Pakistan's farmers have increased their use of hybrid rice varieties, which increased yields. By 2023, farmers had access to at least eight hybrid varieties.[523] The hybrid adoption rate for the period was about 70 percent for the country and 80 percent in Sindh, where most of the country's long grain rice is grown.[524] Both imported and locally produced hybrid varieties have contributed to the improved yields.[525] Starting in 2015, Pakistan's Federal Ministry for Food Security and Research collaborated with China to source higher-yielding rice varieties from China.[526] At the same time, the private sector has invested in hybrids produced locally in Pakistan.[527] During 2018 to 2023, hybrid varieties gained acceptance in export markets, as Chinese customers purchased rice produced in Pakistan from these newer varieties.[528] The development of hybrid basmati varieties lags behind nonaromatic long grain varieties, however, because scientists have less genetic material to use to create hybrids.[529]

In Pakistan wholesalers purchase rice at the farm or at mandis (wholesale markets) and aggregate rice for sales to mills. Wholesalers are often "shellers" as well.[530] Shellers remove the outer husk of the rice to detach the bran-covered rice from the paddy (dehulling) and then sell "shelled" or husked brown rice to millers.[531] Pakistan's wholesalers play a vital aggregation role because Pakistan's rice farms are very small and geographically dispersed; however, wholesalers also have the power to set the price of rice, and they reportedly took advantage of their position at times by hoarding supplies.[532]

Millers in Pakistan purchase rice from wholesalers to produce white and parboiled rice, and many of these millers also export their rice.[533] Pakistan had a reported 1,782 millers in MY 2015/16 (the latest year for which data were available), up from 315 in MY 2005/06.[534] The milling sector featured many medium-sized mills and a few large mills.[535] Private sector investment in state-of-the-art milling equipment took place over several previous decades, and milling rates remain comparable to India and Bangladesh.[536] Millers in Pakistan generally export bulk, unpackaged rice, and branded product is

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[522] Industry expert, interview by USITC staff, November 21, 2024; Business Recorder (Web Desk), "An Interview with Shahjahan Malik, Chairman Rice Exporters Association of Pakistan (REAP)," February 7, 2022.
[523] USITC, hearing transcript, April 30, 2024, 6 (Ahsan Ali Mangi, Additional Secretary, Ministry of Commerce).
[524] U.S. government official, interview by USITC staff, August 19, 2024; USDA, FAS, *Grain and Feed Annual: Pakistan*, March 31, 2023, 7.
[525] Government of Pakistan, MNFSR, "Video Speech of the Honourable Federal Minister," November 18, 2021.
[526] Ali, *Rice Sector of Pakistan*, 2020, 6.
[527] Business Recorder (Web Desk), "An Interview with Shahjahan Malik, Chairman Rice Exporters Association of Pakistan (REAP)," February 7, 2022.
[528] Industry expert, interview by USITC staff, November 21, 2024; USDA, FAS, *Grain and Feed Annual: Pakistan*, March 31, 2023, 8. S&P Global, GTAS database, Exports, HS Heading 1006, accessed various dates.
[529] Industry expert, interview by USITC staff, November 21, 2024.
[530] Ali, *Rice Sector of Pakistan*, 2020, 9; Business Recorder (Web Desk), "An Interview with Shahjahan Malik, Chairman Rice Exporters Association of Pakistan (REAP)," February 7, 2022.
[531] Ali, *Rice Sector of Pakistan*, 2020, 9.
[532] Ali, *Rice Sector of Pakistan*, 2020, 9–10.
[533] Ali, *Rice Sector of Pakistan*, 2020, 9–10.
[534] Government of Pakistan, MNFSR, *Agricultural Statistics of Pakistan 2022–23*, May 2024, 288.
[535] Ali, *Rice Sector of Pakistan*, 2020, 9.
[536] USDA, FAS, *Grain and Feed Annual: Pakistan*, April 23, 2020, 10; USDA, FAS, PSD Online, Rice Milling Rates, accessed various dates.

minimal.[537] Brand development for rice has been low because Pakistani exporters focused on bulk shipments to the Middle East and the EU.[538]

In comparison to transportation systems in India and Bangladesh, Pakistan is a comparatively low performer in terms of road and port infrastructure quality and efficiency metrics. In 2024, Pakistan ranked 64 of 100 countries for road and port quality as reported by local business executives, below India (ranked 25th) and Bangladesh (ranked 37th).[539] In Pakistan, containers were held in ports and intermediate inland locations (consolidated dwell time) longer on average (5.8 days) than in India (5.0 days) and Bangladesh (1.7 days).[540] In 2007, Pakistan constructed a new port in Balochistan, funded by the China-Pakistan Economic Corridor agreement.[541] However, the project has not performed as expected because of a low volume of shipments.[542] Despite the port's underperformance, Pakistan's increased exports of rice to China are reportedly the result of the agreement's trade linkages.[543]

Government Programs

As noted above, most of Pakistan's rice production is exported, and the government's policies thus focus on promoting export competitiveness. The government of Pakistan intervenes minimally in its rice industry with no involvement in the procurement, storage, and export of rice.[544] Formerly, the Rice Export Corporation of Pakistan controlled all rice exports from Pakistan. Millers did not have direct access to export markets and could not set their own prices.[545] Then in 1988, Pakistan replaced the government-led Rice Export Corporation of Pakistan with the private-led Rice Exporters Association of Pakistan.[546] After the Rice Export Corporation was dismantled, the market has been mostly privately operated.[547] However, the government of Pakistan occasionally uses some forms of trade restrictions, typically a minimum export price (MEP). For example, in 2023, the government of Pakistan set MEPs for all types of rice. These ranged from $450 per mt for 100 percent broken rice to $900 per mt for super

[537] Government of Pakistan, API, *Rice Paddy Policy Analysis for 2022–23 Crop*, July 2022, 10; USDA, FAS, *Grain and Feed Annual: Pakistan*, April 23, 2020, 10.

[538] Business Recorder (Web Desk), "An Interview with Shahjahan Malik, Chairman Rice Exporters Association of Pakistan (REAP)," February 2, 2022. Industry experts, interview by USITC staff, August 19, 2024; S&P Global, GTAS database, Exports, HS Heading 1006, accessed various dates.

[539] The World Economic Commission surveys business executives to obtain their opinions on the quality of road and port infrastructure in their respective countries. World Economic Forum, *WEF Travel and Tourism Development Index 2024*, Interactive Data and Economy Profiles, accessed January 6, 2025.

[540] The World Bank's Logistics Performance Index does not provide and overall ranking for Pakistan in its latest report from 2023; however, the index reports import and export consolidated dwell times and port dwell times. World Bank, "Logistics Performance Index," accessed November 6, 2024, 46 and 50.

[541] *Times of India*, "Pakistan's Gwadar Port Exposes China's Belt and Road Failure," May 14, 2024.

[542] *Times of India*, "Pakistan's Gwadar Port Exposes China's Belt and Road Failure," May 14, 2024.

[543] USDA, FAS, *Grain and Feed Annual: Pakistan*, April 23, 2020, 9.

[544] USDA, FAS, *Grain and Feed Annual: Pakistan*, April 1, 2024, 10.

[545] USDA, FAS, *Grain and Feed Annual: Pakistan*, April 16, 2010.

[546] REAP, "About REAP," accessed April 12, 2024.

[547] USITC, hearing transcript, April 30, 2024, 8 (testimony of Ahsan Ali Mangi, Additional Secretary, Ministry of Commerce, Pakistan); USITC, hearing transcript, April 30, 2024, 40 (testimony of Ali Narang, Rice Exporters Association of Pakistan); REAP, "About REAP," accessed April 12, 2024; USDA, FAS, *Grain and Feed Annual: Pakistan*, April 16, 2010, 8.

basmati rice.[548] The Pakistani government lifted these export restrictions in September 2024, at the request of the Rice Exporters Association of Pakistan.[549]

In addition to the MEP placed on basmati rice, the government of Pakistan provides non-product-specific support to all crops. These programs lowered farm-level production costs through access to canal water, reduced electrical rates or solar power for tubewells, and subsidized fertilizer production.[550] The government also has programs to subsidize mechanization by providing farmers with tractors at a reduced cost. For example, the Green Tractor Scheme of the Punjab government offers subsidized prices for tractors that are manufactured in Pakistan.[551] Current industry observers noted, however, that in some cases subsidy amounts for tractor programs had been reduced or in others, repealed.[552] Additional programs focused on supplying farmers with mechanization equipment that is more specific to rice cultivation, such as transplanters and seed drills.[553] Following flooding in 2022, the government provided flood relief through various general agricultural programs called the Kissan Package, which funded agricultural loans, provided tractor subsidies, increased credit amounts, reduced fertilizer prices, and subsidized imported urea.[554] Finally, government entities provide services to rice exporters.[555] For example, the Trade and Development Authority promotes Pakistani rice exports at exhibitions and during trade negotiations. In addition, the Department of Plant Protection works with the entire supply chain to register stakeholders, adhere to phytosanitary protocols, and meet export requirements.[556]

Factors Affecting Competitiveness

Pakistan's position as a major global exporter of rice during 2018–23 was supported by its low delivered cost, product differentiation, and role as a reliable supplier of the product. Pakistan's cost of non-basmati rice production was lower than rice production in India. Production costs for all types of rice from Pakistan were aided by government programs for agriculture, and rice prices were made more

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548 During 2023, according to the FAO rice price index, the price of Pakistani basmati rice was $1,204 per metric ton. While this suggests that the minimum export price was well below the market price during 2023, these prices are not directly comparable because the FAO price quote reflects international prices. Government of Pakistan, TDAP, "Notification: The Ministry of Commerce has Fixed," November 7, 2023; Hussain, "Rice Battle Heats up as India, Pakistan Revise Export Policies," accessed October 23, 2024; FAO, "FAO Rice Price Update," accessed September 5, 2024.

549 Government of Pakistan, TDAP, "Notification: The Ministry of Commerce has Directed," September 27, 2024; Hussain, "Rice Battle Heats up as India, Pakistan Revise Export Policies," accessed October 23, 2024.

550 U.S. government official, interview by USITC staff, August 19, 2024.

551 Government of Punjab, "CM Green Tractor Scheme," accessed November 22, 2024.

552 U.S. government official, interview by USITC staff, August 19, 2024; Government of Pakistan, MOF, "Federal Minister for Finance and Revenue," November 14, 2022. t

553 Punjab Extension and Adaptive Research, "National Program for Enhancing Profitability through Increasing Productivity of Rice," accessed October 8, 2024; PERI, *Mid-Term Evaluation of National Programme for Enhancing Profitability through Increasing Productivity*, 2022.

554 State Bank of Pakistan, AC & MFD Circular No. 04 of 2022, Markup Subsidy and Risk Sharing Scheme for Farm Mechanization ("Kissan Package"), Dec. 21, 2022; Government of Pakistan, Economic Advisor's Wing (Finance Division), *Pakistan Economic Survey 2022–23, Chapter 2: Agriculture*, June 8, 2023, 24.

555 USITC, hearing transcript, April 30, 2024, 8 (testimony of Ahsan Ali Mangi, Additional Secretary, Ministry of Commerce, Pakistan).

556 USITC, hearing transcript, April 30, 2024, 8 (testimony of Ahsan Ali Mangi, Additional Secretary, Ministry of Commerce, Pakistan).

attractive by exchange rate effects. However, infrastructure issues, port delays, and freight costs increased export prices. Since 2020, India was generally priced lower than Pakistan for exports of 5 percent broken, long grain rice, but Pakistan was more often priced lower than other competitors.[557] Pakistan also benefits from being one of just two global suppliers of basmati rice, a premium product that is naturally differentiated from other types of rice. Pakistan increased basmati exports to the United States between 2018 and 2023, but Pakistan's exports of branded basmati products were minimal. For all rice, Pakistan's export reliability was strong because the country's production volume was high and domestic consumption was low. In addition, the government of Pakistan limited trade restrictions to the use of minimum export prices and actively promoted rice exports.

Low Delivered Cost Bolstered by Government Policies

A major factor that allows Pakistan to remain competitive in global rice markets is low delivered cost, based largely on farm-level cost of production. Pakistan fell into a grouping of low-cost rice producers along with India and Vietnam (chapter 3, "Costs of Production on Rice Farms"). During MY 2022/23, production costs for non-basmati rice in Pakistan ranged from $124 to $147 per mt, with the cost of labor between $52 and $55 per mt.[558] As noted in "Industry Structure," widespread use of family labor as well as low cost hired labor kept labor costs low in Pakistan. Also contributing to low production costs are the government policies described above that support agricultural production and exports. For example, Pakistan provides low-cost fertilizer both directly—by supplying fertilizer to rice farmers—and indirectly, by providing electrical and natural gas subsidies to its fertilizer industry. This was particularly helpful to its rice producers when fertilizer costs soared in 2022.[559] In particular, the Kissan Package reduced diammonium phosphate per-bag fertilizer costs by 18 percent.[560] In addition, the government has worked alongside the private sector to develop and supply hybrid seed to rice producers, which have reportedly greatly improved rice production.[561]

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[557] USDA, FAS, *Rice Export Prices Highest in More Than a Decade as India Restricts Trade*, September 19, 2023; IGC, "All Rice Prices," accessed various dates.

[558] The latest available production cost data for India are from MY 2021/21. That year, production costs for all rice the top four rice-producing states in India (Punjab, Telangana, Uttar Pradesh, and West Bengal) were between $190 and $272 per mt (including labor costs of $32 to $92 per mt) in MY 2021/22. India's cost of production included basmati production and did not differentiate by rice type. Production costs for basmati and non-basmati rice in the top two rice-producing states in Pakistan (Punjab and Sindh) ranged from $142 to $253 per mt, with the cost of labor between $49 and $82 per mt. Additional details are provided in the "Cost of Production" section of chapter 3. Government of Pakistan, API, *Rice Paddy Policy Analysis for 2022–23 Crop*, July 2022, 11 and 33-34.

[559] U.S. government official, interview by USITC staff, August 19, 2024; Paulson et al., "How Historic Were Fertilizer Prices in 2022?," September 12, 2023, 2–3; Government of Pakistan, *Pakistan Economic Survey 2022–23, Chapter 2: Agriculture*, June 8, 2023, 24–25.

[560] Government of Pakistan, Economic Advisor's Wing, *Pakistan Economic Survey 2022–23, Chapter 2: Agriculture*, June 8, 2023, 24.

[561] Business Recorder (Web Desk), "An Interview with Shahjahan Malik, Chairman Rice Exporters Association of Pakistan (REAP)," February 2, 2022; USDA, FAS, *Grain and Feed Annual: Pakistan*, April 1, 2024, 7; USITC, hearing transcript, April 30, 2024, 7–8 (testimony of Ahsan Ali Mangi, additional Secretary, Ministry of Commerce).

During 2018–23, exchange rate movements also supported the price competitiveness of Pakistani rice internationally. Specifically, the devaluation of the rupee relative to the dollar over the period made Pakistan's prices more attractive to buyers in the global market.[562]

Offsetting the low cost of operations at the farm level are higher marketing and transportation costs, associated with poor road and port quality, port delays, and high freight costs.[563] A lack of empty containers at Pakistan's Karachi port contributed to higher shipping charges for the rice industry, specifically in 2022.[564] Pakistan is also a major supplier to Africa and the EU; thus, the Houthi-led attacks in the Red Sea increased delivered costs for Pakistan because detours from shipping routes were longer to reach some of these markets.[565] In addition, Pakistan (like other global suppliers) faced demurrage charges from shipping lines when entering the Red Sea.[566] According to sources in Pakistan, its exports, particularly to the Middle East, EU, and the United States, would have grown faster if not for the Red Sea disruption.[567]

Basmati Product Differentiation

During 2018–23, Pakistan was the world's number two supplier of basmati rice after India.[568] As global demand for basmati has increased, so has Pakistan's market share in places like the United States.[569] U.S. imports of basmati rice from Pakistan increased 26 percent from 16,635 mt in 2021 to 21,034 mt in 2023.[570] Still, India had the largest market share and lowest average price (based on import average unit values) for basmati in the United States during these years.[571] Most basmati rice from Pakistan was exported directly from mills and sold in bulk, and there was minimal branded, packaged rice.[572] One source noted reasons for a lack of brand development for rice in Pakistan, such as exporters' desire for quick returns on investments and sizeable demand for bulk product from the Middle East.[573] During 2018

[562] USDA, FAS, *Grain and Feed Annual: Pakistan*, March 22, 2022, 8.
[563] World Economic Forum, *WEF Travel and Tourism Development Index 2024*, Interactive Data and Economy Profiles, May 2024; World Bank, "Logistics Performance Index," accessed November 6, 2024, 46 and 50.
[563] USDA, FAS, *Grain and Feed Annual: Pakistan*, March 22, 2022, 8.
[564] Arab News, "Rice Exporters Say High Freight Charges May Cost Pakistan," January 11, 2022.
[565] John, "Pakistani Rice Market Set for Bullish 2024," January 3, 2024.
[566] Demurrage charges are imposed by a shipping line to the consignee if the shipping container is not returned to a designated depot by the specified time. Crowley Logistics, "What Is Demurrage?," August 6, 2019; Siddiqui, Salman, "Freight Charges Skyrocket 150% In Pakistan," January 31, 2024.
[567] Savage and Jilani, "Pakistan Rice Exports Hit Record," June 16, 2024.
[568] USITC, hearing transcript, April 30, 2024, 7 (testimony of Ahsan Ali Mangi, Additional Secretary, Ministry of Commerce, Pakistan).
[569] S&P Global, General imports, HTS statistical reporting number 1006.30.10.20, basmati rice, accessed various dates; USITC, hearing transcript, April 30, 2024, 7 (testimony of Ahsan Ali Mangi, Additional Secretary, Ministry of Commerce, Pakistan).
[570] As described in chapter 9, 2021 was the first full year for which U.S. import data for basmati rice were available. S&P Global, General imports, HTS statistical reporting number 1006.30.10.20, basmati rice, accessed various dates.
[571] S S&P Global, General imports, HTS statistical reporting number 1006.30.10.20, basmati rice, accessed various dates.
[572] USDA, FAS, *Grain and Feed Annual: Pakistan*, April 23, 2020, 10.
[573] Business Recorder (Web Desk), "An Interview with Shahjahan Malik, Chairman Rice Exporters Association of Pakistan (REAP)," February 2, 2022; USITC, hearing transcript, April 30, 2024, 8 (testimony of Ahsan Ali Mangi, Additional Secretary, Ministry of Commerce, Pakistan).

to 2023, there was also a market in the EU for bulk brown basmati rice.[574] Despite basmati rice's popularity in export markets, Pakistan's basmati producers faced production challenges. These challenges stemmed mostly from the lack of newer hybrid basmati varieties to overcome temperature, disease, and pest pressures.[575]

Reliable Export Surplus and Focus on Export Growth

Pakistan's low levels of rice consumption, high levels of rice production, and government commitment to avoid export restrictions created a reliability of supply advantage in 2018–23. During the period, rice's profitability compared to cotton (another major crop in the country) increased, cotton production challenges increased, and global rice export prices increased, thus increasing rice area harvested.[576] Yields were also bolstered by the uptake of newly available hybrid varieties.[577] Without government-imposed export bans or tariffs, Pakistan's exporters shipped consistent volumes of rice even during disruptions.[578] For example, despite the onset of a global pandemic in 2020 and extreme flooding in MY 2022/23, Pakistan's export quantities did not deviate much from the six-year average of 4.3 million mt.[579] In 2020, exports dropped only 6.6 percent below the six-year average, and in 2023, exports were 6.8 percent above the six-year average.[580] Although the PSD data (table 5.6) show a dip in exports in MY 2022/23 because of the floods, the consistency of export levels on a calendar year basis (table 5.7) suggests that Pakistan's exports recovered quickly.

The rice industry and economists noted the importance of rice exports as a source of foreign currency for the government, which bolstered private industry's relationship with the government.[581] Rice exports were supported by export promotion programs via the Trade and Development Authority of Pakistan, which expanded market opportunities beyond its typical trade partners, for example to Malaysia.[582] Broadly, the government has set a target of expanding rice exports by 150 percent (from about $4 billion in MY 2023/24 to $10 billion) by 2030.[583]

[574] S&P Global, Total exports, HS heading 1006, rice, accessed various dates; USDA, FAS, *Grain and Feed Annual: Pakistan*, April 1, 2024, 9.
[575] Industry experts, interview by USITC staff, November 21, 2024; USDA, FAS, *Grain and Feed Annual: Pakistan*, April 1, 2024, 7.
[576] IGC, "All Rice Prices," accessed various dates; MNFSR, "*Year Book 2022–23*," November 2023, 198; API, *Rice Paddy Policy Analysis for 2022-23 Crop*, July 2022, 15; USDA, FAS, *Grain and Feed Annual: Pakistan*, June 24, 2021, 9.
[577] Business Recorder (Web Desk), "An Interview with Shahjahan Malik, Chairman Rice Exporters Association of Pakistan (REAP)," February 7, 2022; USITC, hearing transcript, April 30, 2024, 6–8 (testimony of Ahsan Ali Mangi, Additional Secretary, Ministry of Commerce, Pakistan).
[578] Staff calculations. S&P Global, Total exports, HS heading 1006, rice, accessed various dates; USITC, hearing transcript, April 30, 2024, 39 (testimony of Ali Narang, Rice Exporters Association of Pakistan).
[579] Staff calculations. S&P Global, Total exports, HS heading 1006, rice, accessed various dates.
[580] Staff calculations. S&P Global, Total exports, HS heading 1006, rice, accessed various dates.
[581] USITC, hearing transcript, April 30, 2024, 10 (testimony of Ali Narang, Rice Exporters Association of Pakistan); Irshad, Xin, and Arshad, "Competitiveness of Pakistani Rice in International Market," January 1, 2018, 1; USDA, FAS, *Grain and Feed Annual: Pakistan*, March 22, 2022, 8.
[582] USITC, hearing transcript, April 30, 2024, 8–9 (testimony of Ahsan Ali Mangi, additional Secretary, Ministry of Commerce).
[583] Zamir, "Interview: Pakistan's Ambitious Rice Export Goals," December 20, 2024.

India's trade restrictions that started in September 2022 and were mostly removed by October 2024 (except the ban on broken rice) further increased Pakistan's export market share in certain destinations. After July 2023, when India's export restrictions were fully in place, and continuing into 2024, Pakistan realized increased orders from India's former buyers, which drove a rapid increase in exports.[584] On a marketing year basis, Pakistan's exports in MY 2023/24 were 54 percent higher than the average of the previous 5 years, as shown in table 5.6. Throughout 2018–23, both India and Pakistan exported basmati to the Middle East, the EU and the United States and parboiled, broken and long grain white rice to sub-Saharan Africa and Asia.[585] It was in these latter markets, for long grain white rice, where Pakistan made most of its gains while India's restrictions were in place. For example, India's trade policies led to expanded market share for Pakistan's rice in Senegal, where India was the primary supplier of rice.[586] Monthly trade data show that by November 2023, three months after India banned non-basmati rice exports, exports from Pakistan to Senegal, Côte d'Ivoire, and Togo had increased over 200 percent year over year. These three markets are all common export destinations for India and Pakistan.[587] After gaining a greater presence in these markets, there is an opportunity for Pakistan to maintain its share going forward, although it will reportedly face price competition from India.[588]

Bangladesh

Bangladesh is a major rice producer and is almost entirely self-sufficient. Bangladesh is an occasional importer of white and aromatic rice when necessary to cover production shortfalls. It exports only minimal amounts of aromatic rice varieties and seeds to a few markets. Rice is the staple grain in Bangladesh, with about two-thirds of daily calories coming from rice consumption. Rice production is an integral part of the Bangladeshi economy. In 2023, the agricultural sector accounted for about 12 percent of total gross domestic product (GDP); on average, rice contributes about 70 percent of agricultural GDP.[589]

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[584] USDA, FAS, *Grain and Feed Annual: Pakistan*, April 1, 2024, 2 and 8.
[585] S&P Global, Total exports, India subheading 1006.30.20, basmati, accessed various dates; S&P Global, Total exports, India subheading 1006.30.10, parboiled white rice, accessed various dates; S&P Global, Total exports, India subheading 1006.30.90, non-basmati white rice, accessed various dates; S&P Global, Total exports, HS subheading 1006.10, rice in the husk (paddy or rough), accessed various dates; S&P Global, Total exports, HS subheading 1006.20, brown rice, accessed various dates; S&P Global, Total exports, HS subheading 1006.40, broken rice, accessed various dates; REAP, "Exports," accessed July 30, 2024.
[586] Baloni, "Pakistan's 2025 Rice Export Landscape Likely to Change," December 31, 2024.
[587] S&P Global, Total exports, HS heading 1006, rice, accessed various dates.
[588] USITC, hearing transcript, April 30, 2024, 8–9 (testimony of Ahsan Ali Mangi, additional Secretary, Ministry of Commerce); S&P Global, Total exports, HS heading 1006, rice, accessed various dates; Baloni, "Pakistan's 2025 Rice Export Landscape Likely to Change," December 31, 2024.
[589] BBS, SID, *Yearbook of Agricultural Statistics: 2023*, June 2024, 3; Saha et al., "Rice Quality and Its Impacts on Food Security," December 31, 2021, 2.

Production

Bangladesh is the third-largest producer of rice in the world, accounting for about 7 percent of global production.[590] Bangladesh produces both aromatic and nonaromatic long and medium grain varieties.[591] About 17 percent of production is composed of hybrid varieties. High-yield and hybrid varieties are developed by the private sector along with IRRI and the Bangladesh Rice Research Institute (BRRI).[592] Bangladesh typically produces 1.8–1.9 million mt of aromatic rice annually, which is about 5 percent of total production.[593] Total production of milled rice increased 6.0 percent from 34.9 million mt in MY 2018/19 to 37.0 million mt in MY 2023/24 (table 5.8). Yields similarly saw a 4.4 percent increase between MY 2018/19 and MY 2023/24. The area harvested was stable over the period, ranging between 11.5 million and 11.8 million hectares.

Table 5.8 Bangladesh: rice production, consumption, stocks, and trade, marketing years 2018/19–2023/24

In metric tons (mt), hectares (ha), kilograms (kg), metric tons per hectare (mt/ha), and percentages (%), by marketing year. ** = rounds to 0.

Attribute	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
Beginning stocks (1,000 mt)	1,500	1,405	1,571	1,458	2,091	2,409
Production (milled) (1,000 mt)	34,909	35,850	34,600	35,850	36,350	37,000
Area harvested (1,000 ha)	11,770	11,830	11,500	11,620	11,600	11,750
Yield (rough) (mt/ha)	4.5	4.6	4.5	4.6	4.7	4.7
Imports (1,000 mt)	400	20	1,400	1,300	1,275	25
Consumption and residual (1,000 mt)	35,400	35,700	36,100	36,500	37,300	37,600
Exports (1,000 mt)	4	4	13	17	7	6
Ending stocks (1,000 mt)	1,405	1,571	1,458	2,091	2,409	1,828
Exports-to-production ratio (%)	**	**	**	**	**	**
Ending stocks-to-use ratio (%)	4.0	4.4	4.0	5.7	6.5	4.9
Per capita consumption (kg)	227.0	218.1	218.1	218.0	220.2	219.6

Source: USDA, FAS, PSD Online database, accessed September 13, 2024; World Bank, Data: Population, accessed September 13, 2024.
Note: Per capita consumption was calculated using marketing year apparent consumption divided by calendar year population. All other data, including imports and exports, are based on the marketing year.

Rice production occurs in every district across the country and across three planting seasons.[594] Although rice production occurs year-round, most production (54 percent) takes place during the winter, post-monsoon *Boro* season from November through May.[595] The monsoon *Aman* season that runs from June

[590] USDA, FAS, PSD Online database, accessed various dates.
[591] Domestic aromatic varieties include BRRI dhan 34, which is the most produced aromatic variety, followed by indigenous varieties chinigura and kalijira. BRRI dhan 11, 22, 48, and 75 are known as mega-varieties and are the most produced nonaromatic varieties. Industry representative, interview by USITC staff, October 29, 2024; industry representative, interview by USITC staff, October 30, 2024.
[592] Industry representative, interview by USITC staff, October 29, 2024; industry representative, interview by USITC staff, October 30, 2024; BBS, SID, *Yearbook of Agricultural Statistics: 2023*, June 2024, 51; Saha et al., "Rice Quality and Its Impacts on Food Security," December 31, 2021, 3.
[593] Karim and Wardad, "Aromatic Rice Exporters Suffer Blow as Govt 'abruptly' Bans Export," October 26, 2023; USDA, FAS, PSD Online database, "Rice Production, All Countries, 2024," accessed various dates.
[594] USDA, FAS, IPAD, "Bangladesh Rice Area, Yield and Production," August 12, 2024.
[595] USDA, FAS, IPAD, "Bangladesh Rice Area, Yield and Production," August 12, 2024.

through December makes up 39 percent of production, and the shorter pre-monsoon *Aus* season, from March through August, accounts for the remaining production.[596]

Consumption and Stocks

Rice is a staple for consumers in Bangladesh, reflected in its high per capita consumption. Rice accounts for about 63 percent of daily caloric intake.[597] Total consumption grew 6.2 percent from 35.4 million mt in MY 2018/19 to 37.6 million mt in MY 2023/24. Per capita consumption decreased from 227.0 kg/year in MY 2018/19 to 219.6 kg/year in MY 2023/24.[598] Most rice consumed is parboiled, though some regions prefer non-parboiled white rice. Two forms of parboiled rice are consumed in Bangladesh: double-boiled—for which the rice is steamed, soaked, and steamed again before drying; and single-boiled rice, which is prepared the conventional way of soaking followed by steaming before drying.[599] Aromatic rice is a luxury good, typically consumed on special occasions. Evidence suggests that consumption of aromatic rice increases as disposable income rises.[600] Generally, Bangladeshi consumers look for rice that cooks firm and dry and prioritize taste, slenderness, whiteness, grain length, and aroma when determining quality.[601]

Ending stocks, consisting of both public and private holdings, increased slightly from 1.4 million mt in MY 2018/19 to 1.8 million mt in MY 2023/24. Ending stocks peaked at 2.4 million mt in MY 2022/23. Stocks-to-use ratios throughout the period were low compared with other major rice-producing countries, indicating a tight rice supply in Bangladesh. Despite self-sufficiency goals, demand for rice regularly exceeds production, necessitating imports. Changes in imports seem to correspond with changes in both production and ending stocks. In MY 2023/24, the year following the peak in stocks, imports dropped from 1.27 million mt to 25,000 mt.

Trade

Bangladesh is a net importer of rice. From 2018 to 2023, imports were erratic, ranging from 21,700 mt to 2.6 million mt (table 5.9). The Bangladeshi government and private firms import rice to cover domestic production shortfalls.[602] The largest import sources in 2023 were India, which supplied 64.9 percent of imports, and Thailand, which supplied 34.8 percent of imports. Despite the volatility of import volumes

[596] USDA, FAS, IPAD, "Bangladesh Rice Area, Yield and Production," August 12, 2024.
[597] UN, FAO, FAOSTAT, "Food Balances," accessed various dates.
[598] Official statistics from the government of Bangladesh have per capita consumption in 2022 at 328.9 g/day or 120.0 kg/year. These data are collected every five to six years via the Household Income and Expenditure Survey and are presented on a calendar-year basis. BBS, SID, *Statistical Yearbook Bangladesh 2022*, June 2023, 500.
[599] Saha et al., "Rice Quality and Its Impacts on Food Security," December 31, 2021, 3.
[600] Kashem and Ali, "Govt Bans Aromatic Rice Export to Control Price," June 30, 2022; Kabir, Jahan, and Das, "Yield Performance of Three Aromatic Fine Rices," accessed September 18, 2024, 561.
[601] Saha et al., "Rice Quality and Its Impacts on Food Security," December 31, 2021, 3.
[602] USDA, FAS, *Grain and Feed Update: Bangladesh*, August 27, 2024, 7–8; The Daily Star, "Bangladesh Govt Reduces Import Tariff on Rice," February 9, 2024; Byron and Abbas, "Govt Decides to Lift Duties on Rice Imports," November 1, 2024.

from 2018 to 2023, some reports indicate that the demand for imported rice is declining.[603] Most imported rice was parboiled, with some specialty aromatic rice imported as well.[604]

Table 5.9 Bangladesh: imports of rice, by major market, 2018–23
In thousands of metric tons. ** = rounds to zero.

Trade partner	2018	2019	2020	2021	2022	2023
India	1,068.1	63.4	17.4	2,513.0	656.7	215.1
Thailand	75.9	0.1	**	**	82.2	115.3
Pakistan	20.5	2.3	0.9	1.2	1.3	0.6
China	1.2	0.9	2.8	0.5	0.6	0.5
Vietnam	10.1	5.3	0.7	53.3	31.4	0.0
United States	0.0	0.0	0.0	0.7	0.0	0.0
All others	0.5	**	**	0.7	0.1	**
Total	1,176.3	71.9	21.7	2,568.8	772.2	331.6

Source: S&P Global, Total exports, HS heading 1006, rice, accessed August 19, 2024.
Note: Import data were calculated by aggregating exports to Bangladesh as reported by all other countries.

Exports were significantly smaller than imports at 8,400 mt in 2018, peaking at 13,500 mt in 2020 before dropping to 5,900 mt in 2023 (table 5.10). The largest destination was the United States, which received 35.6 percent of Bangladesh's rice exports in 2023. Exports were primarily seed and aromatic rice and specialty varieties destined for diaspora populations.[605] The Bangladeshi government often restricts exports of both aromatic and nonaromatic rice because of food security concerns.[606]

Table 5.10 Bangladesh: exports of rice, by major market, 2018–23
In thousands of metric tons.

Trade partner	2018	2019	2020	2021	2022	2023
United States	1.9	1.7	2.5	2.0	1.8	2.1
Canada	0.3	0.3	0.5	0.4	0.4	0.7
Italy	1.1	0.7	0.9	0.7	0.8	0.6
United Kingdom	0.2	0.3	0.5	0.4	0.4	0.5
Singapore	0.2	0.2	0.2	0.3	0.3	0.4
Australia	0.3	0.4	0.6	0.4	0.3	0.3
Qatar	0.2	0.1	0.2	0.4	0.2	0.2
Jordan	0.3	0.2	0.2	0.3	0.1	0.2
Malaysia	0.6	1.0	1.0	1.0	0.4	0.2
Maldives	0.1	0.1	0.1	0.1	0.1	0.1
All others	3.2	4.3	6.8	6.0	8.4	0.6
Total	8.4	9.2	13.5	12.2	13.2	5.9

Source: S&P Global, General imports, HS heading 1006, rice, accessed August 19, 2024.
Note: Export data were calculated by aggregating imports from Bangladesh as reported by all other countries.

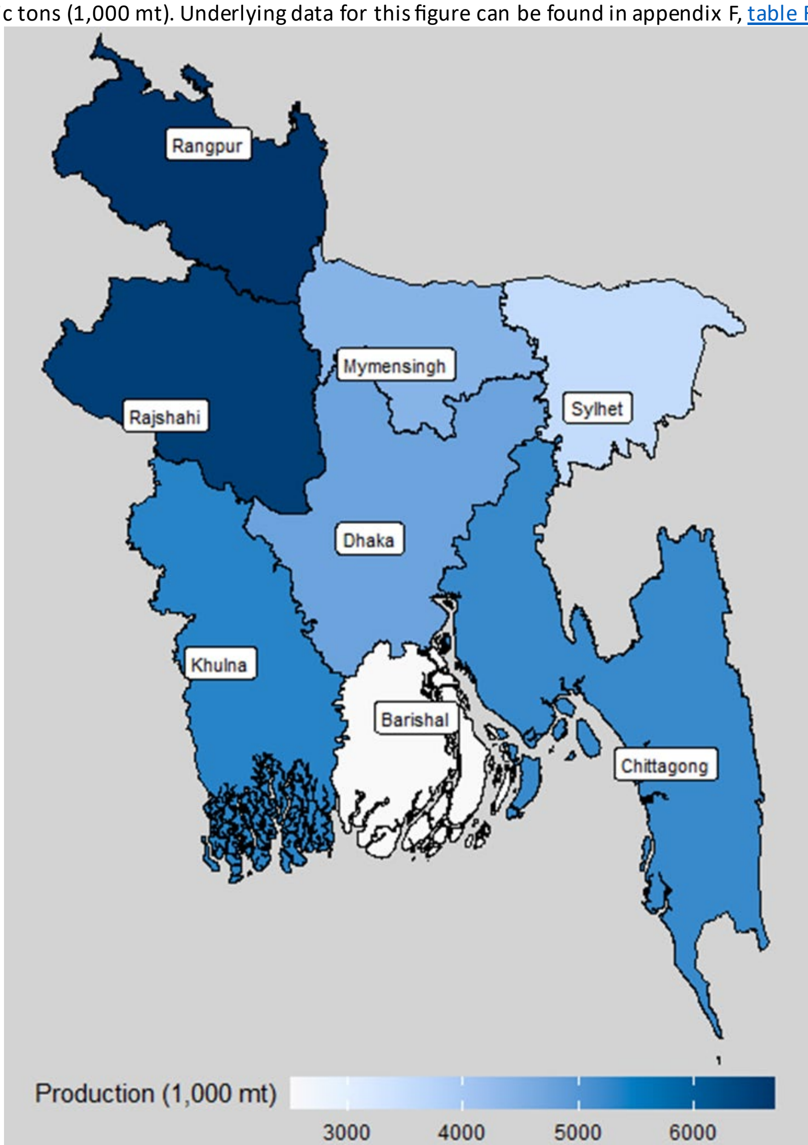
[603] USDA, FAS, *Grain and Feed Update: Bangladesh*, December 21, 2023, 6–7.
[604] Industry representative, interview by USITC staff, October 29, 2024; industry representative, interview by USITC staff, October 30, 2024; Arvin Donley, "Bangladesh Forecast to Increase Rice Imports," August 25, 2023.
[605] Industry representative, interview by USITC staff, October 29, 2024; industry representative, interview by USITC staff, October 30, 2024; Karim and Wardad, "Aromatic Rice Exporters Suffer Blow as Govt 'abruptly' Bans Export," October 26, 2023; USDA, FAS, *Grain and Feed Annual: Bangladesh*, April 5, 2022, 6.
[606] USDA, FAS, *Grain and Feed Update: Bangladesh*, December 21, 2023, 8; Karim and Wardad, "Aromatic Rice Exporters Suffer Blow as Govt 'abruptly' Bans Export," October 26, 2023.

Industry Structure

Rice production occurs across all eight divisions of Bangladesh (figure 5.7). While the largest producing divisions vary between seasons, production was relatively evenly distributed across the country, ranging from Barishal (6.4 percent of total production) to Rangpur (17.2 percent) in MY 2022/23.

Figure 5.6 Bangladesh: rice production by division, marketing year 2022/23

In thousands of metric tons (1,000 mt). Underlying data for this figure can be found in appendix F, table F.19.



Source: Bangladesh Bureau of Statistics, *Bangladesh Agricultural Yearbook: 2023*, June 2024.

Rice production in Bangladesh generally takes place on small family farms and is an important source of rural income. Bangladesh has approximately 16.9 million farm holdings, most of which are less than one hectare.[607] Over two-thirds of the population lives in rural areas, and the rice industry in Bangladesh is the primary income source for about half the rural population.[608] However, since the 1990s, significant migration of rural labor to cities has occurred, particularly among unskilled workers who do not own land, resulting in labor scarcity in rural areas. This scarcity led to increasing labor costs and delayed planting and harvesting, as well as dependence on family labor.[609]

Rice production in Bangladesh is labor intensive, particularly during planting and harvesting. This is largely because, despite some progress in machinery adoption in some regions, overall mechanization in Bangladesh is relatively low compared to other rice-producing countries.[610] About 60 percent of rice farming takes place on irrigated land.[611] Planting, harvesting, fertilizer application, and weeding are primarily done by hand, although land preparation, irrigation, threshing, and pesticide application are mechanized on some farms.[612] Reportedly, the lack of capital available to farmers, along with the limited domestic production of agricultural machinery, limits the potential for further mechanization of rice production.[613]

Inefficiencies in the use of inputs, as well as recent high prices for these inputs (including fertilizers, herbicides, pesticides, irrigation, and seeds), further limit the productivity of Bangladesh's rice industry. Reportedly, despite subsidies from the national government, the recent sharp increases in the costs of all inputs limited farmers' profits.[614] Difficulties with the seed procurement system reportedly discouraged farmers from using certified seeds sold via formal channels. Farmers instead relied on informal seed purchases, which led to the use of low-quality, counterfeit, and mishandled seeds. Lack of farmer participation in the formal seed market undermined government efforts to use new varieties to increase yields.[615]

Difficult growing conditions in Bangladesh also limit the productivity of the industry at times. Diseases such as leaf blasts, stem rot, and rice tungro disease impact rice production year-round.[616] Rice producers also reportedly face issues with soil fertility, as intensive agriculture and low fertilizer use

[607] BBS, SID, *Yearbook of Agricultural Statistics: 2023*, June 2024, 521; industry expert, email message to USITC staff, April 23, 2024; Sayeed and Yunus, *Rice Prices and Growth, and Poverty Reduction in Bangladesh*, 2018, 3; Gautam and Ahmed, *Too Small to Be Beautiful?*, March 2018, 6.
[608] Saha et al., "Rice Quality and Its Impacts on Food Security and Sustainability in Bangladesh," December 31, 2021, 2; Sayeed and Yunus, *Rice Prices and Growth, and Poverty Reduction in Bangladesh*, 2018, 3.
[609] Robin, "Full-Scale Farm Mechanisation in Bangladesh," August 2, 2023; USAID, "Twice the Rice," October 3, 2023.
[610] Robin, "Full-Scale Farm Mechanisation in Bangladesh," August 2, 2023; ADB, *Bangladesh's Agriculture, Natural Resources, and Rural Development Sector Assessment and Strategy*, March 2023, 15.
[611] BBS, SID, *Yearbook of Agricultural Statistics: 2023*, June 2024, 51, 514; IRRI, "GHG Mitigation in Rice - Bangladesh," accessed November 1, 2024.
[612] Robin, "Full-Scale Farm Mechanisation in Bangladesh," August 2, 2023.
[613] Robin, "Full-Scale Farm Mechanisation in Bangladesh," August 2, 2023; ADB, *Bangladesh's Agriculture, Natural Resources, and Rural Development Sector Assessment and Strategy*, March 2023, 15.
[614] Industry expert, email message to USITC staff, April 23, 2024; Parvez, "Bangladesh's Rice Acreage, Production to Drop," August 27, 2023; Sayeed and Yunus, *Rice Prices and Growth, and Poverty Reduction in Bangladesh*, 2018, 9; Patrick, "Bangladesh's Rice Policy Paradox," September 22, 2021.
[615] IRRI, "Bangladeshi Rice Farmers' Preferences Can Help Guide Future Design and Implementation of Seed Initiatives for Agricultural Development," September 9, 2024.
[616] Parvin, "Prevention Is Best Defense against Bangladesh Crop Diseases, Researchers Say," January 15, 2024.

degrade soil quality.[617] Further exacerbating soil fertility and pest issues are low-quality and counterfeit chemical inputs.[618] Producers also face climate-related disasters that disrupt production. Extreme weather, including shifting rainfall patterns, flooding, and more extreme storms are causing crop losses and impacting yields.[619] Too little water can lead to crop stress and reduced yields, while too much rain can cause planting delays, damage, and total loss. Coastal growing regions are also facing saltwater intrusion and brackish groundwater. Finally, extreme heat is an additional challenge producers face, because temperatures outside the 20–30 degrees Celsius (68–86 degrees Fahrenheit) range can stress rice plants.[620]

After leaving the farm, Bangladeshi rice enters a supply chain that is long, complex, and hampered by inaccurate data collection and alleged hoarding and siphoning of rice by industry participants.[621] Two distinct supply chains for rice exist: public and private. The public (government procurement) system operates to support lower-income households (described below in “Government Programs”). Millers cater to both the government procurement and private sector supply chains. Millers purchase paddy rice via commission agents and wholesalers during harvest seasons and hold stocks for processing year-round.[622] In the private sector, wholesale aggregators purchase rice from mills and distribute to specialized rice retailers who sell rice—either loose or in sealed, prepacked bags—to consumers in open markets. The private market is further segmented by type of rice, often distinguished by region.[623] Poor physical infrastructure—particularly roads, trucking fleets, reliable electricity, and storage facilities—lead to postharvest losses, though the government has made investments in supply chain infrastructure in recent years.[624]

About 60 percent of rice produced in Bangladesh is sold to paddy traders for marketing to the milling sector, which comprises approximately 17,000 mills. The remaining 40 percent is processed on-farm for consumption using homemade tools, along with some small-scale custom mills.[625] Total milling capacity has reportedly doubled from the late 1990s to 2018.[626] This increase is due to a shift from traditional

[617] Industry representative, interview by USITC staff, October 30, 2024; Sayeed and Yunus, *Rice Prices and Growth, and Poverty Reduction in Bangladesh*, 2018, 6–7; Siddique, “Degraded Soil Threatens to Exacerbate Bangladesh Food Crisis,” December 30, 2022.
[618] Sayeed and Yunus, *Rice Prices and Growth, and Poverty Reduction in Bangladesh*, 2018, 6–7.
[619] Industry representative, interview by USITC staff, October 30, 2024; USDA, FAS, *Grain and Feed Update: Bangladesh*, December 21, 2023, 3; Hossain, “As Rising ‘heat Shocks’ Ruin Rice Crops, Bangladesh Faces Hunger Risk,” May 28, 2021; Maniruzzaman et al., “Dry Season Rainfall Variability Is a Major Risk,” April 1, 2024.
[620] Rajan, “Boosting Rice Production In Bangladesh,” May 13, 2021; Montu, “Bangladesh Rice Farmers Invent New Varieties,” July 22, 2021; Hossain, “As Rising ‘heat Shocks’ Ruin Rice Crops, Bangladesh Faces Hunger Risk,” May 28, 2021; CIAT, World Bank, *Climate Smart Agriculture in Bangladesh*, 2017; Maniruzzaman et al., “Dry Season Rainfall Variability Is a Major Risk,” April 1, 2024.
[621] Kashem and Ali, “Despite Surplus Production, Why Is Bangladesh Still Importing Rice?,” February 11, 2024.
[622] CBECL Group, “The Rice Milling Sector in Bangladesh Is Undergoing a Change,” September 20, 2014.
[623] Saha et al., “Rice Quality and Its Impacts on Food Security and Sustainability in Bangladesh,” December 31, 2021, 3; Shwapan, “Rice Yield Rising Every Year in Barisal,” January 3, 2023.
[624] Industry expert, email message to USITC staff, April 23, 2024; Sayeed and Yunus, *Rice Prices and Growth, and Poverty Reduction in Bangladesh*, 2018, 16; ADB, *Bangladesh’s Agriculture, Natural Resources, and Rural Development Sector Assessment and Strategy*, March 2023, 16; Government of Bangladesh, LGRD, “Bangladesh Agricultural Infrastructure Development Program (BAIDP),” June 30, 2019.
[625] Saha et al., “Rice Quality and Its Impacts on Food Security and Sustainability in Bangladesh,” December 31, 2021, 2–3, 11.
[626] Sayeed and Yunus, *Rice Prices and Growth, and Poverty Reduction in Bangladesh*, 2018, 4.

husking mills to more advanced automated mills. Traditional husking mills produce a larger percentage of broken kernels than fully automated mills.[627] Automated rice mills service the urban market and can process the rice from beginning to bagging, including cleaning, parboiling, husking, whitening, grading, and polishing. Improved milling capacity is also reportedly due to incentivized purchasing from government procurement programs (described below in "Government Programs"), as well as increases in private sector investment spurred by consumer demand for the rice processed at automated mills and its by-products (such as bran used to produce cooking oil).[628] International organizations, such as the International Finance Corporation, have also invested in rice mill modernization in Bangladesh.[629]

Government Programs

The Bangladeshi government is highly engaged in the domestic rice industry. Food security through self-sufficiency in rice is a main driver influencing government policies in the sector.[630] In Bangladesh, according to one source, "food security means rice security."[631] Increases in food and energy prices due to global conflicts, as described in chapter 3, and the loss of major rice suppliers in the region due to trade restrictions have increased concerns about food security.[632]

The Bangladeshi government employs a public procurement and distribution program for rice through the Public Food Distribution System (PFDS).[633] The goal of the PFDS is to stabilize food prices, create food security for the impoverished portion of Bangladesh's population, and ensure a fair price for farmers.[634] Through the PFDS, the government sets a minimum procurement price for rice and procurement quantity targets based on prices and current stocks.[635] Procurement comes in the form of purchases of milled rice from domestic millers, as well as imports through government-to-government contracts to make up for domestic shortfalls.[636] The Bangladeshi government distributes more than 1 million mt of rice through various programs under the PFDS.[637] The combination of direct government procurement and distribution along with open market sales serves to stabilize rice prices.[638]

The Bangladeshi government has a long tradition of providing support for rice farmers. In addition to the minimum procurement price set by the government, farmers also receive support in the form of input

[627] Mehedi Hasan and Mitali Saha, "Rice Mill Industry of Bangladesh," February 2021; Sayeed and Yunus, *Rice Prices and Growth, and Poverty Reduction in Bangladesh*, 2018, 4.
[628] CBECL Group, "The Rice Milling Sector in Bangladesh Is Undergoing a Change," September 20, 2014; World Bank, IFC, "First Project Under IFC's Global Food Security Platform," May 22, 2023.
[629] World Bank, IFC, "First Project Under IFC's Global Food Security Platform," May 22, 2023.
[630] Sayeed and Yunus, *Rice Prices and Growth, and Poverty Reduction in Bangladesh*, 2018, 15–16.
[631] World Bank, IFC, "First Project Under IFC's Global Food Security Platform," May 22, 2023.
[632] Industry expert, email message to USITC staff, April 23, 2024; World Bank, IFC, "First Project Under IFC's Global Food Security Platform," May 22, 2023.
[633] Government of Bangladesh, *National Food Policy 2006*, August 14, 2006; Government of Bangladesh, *Bangladesh Food Situation Report*, June 2024.
[634] Sayeed and Yunus, *Rice Prices and Growth, and Poverty Reduction in Bangladesh*, 2018, 4.
[635] Sayeed and Yunus, *Rice Prices and Growth, and Poverty Reduction in Bangladesh*, 2018, 4, 14.
[636] USDA, FAS, *Grain and Feed Update: Bangladesh*, December 21, 2023, 7; Sayeed and Yunus, *Rice Prices and Growth, and Poverty Reduction in Bangladesh*, 2018, 14.
[637] These include open market sales, Fair Price/Food Friendly/FFP, Food for Work, Vulnerable Group Feeding, and Vulnerable Group Development. USDA, FAS, *Grain and Feed Update: Bangladesh*, December 21, 2023, 7.
[638] Sayeed and Yunus, *Rice Prices and Growth, and Poverty Reduction in Bangladesh*, 2018, 8.

subsidies, helping to lower the costs of fertilizer, seeds, and energy.[639] The government is also working with organizations like IRRI and CGIAR on research to develop new seed varieties that are higher yielding and more tolerant of salt and heat, and it provides subsidies for these newly developed seeds.[640] In an effort to encourage mechanization and increase productivity, the government also reportedly provides subsidies ranging from 50 percent to 70 percent of the purchase price of machinery such as rice harvesters and transplanters.[641] Finally, the government has made large investments in irrigation and provides subsidies for water to reduce dependence on monsoon patterns in the presence of increased volatility due to climate change.[642]

Bangladesh also receives support from the international community.[643] In addition to seed development, international organizations are also working with BRRI to organize farmers into cooperatives to help disseminate information and new seed varieties.[644] The Bangladeshi government has also worked with aid groups, such as the U.S. Agency for International Development and the International Finance Corporation, to help educate farmers through extension programs on the most efficient use of chemical inputs and more effective planting techniques.[645]

The government of Bangladesh uses trade policies to further support the rice industry with a goal of supporting domestic market stability. In times of lower production, the government has reduced tariffs on rice to encourage imports to cover the immediate demand shortfall.[646] Reportedly the government has taken steps to reduce trade restrictions and increase regional linkages, particularly with major import sources like India.[647] However, in response to increasing prices and policy restrictions by major

[639] Industry expert, email message to USITC staff, April 23, 2024; Saha et al., "Rice Quality and Its Impacts on Food Security and Sustainability in Bangladesh," December 31, 2021, 3; Sayeed and Yunus, *Rice Prices and Growth, and Poverty Reduction in Bangladesh*, 2018, 4, 6, 14.
[640] Sayeed and Yunus, *Rice Prices and Growth, and Poverty Reduction in Bangladesh*, 2018, 4, 6, 14; Saha et al., "Rice Quality and Its Impacts on Food Security and Sustainability in Bangladesh," December 31, 2021, 3; FE Online Desk, "Checking the Country's Fast-Shrinking Arable Land," August 15, 2020; IRRI, "Bangladeshi Rice Farmers' Preferences Can Help," September 9, 2024.
[641] Industry expert, email message to USITC staff, April 23, 2024; industry representative, interview by USITC staff, October 30, 2024; Government of Bangladesh, *National Food Policy,* January 1, 2008.
[642] Industry expert, email message to USITC staff, April 23, 2024; Saha et al., "Rice Quality and Its Impacts on Food Security and Sustainability in Bangladesh," December 31, 2021, 3; Sayeed and Yunus, *Rice Prices and Growth, and Poverty Reduction in Bangladesh*, 2018, 4, 6, 14; industry representative, interview by USITC staff, October 30, 2024.
[643] USAID, "Twice the Rice," October 3, 2023; USAID Bangladesh, "Less Fertilizer Equals More Rice, More Money in Bangladesh," June 15, 2014; IRRI, "GHG Mitigation in Rice—Bangladesh," accessed November 1, 2024; CIAT, World Bank, *Climate Smart Agriculture in Bangladesh*, 2017; World Bank, IFC, "First Project Under IFC's Global Food Security Platform," May 22, 2023.
[644] Muhammad Ashraful Habib, Swati Nayak, and Tahmina Akter, "The Farmers Who Till the Harsh Coastal Lands," August 1, 2023.
[645] Industry expert, email message to USITC staff, April 23, 2024; USAID, "Twice the Rice," October 3, 2023; USAID Bangladesh, "Less Fertilizer Equals More Rice, More Money in Bangladesh," June 15, 2014; World Bank, IFC, "First Project Under IFC's Global Food Security Platform," May 22, 2023.
[646] Industry expert, email message to USITC staff, April 23, 2024; Sayeed and Yunus, *Rice Prices and Growth, and Poverty Reduction in Bangladesh*, 2018, 16; Dhaka Tribune, "Import Duties on Rice Withdrawn to Ensure Adequate Supply," accessed November 1, 2024; Byron and Abbas, "Govt Decides to Lift Duties on Rice Imports," November 1, 2024.
[647] Sayeed and Yunus, *Rice Prices and Growth, and Poverty Reduction in Bangladesh*, 2018, 9.

trade partners, the Bangladesh Department of Commerce canceled export licenses in 2022 and again in 2023, in effect banning exports of all rice as part of efforts to stabilize domestic prices and ensure enough supply.[648] Given the 2024 political unrest in Bangladesh, the future of government involvement in the rice industry is unclear.[649]

Factors Limiting Export Potential

Despite being a major global rice producer, Bangladesh exports very little rice. The government of Bangladesh has prioritized domestic food security over global market participation and takes steps to limit exports in instances of insufficient production. Climate events that disrupt production, limited farm productivity, and poor infrastructure and weaknesses in the supply chain hinder the industry's export potential.

As described previously in "Government Programs," the government of Bangladesh prioritizes self-sufficiency in rice production. In an effort to keep rice prices down, the government imposes trade policies to restrict rice exports and encourage imports when domestic rice production falls short of demand.[650] However, due to production limitations, Bangladesh exported only minimal volumes of rice even when exports were not restricted by government policies prior to 2022 (table 5.10).

The lack of arable land available to convert to rice production and relatively low yield rates have limited rice production for exports. Bangladesh faces a yield gap compared with other major rice producers outside of South Asia.[651] Because rice farms are almost all smallholdings, farmers cannot benefit from economies of scale, hindering the growth of yields across the country. While government programs have attempted to increase yields, these efforts have seen limited success.[652] Poor access to inputs also contributes to Bangladesh's low yields. Producers face a lack of consistent access to official sources providing quality seeds. This leads to farmers procuring counterfeit and mishandled seeds at local markets.[653] During production, farmers also lack access to other legitimate inputs, leading to the use of counterfeit and low-quality chemical inputs.[654]

Bangladesh is strongly impacted by extreme climate and weather changes that can disrupt production for rice producers, further hindering the sector's self-sufficiency and export potential. Saltwater intrusion along the coast and increased salinity of groundwater negatively impact many rice varieties, hampering

[648] Kashem and Ali, "Govt Bans Aromatic Rice Export to Control Price," June 30, 2022; Karim and Wardad, "Aromatic Rice Exporters Suffer Blow as Govt 'abruptly' Bans Export," October 26, 2023; USDA, FAS, *Grain and Feed Update: Bangladesh*, August 27, 2024, 8; Uddin, "Aromatic Rice," September 4, 2024.
[649] Alam and Pathi, "Bangladesh's Prime Minister Quit and Fled the Country after Weeks of Protests. What's Next?," August 7, 2024; Yee and Ripon, "Bangladesh Prime Minister Flees to India as Anti-Government Protesters Storm Her Residence," August 5, 2024.
[650] Kashem and Ali, "Govt Bans Aromatic Rice Export to Control Price," June 30, 2022; Karim and Wardad, "Aromatic Rice Exporters Suffer Blow as Govt 'abruptly' Bans Export," October 26, 2023; USDA, FAS, *Grain and Feed Update: Bangladesh*, August 27, 2024.
[651] TBS Report, "Despite 3rd in Rice Production, Bangladesh Lags," October 2, 2023.
[652] ADB, *Bangladesh's Agriculture, Natural Resources, and Rural Development Sector Assessment and Strategy*, March 2023, 15; Tareq Ahmed Robin, "Full-Scale Farm Mechanisation in Bangladesh," August 2, 2023.
[653] IRRI, "Bangladeshi Rice Farmers' Preferences Can Help Guide Future Design and Implementation of Seed Initiatives for Agricultural Development," September 9, 2024.
[654] Sayeed and Yunus, *Rice Prices and Growth, and Poverty Reduction in Bangladesh*, 2018, 6–7.

growth. Salinity affects approximately 62 percent of coastal land, and salinization is expected to advance 8 km further inland by 2030.[655] By 2050, Bangladesh is projected to lose 17 percent of land as a result of rising sea levels and one-third of its agricultural GDP because of climate disasters.[656] Like the other countries in South Asia, Bangladesh's rice production also faces disruptions from extreme weather events such as drought, extreme rains and flooding, extreme temperatures, and large temperature swings. Hailstorms and cyclones that damage crops have also become more frequent.[657]

Even if Bangladesh were to achieve exportable surpluses of rice, its export competitiveness likely would be hampered by high delivery costs due, in part, to the country's poor transportation and marketing infrastructure. Poor road and port infrastructure and inadequate storage facilities lead to losses in transit. According to the World Bank, Bangladesh's infrastructure scores have fluctuated but decreased from 2.39 out of 5 in 2018 to 2.3 in 2023.[658] Despite significant investments in infrastructure, rural connectivity remains limited, with only 67 percent of the rural population served by all-season roads as of 2016.[659] Additionally, the lack of adequate storage facilities leads to both spoilage and hoarding along the supply chain. This creates market distortions and contributes to unreliable data on the rice industry, compounding the challenges for the government in its efforts to address rice industry needs and consumer demand.[660]

[655] CIAT, World Bank, *Climate Smart Agriculture in Bangladesh*, 2017, 7–8; Montu, "Bangladesh Rice Farmers Invent New Varieties to Withstand Salt, Storms," July 22, 2021.
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Chapter 6
East Asia and Southeast Asia

Summary

Rice, first domesticated in the Yangtze River basin 10,000 years ago in what is now China, is an essential crop and food staple in East Asia and Southeast Asia.[661] The region has 7 of the top 10 rice producers in the world and produces over half the world's rice crop. Rice production is mainly characterized by small farms, especially in Southeast Asia, but in certain places these small farms are highly efficient. The region has a mix of rainfed and irrigated paddies. East Asian and Southeast Asian countries make up the majority of the largest rice consumers globally, though people are diversifying diets away from rice as incomes around the region rise. Much of the rice trade in this region is intraregional, though exports to other parts of the world are increasing. Countries like Thailand and Vietnam are major exporters of rice and produce a surplus to domestic requirements. Some countries, such as Indonesia and the Philippines, are major importers of rice, despite being large producers, because domestic consumption outstrips production. Given the importance of rice as a food staple, governments in the region tend to be actively engaged in both the production and sourcing of rice for consumption.

Several factors, including government policies, marketing, and levels of investment, impact the region's competitiveness. The region's high reliability of supply and generally low delivered costs are supported by government policy. China and Indonesia provide extensive direct support to producers; the Vietnamese government provides what officials refer to as "market-oriented" support through robust research and extension systems. Thailand has an established brand for its high-quality jasmine rice, an aromatic variety, allowing it to command a premium, while brand marketing for Vietnam's increasingly high-quality rice remains in development. Rising costs, especially for labor, and issues with water availability constrain Thailand's and Indonesia's competitiveness. A lack of investment in the off-farm portion of the value chain—which is characterized by small firms, low margins, and insufficient financing—hampers Vietnam's rice industry.

Regional Overview

Production

In marketing year (MY) 2023/24, China, Indonesia, Vietnam, Thailand, the Philippines, Burma, and Cambodia were the largest rice producers in the region and among the top 10 globally (see table 6.1).[662] Together, these seven countries accounted for approximately 49 percent of global rice production in MY 2023/24.[663] With the exception of the Philippines and Cambodia, whose production increased 5 and 23 percent, respectively, over the MY 2018/19–2023/24 period, production for these major producers

[661] Gross and Zhao, "Archaeological and Genetic Insights into the Origins of Domesticated Rice," April 29, 2014.
[662] USDA, FAS, PSD Online database, accessed January 3, 2025.
[663] USDA, FAS, PSD Online database, accessed October 8, 2024.

trended down by 2–10 percent.[664] In the case of China, Indonesia, and Vietnam, this decrease was driven by a decline in area harvested because of competition for cropland from other crops and urban development. Production increased in the Philippines as a result of an increase in area harvested and improved yields, which allowed it to surpass Burma's level of production.[665] Cambodian production increased for a variety of reasons, including use of higher quality seeds, lower input costs allowing for more fertilizer application, increased use of technology, as well as increased export demand.[666]

Table 6.1 East Asia and Southeast Asia: rice production, by country, marketing years 2018/19–2023/24
In thousands of metric tons.

Trade partner	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
China	148,490	146,730	148,300	148,990	145,946	144,620
Indonesia	34,200	34,700	34,500	34,400	33,900	33,020
Vietnam	27,344	27,100	27,381	26,670	27,140	26,625
Thailand	20,340	17,655	18,863	19,878	20,909	20,000
Philippines	11,732	11,927	12,416	12,540	12,625	12,325
Burma	13,200	12,650	12,600	12,400	11,800	11,900
Japan	7,657	7,611	7,570	7,636	7,480	7,272
Cambodia	6,000	6,243	6,271	6,561	6,963	7,174
South Korea	3,868	3,744	3,507	3,882	3,764	3,702
Laos	1,680	1,600	1,900	1,950	1,950	1,920
All others	4,543	4,900	4,425	4,131	4,164	4,114
Total	279,054	274,860	277,733	279,038	276,641	272,672

Source: USDA, FAS, PSD Online database, accessed October 8, 2024.
Note: The marketing year is January 1–December 31 for Indonesia, Vietnam, Thailand, Burma, Cambodia, and Laos; July 1–June 30 for China and the Philippines; and November 1–October 31 for Japan and South Korea. All other countries in East Asia and Southeast Asia consist of Malaysia, North Korea, Taiwan, Brunei, Hong Kong, and Singapore.

Rice production in the region is dominated by small, mostly irrigated farms with varying levels of mechanization. Landholdings in Indonesia, Vietnam, Thailand, and Japan are small scale in nature, with an average size typically less than 3 hectares (ha); China's farm sizes have grown as a result of modernization. Rice production in China, Vietnam, Indonesia, the Philippines, and Japan is mostly irrigated; instead, production in Thailand, Burma, and Cambodia is predominantly rainfed.[667] China and Indonesia produce largely for their own domestic markets, whereas Thailand and Vietnam produce for both domestic and export markets. Thailand, Vietnam, Indonesia, and China all grow mostly indica long

[664] Burma's production decreased by 10 percent; China, Indonesia, Vietnam, Thailand, and Japan's production decreased by 2–5 percent over the period. Burmese production decreased as a result of adverse weather conditions, insufficient irrigation water, rising production costs, and smaller planting areas, particularly in the conflict areas. USDA, FAS, *Grain and Feed Annual: Burma*, April 13, 2023, 4; USDA, FAS, *Grain and Feed Annual: Burma,* April 1, 2021, 3; USDA, FAS, *Grain and Feed Annual: Burma, Union Of*, March 28, 2019, 3.
[665] The Philippines surpassed Burma in MY 2021/22. USDA, FAS, PSD Online database, accessed October 8, 2024. USDA, FAS, *Grain and Feed Annual: Philippines*, April 7, 2023, 4–5; USDA, FAS, *Grain and Feed Annual: Philippines*, March 24, 2021, 6–7.
[666] USDA, FAS, *Grain and Feed Annual: Cambodia*, April 11, 2024, 3; USDA, FAS, *Grain and Feed Annual: Cambodia*, April 5, 2023, 3.
[667] Global Yield Gap Atlas, "Philippines," accessed October 9, 2024; OECD, *Agricultural Water Pricing: Japan and Korea*, 2010, 8; OECD, *Agricultural Policy Monitoring and Evaluation 2023*, October 30, 2023, 374; IRRI, "China and IRRI," accessed January 3, 2025.

grain rice varieties, though short grain and medium grain japonica rice varieties also constitute a minor share of production. Aromatic jasmine rice is primarily grown in Thailand, Vietnam, and Cambodia.[668]

Consumption

Rice is the most important staple in the region, constituting the largest share of caloric intake in East Asian and Southeast Asian diets. Seven of the 10 largest global rice-consuming countries are located in the region.[669] In aggregate terms, China and Indonesia are among the largest rice consumers, both regionally and globally.[670] Cambodia had the highest per capita rice consumption in the region during the 2018–23 period (266 kilograms [kg] per year, on average), followed by Laos (255 kg per year) and Vietnam (244 kg per year).[671] Despite being among the largest aggregate consumers globally, Indonesia and China have much lower per capita consumption (131 kg per year and 106 kg per year, respectively). Per capita consumption has been gradually declining in some countries, particularly China, Indonesia, and Vietnam, as a result of diversifying diets and increasing adoption of wheat-based foods.[672] In addition, as incomes rise in the region, demand for rice with superior quality attributes, such as fine grain texture and aroma, increases.[673]

Trade

Extensive interregional rice trade links the countries of East Asia and Southeast Asia.[674] Within Southeast Asia, net exporters (Thailand, Vietnam, Cambodia, and Burma) benefit from large river systems and plains suitable for rice production. Conversely, other countries (Brunei, Indonesia, Malaysia, the Philippines, and Singapore) are historically net importers of rice given how their geography limits production capabilities.[675] Generally, East Asian countries are net importers of rice, with China as the most active exporter in the region (table 6.2). Japan and South Korea represent the other major rice-consuming markets in East Asia, but their exports are not substantial.[676] Regional coordination on food security occurs through the Association of Southeast Asian Nations (ASEAN) Plus Three Emergency Rice Reserve (APTERR), which involves ASEAN, Japan, China, and South Korea.[677]

[668] USDA, ERS, “Rice Sector at a Glance,” September 27, 2023.
[669] USDA, FAS, PSD Online database, accessed January 3, 2025.
[670] Regionally, China and Indonesia are the two largest consumers. Globally, China and Indonesia are the largest and fourth-largest consumers, respectively. USDA, FAS, “PSD Online database,” accessed January 3, 2025.
[671] USITC calculations using USDA PSD Online consumption data and World Bank population data.
[672] To clarify, China’s per capita consumption, excluding feed use, has been declining; aggregate consumption, including feed use, may increase in some years, depending on China's feed supply and demand dynamics.
[673] Bairagi et al., “What Drives Consumer Demand for Rice Fragrance?,” December 3, 2019, 3475.
[674] Brunei, Burma, Cambodia, Indonesia, Laos, Malaysia, the Philippines, Singapore, Thailand, and Vietnam are the 10 member countries of the Association of Southeast Asian Nations (ASEAN). Rice trade within ASEAN does not receive preferential treatment under the ASEAN Free Trade Area, but individual countries have import policies that boost intra-ASEAN rice trade. Greenville, *ASEAN Rice Market Integration Findings from a Feasibility Study*, 2018, 15.
[675] Greenville, *ASEAN Rice Market Integration Findings from a Feasibility Study*, 2018, 15.
[676] ASEAN has separate free trade agreements with China (including Hong Kong), Japan, and South Korea. ASEAN, “Free Trade Agreements with Dialogue Partners,” accessed October 4, 2024.
[677] Greenville, *ASEAN Rice Market Integration Findings from a Feasibility Study*, 2018, 26.

Table 6.2 East Asia and Southeast Asia: exports of rice, by trade partner, 2018–23
In thousands of metric tons. n.a. = data not available; ** = rounds to zero.

Trade partner	2018	2019	2020	2021	2022	2023
Thailand	11,232	7,584	5,733	6,266	7,695	8,748
Vietnam	2,892	5,467	5,633	5,712	6,564	n.a.
China	2,089	2,747	2,304	2,448	2,215	1,626
Burma	965	1,770	1,970	1,448	2,003	1,574
Cambodia	441	555	654	635	642	n.a.
Singapore	40	76	100	152	131	157
Taiwan	57	91	223	192	141	129
Malaysia	20	25	58	97	114	123
South Korea	64	53	55	52	54	61
Japan	46	49	41	43	31	43
Hong Kong	17	15	12	11	10	10
Indonesia	3	**	**	3	3	2
Brunei	2	**	**	**	**	1
Philippines	**	**	**	**	**	**
Total	17,868	18,433	16,784	17,061	19,602	12,473

Source: S&P Global, Total exports, HS heading 1006, rice, accessed August 2, 2024.
Note: Burma import data was calculated by aggregating exports from Burma as reported by all other countries.

Thailand exports several varieties of rice and is the top exporter of the East Asian and Southeast Asian region. Among the main exporters in the region, Thailand's exports are the most geographically diverse.[678] This is partly due to Thailand's position as the leading exporter of jasmine rice, which is a type of long grain aromatic rice grown in Southeast Asia and demanded by a variety of markets.[679] Another reason for this diversification of export markets is Thailand's declining share of trade in nonaromatic long grain white rice, which is a widely traded rice in East Asia and Southeast Asia. Over the previous decade, Vietnam has gradually eroded Thailand's footprint in the global market of lower cost, long grain white rice.[680] This decline was steepest from 2018 to 2020 when global importers found alternatives to Thailand's high prices and Thai producers grappled with a significant drought in 2019 and 2020.[681] Recovery began in 2021 when countries such as South Africa, Iraq, and China purchased more Thai rice—a trend that continued into 2023 amid India's export restrictions on certain types of rice, which tightened globally exportable supplies.[682]

Vietnam is one of the region's primary exporters. From 2018 to 2022, Vietnamese exports grew 127 percent, fueled primarily by shipments to the Philippines, Indonesia, Malaysia, and Singapore.[683] For these countries, Vietnam is an important source of low-cost, long grain white rice, which supplies these

[678] Consult table 6.10 for further information on Thailand's export partners.
[679] Behera and Panda, "Germplasm Resources, Genes and Perspective for Aromatic Rice," July 1, 2023, 294.
[680] Industry representative, interview by USITC staff, June 12, 2024; industry expert, interview by USITC staff, June 13, 2024; industry representative, interview by USITC staff, June 14, 2024.
[681] USDA, FAS, *Commodity Intelligence Report*, October 1, 2021; USDA, FAS, *Grain and Feed Annual: Thailand*, March 13, 2020.
[682] These countries normally import low-cost rice for their domestic stocks. Industry representative, interview by USITC staff, June 12, 2024; industry representative, interview by USITC staff, June 14, 2024; Thomas, Storey, and Fox, "Iraq Emerges to Dominate Thai White Rice Market," May 24, 2022; S&P Global, HS subheading 1006.30, semi-milled or wholly milled rice, whether or not polished or glazed, accessed various dates.
[683] The most recent year of Vietnam's available trade data is 2022. For more information on Vietnam's trade partners, consult tables 6.7 and 6.8. S&P Global, Total exports, HS heading 1006, rice, accessed various dates.

countries' domestic stocks.[684] In addition to these markets, Vietnam maintains significant market share in China, mostly supplying glutinous rice for further processing.[685] Additionally, Vietnam is an emerging global exporter of fragrant rice, although its reputation in this market segment is less established than Thailand's.[686]

China, Cambodia, and Burma are less significant rice exporters in the region than Thailand or Vietnam. China's rice industry is not export oriented. However, considering the size of China's rice market, even its small percentage (1–2 percent) of exports as a share of production influences global trade.[687] China exports short and medium grain white rice to markets that are mostly outside of East Asia and Southeast Asia.[688] These shipments have weakened each year since 2019, reflecting shifts in domestic animal feed use and lower price competitiveness with Indian rice exports.[689]

Cambodia exports milled rice (mostly fragrant varieties) to China, Malaysia, and Brunei and paddy rice to Vietnam, where it enters under favorable tariffs and quotas and benefits from the Vietnamese industry's superior milling capacity.[690] Beyond the region, Cambodia has developed a substantial market share in the EU through the EU's Everything but Arms scheme.[691] Burma similarly benefits from the EU's Everything but Arms scheme, especially in its broken rice exports, where the EU is its top market. On the other hand, Burma's top milled rice markets include Indonesia, the Philippines, China, and Malaysia.[692] However, Burma's rice industry has declined since 2021 amid the ongoing military conflict within Burma, which has resulted in periodic export controls as the country grapples with food insecurity and the effects of sanctions on its economy.[693]

Led by major rice importers in the region—the Philippines, Indonesia, China, Malaysia, and Vietnam—rice imports in Southeast Asia and East Asia have increased in recent years (table 6.3). Southeast Asian countries primarily import long grain rice, aromatic rice, and glutinous rice from neighboring ASEAN countries. Despite being major rice producers, the Philippines and Indonesia rely on imports because domestic production that is constrained by land availability cannot meet demand for their large

[684] Industry representative, interview by USITC staff, June 17, 2024; foreign government official, interview by USITC staff, Vietnam, June 20, 2024; subject matter expert, interview by USITC staff, Vietnam, June 21, 2024.
[685] Foreign government official, interview by USITC staff, Vietnam, June 24, 2024; An, "Vietnamese Rice Exports to China Fall," February 15, 2023.
[686] Industry representative, interview by USITC staff, Vietnam, June 19, 2024; subject matter expert, interview by USITC staff, Vietnam, June 19, 2024.
[687] For further information on China's exports-to-production ratio, consult table 6.12. USDA, FAS, PSD Online database, accessed October 11, 2024.
[688] Of China's top 10 export market destinations, only North Korea, Japan, and Mongolia are within the region. For further information on China's export partners, consult tables 6.15 and 6.16.
[689] USDA, FAS, *Rice Prices and Domestic Demand Shape Trade Landscape*, October 15, 2021, 4.
[690] From 2018 to 2023, much of this paddy rice trade occurred through unofficial channels and is not reflected in Vietnam's trade data. USDA, FAS, *Grain and Feed Annual: Cambodia*, April 11, 2024, 5-8; Government of Vietnam, the Ministry of Finance, Decree 05/2024/ND-CP, January 26, 2024.
[691] The Everything but Arms scheme removes tariffs and quotas on all goods (except arms and ammunition) coming into the EU from least developed countries. European Commission, "Everything but Arms (EBA)," accessed October 7, 2024. USDA, FAS, *Grain and Feed Annual: Cambodia*, April 11, 2024, 8.
[692] USDA, FAS, *Grain and Feed Annual: Burma, Union Of*, May 7, 2024, 10.
[693] USDA, FAS, *Grain and Feed Annual: Burma, Union Of*, May 7, 2024.

populations.[694] By contrast, Vietnam, a major rice exporter, has increased imports of paddy rice for milling and export, as well as for domestic animal feed use and processing purposes.[695]

Table 6.3 East Asia and Southeast Asia: imports of rice, by trade partner, 2018–23
In thousands of metric tons. n.a. = data not available.

Trade partner	2018	2019	2020	2021	2022	2023
Philippines	1,784	2,768	2,087	2,952	3,868	3,611
Indonesia	2,251	445	356	408	429	3,063
China	3,037	2,503	2,911	4,923	6,159	2,598
Malaysia	808	969	1,220	1,154	1,242	1,408
Vietnam	58	52	183	1,185	896	n.a.
Japan	672	679	677	663	669	709
Singapore	288	323	396	382	370	434
South Korea	425	328	526	493	483	282
Hong Kong	326	317	313	289	290	270
Taiwan	102	115	104	105	125	115
Brunei	38	40	37	28	29	20
Thailand	15	33	45	25	7	16
Burma	8	4	2	2	3	5
Cambodia	11	23	18	11	8	n.a.
Total	9,822	8,598	8,875	12,621	14,579	12,531

Source: S&P Global, General imports, HS heading 1006, rice, accessed August 2, 2024.
Note: Burma import data was calculated by aggregating exports to Burma as reported by all other countries.

East Asian countries, particularly Japan and South Korea, import rice mainly because of trade agreements, consumer preferences, and food security concerns. Rice consumption continues to decline in these countries, so rice imports are less necessary than they are in Southeast Asia.[696] China is a significant rice importer in the region, traditionally importing rice from neighboring ASEAN countries. East Asia mainly imports long grain rice, including aromatic varieties, from South Asia and Southeast Asia and medium grain rice primarily from the United States. Although Japan and South Korea are not major rice importers from a quantity perspective, they are important markets for exports of U.S. medium grain rice.[697]

Rice imports in East Asia and Southeast Asia are shaped by each country's production capacity, consumption patterns, and import policies. As noted above, China and Indonesia have large populations that demand large quantities of rice. Because agricultural self-sufficiency has been an important goal for both countries,[698] the governments use policies such as tariff-rate quotas (in China) and rice reserves and trade management through state-owned enterprises (in both countries) to support domestic production.[699] During 2018–23, China saw a surge in imports of broken rice, chiefly from India, Pakistan,

[694] USDA, FAS, *Grain and Feed Update: Philippines*, October 3, 2024, 3; USDA, FAS, *Grain and Feed Annual: Indonesia*, April 1, 2024, 6; USDA, FAS, *Retail Foods Annual: Indonesia*, October 3, 2024, 3.
[695] USDA, FAS, *Grain and Feed Annual: Vietnam*, April 11, 2024, 19.
[696] USDA, FAS, *Grain and Feed Annual: Japan*, March 20, 2024, 14; USDA, FAS, *Grain and Feed Update: Korea - Republic Of*, July 3, 2024, 4.
[697] For more information, see chapter 9 of this report.
[698] USDA, FAS, *Top Ag Policy Document Outlines Food Security*, March 12, 2024, 2; USDA, FAS, *Retail Foods Annual: Indonesia*, October 3, 2024, 2.
[699] USDA, FAS, *Grain and Feed Annual: Indonesia*, April 1, 2024, 20–22; USDA, FAS, *Grain and Feed Annual: China—People's Republic Of*, April 2, 2024, 24–28.

and Burma, to support its animal feed industry.[700] By comparison, Indonesia's increased imports were primarily due to extended drought from El Niño conditions.[701]

The Philippines, the top rice importer in the region in 2023, reworked its import regime in 2019 to reduce high inflation. The "Rice Tariffication Law" replaced the quantity restrictions on imported rice with tariffs and removed the monopoly the state-run National Food Authority had on importing rice.[702] The law established tariff-rate quotas for countries with normal trade relations, which were set at 40 percent for in-quota imports, 180 percent for out-of-quota imports; for ASEAN countries, the law established a tariff rate of 35 percent.[703] Since then, the Philippine government has reduced these tariff levels, first in 2021 bringing the normal trade relations rate for in-quota imports to 35 percent and, in July 2024, lowering the rate further to 15 percent through 2028 in an attempt to lower food prices amid high inflation.[704] The Philippines' reduction of tariff levels has led to increased imports, primarily from Thailand and Vietnam, and lower consumer prices for rice.[705] The government is reportedly using revenue from the rice tariffs to support productivity increases on rice farms.[706]

Higher-income countries such as Japan and South Korea rely less on agricultural production for economic output relative to other Asian countries; their rice markets, however, are heavily regulated by the government to protect domestic industry. Both countries have high import tariffs on rice, but trade commitments through the World Trade Organization (WTO) and free trade agreements with various partners allow certain amounts of rice to enter the country with no or lower duties.[707] The United States is a major rice supplier to both countries. With South Korea, the United States has a country-specific quota for U.S. rice, an annual purchase commitment of 132,304 metric tons.[708] Japan imports a minimum (under the Minimum Access quota) of 682,000 metric tons from all eligible countries—of which a maximum of 100,000 metric tons of rice is intended for table rice—to meet WTO commitments through a state-trading system (see chapter 9 for more information on U.S. exports to South Korea and Japan).[709] Imports over the past five years have remained relatively stable because imports that exceed quota allocations face prohibitively high tariff rates (table 6.3).

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[700] USDA, FAS, *Grain: World Markets and Trade*, April 2022, 10; USDA, FAS, *Grain: World Markets and Trade*, February 2023, 9.

[701] USDA, FAS, *Indonesia: El Nino Conditions Compel Indonesia to Import Additional 2 MMT of Rice*, October 6, 2023, 2–3.

[702] Government of the Philippines, "Act Liberalizing the Importation, Exportation and Trading of Rice, Lifting for the Purpose the Quantitative Import Restriction on Rice, and For Other Purposes," February 14, 2019; de Vera and Lagare, "Dominguez Defends Rice Import Liberalization Law," May 17, 2022.

[703] Tariff treatment for countries with normal trade relations is equivalent to World Trade Organization's most-favored-nation status. USDA, FAS, *Philippines: Rice Tariffication Guidelines Approved*, April 10, 2019.

[704] Rana, "Philippines Rice Import Duty Cut from 35% to 15% Likely to Benefit Vietnam," June 21, 2024; USDA, FAS, *Philippines Reduces MFN Tariff Rates for Rice Imports*, May 18, 2021, 2; USDA, FAS, *Grain and Feed Update: Philippines*, October 3, 2024, 6–7.

[705] USDA, FAS, *Grain and Feed Update: Philippines*, October 3, 2024, 8.

[706] Government of the Philippines, Department of Agriculture Press Office, "Dominguez Defends Rice Import Liberalization Law," May 17, 2022.

[707] Japan tariff rates on rice imports within the Minimum Access quota is zero, but Japan's state trading agency can collect a mark-up, which functions as a tariff. USDA, FAS, *Grain and Feed Annual: Japan*, March 20, 2024, 14–15; USDA, FAS, *Grain and Feed Update: Korea - Republic Of*, July 3, 2024, 7–8.

[708] USDA, FAS, *Grain and Feed Update: Korea - Republic Of,* July 3, 2024, 7.

[709] USDA, FAS, *Grain and Feed Annual: Japan*, March 20, 2024, 14–15.

Vietnam

Vietnam is a major global producer of rice and the third-largest exporter in the world. With consistent, high yields of rice produced at a low cost, Vietnam is a major supplier of rice to export markets seeking reliable supplies of cheap long grain white rice, such as the Philippines and Indonesia. The government maintains policies that are focused on supporting the rice sector with investment in public infrastructure and research to develop new seed varieties and production practices. Producers in Vietnam are increasingly growing more premium rice, particularly aromatic rice, using new varieties that combine higher yields with flavors and textures in demand by consumers. However, competitiveness is constrained by lack of investment in the off-farm portion of the value chain, an undeveloped reputation for premium rice, and limited distribution linkages in high-value export markets.

Production

Between MY 2018/19 and MY 2023/24, Vietnam accounted for a consistent 5.0 percent of global rice production annually, averaging 27.0 million metric tons (MMT) (see table 6.4). Production was largely consistent over the period, decreasing by 2.6 percent (719,000 mt) between 2018 and 2023. Vietnam produces a number of rice types, including long grain, aromatic, and small volumes of glutinous rice. Vietnamese rice production is responsive to market demands, and the country is able to grow medium grain rice, though the volumes are relatively small.[710] Aromatic rice makes up an estimated 15–30 percent of total production.[711] Vietnam has 3.8 million ha of land in rice production and, with multiple harvests a year in much of that growing area, the harvested area of rice is consistently over 7 million ha.[712] The area of land harvested decreased by 7.2 percent during this period. This decrease was driven by farmers switching to higher value products like tree fruit and aquaculture, impacts from saltwater intrusion, and urbanization in the major rice-producing areas.[713] This decrease in area harvested was partly offset by a 5.0 percent increase in yields over the period. Rice yields in Vietnam are consistently about double the global average, stemming from ideal agronomic conditions, high rates of irrigation, and strong research and extension systems.[714] Reduced fertilizer use, driven by high prices, reportedly had little impact on yields as a result of the Vietnamese government's focus on improving the efficiency of fertilizer usage through improved application.[715]

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[710] Foreign government official, interview by USITC staff, Vietnam, June 24, 2024; subject matter expert, interview by USITC staff, Vietnam, June 21, 2024; subject matter expert, interview by USITC staff, Vietnam, June 19, 2024.
[711] Foreign government official, interview by USITC staff, Vietnam, June 20, 2024; USDA, FAS, *Grain and Feed Update: Vietnam*, October 13, 2023, 17, 22; USDA, FAS, *Grain and Feed Quarterly: Vietnam*, August 5, 2024, 8.
[712] U.S. government official, interview by USITC staff, September 20, 2024.
[713] Industry representative, interview by USITC staff, Vietnam, June 17, 2024; USDA, FAS, *Grain and Feed Annual: Vietnam*, April 7, 2023, 17; subject matter expert, interview by USITC staff, Vietnam, June 19, 2024; foreign government official, interview by USITC staff, Vietnam, June 20, 2024.
[714] Subject matter expert, interview by USITC staff, Vietnam, June 18, 2024; industry representative, interview by USITC staff, Vietnam, June 17, 2024; subject matter expert, interview by USITC staff, Vietnam, June 19, 2024.
[715] USDA, FAS, *Grain and Feed Annual: Vietnam*, April 7, 2023, 17–18.

Table 6.4 Vietnam: rice production, consumption, stocks, and trade, marketing years 2018/19–2023/24
In metric tons (mt), hectares (ha), kilograms (kg), metric tons per hectare (mt/ha), and percentages (%).

Attribute	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
Beginning stocks (1,000 mt)	1,034	1,097	1,080	2,789	2,855	2,620
Production (milled) (1,000 mt)	27,344	27,100	27,381	26,670	27,140	26,625
Area harvested (1,000 ha)	7,540	7,380	7,305	7,100	7,120	7,000
Yield (rough) (mt/ha)	5.8	5.9	6.0	6.0	6.1	6.1
Imports (1,000 mt)	500	400	2,300	2,350	2,750	2,900
Consumption and residual (1,000 mt)	21,200	21,350	21,700	21,900	21,900	22,000
Exports (1,000 mt)	6,581	6,167	6,272	7,054	8,225	8,600
Ending stocks (1,000 mt)	1,097	1,080	2,789	2,855	2,620	1,545
Exports-to-production ratio (%)	24.1	22.8	22.9	26.4	30.3	32.3
Ending stocks-to-use ratio (%)	3.9	3.9	10.0	9.9	8.7	5.0
Per capita consumption (kg)	223.4	222.9	224.5	224.7	223.0	222.5

Source: USDA, FAS, PSD Online database, accessed September 13, 2024; World Bank, Data: Population, accessed September 13, 2024.
Note: Per capita consumption was calculated using marketing year apparent consumption divided by calendar year population. All other data, including imports and exports, are based on the marketing year from January to December.

Consumption and Stocks

Vietnam is a major consumer of rice, consuming 22 MMT in MY 2023/24, representing 4.2 percent of global consumption (see table 6.4). Of this, over 80 percent is supplied by domestic production. Overall levels remained stable over the period, and the share of imports in consumption increased by 11 percentage points because of an increase in imports described in the trade section below. On a per capita basis, consumption slightly decreased between MY 2018/19 and MY 2023/24 by 1.0 kg/person (0.4 percent). This is likely due to rising incomes as consumers, particularly those in urban areas, diversify diets away from rice to other foods.[716] Vietnamese consumers are also increasingly buying more fragrant and other specialty rice, especially as domestic production of these types of rice increases.[717]

Vietnam has relatively small rice stocks, which totaled 1.5 MMT at the end of MY 2023/24 (see table 6.4). The government maintains a public stock of 250,000 mt of rice in case of an acute crisis, such as a natural disaster. Government and industry officials suggest that larger public stocks are not needed because production of rice is essentially year-round across the country and many growing areas can produce multiple crops a year.[718] Private stocks are reportedly about 1–1.5 MMT per year, and the government does not require or incentivize private stockholding, though it may suggest companies hold rice when the price is lower.[719] In 2018, the government relaxed rice stock requirements that required rice exporters to have a warehouse with a minimum 5,000 mt storage capacity; companies are now only required to have a warehouse.[720] In regular operations, export companies keep stocks low because they sell off rice from one harvest by the time the next crop is ready for harvest three months later.[721] The

[716] Industry representative, interview by USITC staff, June 17, 2024; foreign government official, interview by USITC staff, Vietnam, June 24, 2024; Tung, "Rice and food security issues in Vietnam," September 15, 2023.
[717] Foreign government official, interview by USITC staff, Vietnam, June 24, 2024; industry representative, interview by USITC staff, Vietnam, June 25, 2024.
[718] Industry representative, interview by USITC staff, June 17, 2024; foreign government official, interview by USITC staff, Vietnam, June 24, 2024; industry representative, interview by USITC staff, Vietnam, June 17, 2024.
[719] Industry representative, interview by USITC staff, Vietnam, June 17, 2024.
[720] Thanh, "New Policy on Rice Exportation Management in Vietnam," May 23, 2019.
[721] Industry representative, interview by USITC staff, Vietnam, June 19, 2024.

spike in ending stocks in MY 2020/21–2021/22 is likely due to the government's restricting rice exports briefly in spring 2020 because of COVID-19.[722]

Trade

Vietnam is a relatively small importer of rice, importing 896,000 mt of rice in 2022 (tables 6.5 and 6.6). Cambodia and India are the two biggest sources for rice imported by Vietnam and increases in imports from these countries drove the large growth in imports during 2018–23. Vietnam has long imported Cambodian long grain paddy rice for milling and export because of deep commercial relationships between Vietnamese rice companies and Cambodian farmers, but this trade did not always appear in official trade statistics.[723] The fivefold increase of rice imports from Cambodia since 2018 is likely in part the result of improved reporting and tracking of trade at the border due to tighter border protocols stemming from the COVID-19 pandemic.[724] In 2024, the Vietnamese government issued a decree that aimed to increase this rice trade with Cambodia through preferential quotas and tariffs, as well as set regulations.[725] Imports from India increased by nearly 400,000 mt in 2021 and remained at historically high levels in 2022 because Vietnamese importers sought low-cost rice for animal feed, beer brewing, and food processing.[726]

Table 6.5 Vietnam: imports of rice, by trade partner, 2018–22
In thousands of metric tons. ** = rounds to zero.

Trade partner	2018	2019	2020	2021	2022
Cambodia	**	4	129	746	574
India	2	1	14	391	277
China	22	23	20	25	17
Laos	8	4	6	9	17
Thailand	14	9	6	9	9
Burma	11	10	8	5	1
Japan	**	1	**	**	**
All others	1	**	**	**	**
Total	58	52	183	1,185	896

Source: S&P Global, General imports, HS heading 1006, rice, accessed August 2, 2024.
Note: Trade data for Vietnam was calculated by aggregating trade flows between Vietnam as reported by other countries. Where data was missing for certain trade flows, data was constructed from trading partners using UN Comtrade. UN Comtrade lacked full year data for 2023.

722 Vu, "Vietnam's Ban on Rice Exports Still in Force, Government May Set Limit," March 30, 2020.
723 USDA, FAS, *Grain and Feed Annual: Vietnam*, April 19, 2022, 29.
724 USDA, FAS, *Grain and Feed Annual: Vietnam*, April 19, 2022, 29.
725 Government of Vietnam, "Special Preferential Import Tariff to implement 2023-2024 Vietnam-Cambodia Arrangement on Bilateral Trade Enhancement," Decree 05/2024/ND-CP, January 24, 2024; *Vietnam Law & Legal Forum*, "Decree Issued to Boost Vietnam-Cambodia Trade," January 27, 2024.
726 Industry representative, interview by USITC staff, Vietnam, June 19, 2024; industry representatives, interviews by USITC staff, June 17, 2024; USDA, FAS, *Grain and Feed Annual: Vietnam*, April 19, 2022, 29.

Table 6.6 Vietnam: imports of rice, by trade partner, 2018–22
In thousands of dollars.

Trade partner	2018	2019	2020	2021	2022
Cambodia	129	2,205	86,774	417,625	432,636
India	1,615	672	10,181	267,826	217,447
Laos	7,298	3,885	5,427	6,770	15,739
China	17,052	13,352	13,351	13,786	12,984
Thailand	11,531	6,115	4,311	7,445	9,155
Burma	7,800	6,549	6,594	4,751	1,153
Japan	343	517	394	501	445
Italy	26	31	20	23	27
Philippines	0	33	4	55	14
Germany	0	0	0	0	13
All others	764	35	325	58	16
Total	46,559	33,395	127,383	718,840	689,627

Source: S&P Global, General imports, HS heading 1006, rice, accessed August 2, 2024.

Vietnam is the third-largest exporter of rice behind Thailand and India, exporting 8.2 MMT of rice in MY 2022/23, which represented approximately 30 percent of Vietnam's production in that year (table 6.4). In 2022, the primary destinations for Vietnamese rice exports are neighboring countries in the region, with the Philippines, China, Malaysia, and Indonesia accounting for 70.4 percent of total exports (see table 6.7). Vietnamese exports to most of these destinations are growing quickly, with exports to the Philippines increasing by more than sixfold between 2018 and 2022. Over the same period, exports to China, mostly glutinous rice for use in food processing, fluctuated as a result of China's domestic self-sufficiency policies and higher tariffs on glutinous rice.[727]

Table 6.7 Vietnam: exports of rice, by trade partner, 2018–22
In thousands of metric tons.

Trade partner	2018	2019	2020	2021	2022
Philippines	490	2,141	2,237	2,457	3,215
China	786	477	889	1,059	851
Côte d'Ivoire	185	584	442	428	656
Ghana	235	427	531	678	442
Malaysia	235	552	539	286	438
Indonesia	388	40	98	68	119
Singapore	52	100	114	116	101
Hong Kong	54	121	90	83	72
South Korea	93	67	71	66	66
Cambodia	0	1	11	40	65
All others	375	958	610	430	538
Total	2,892	5,467	5,633	5,712	6,564

Source: S&P Global, Total exports, HS heading 1006, rice, accessed August 2, 2024.

[727] Foreign government official, interview by USITC staff, Vietnam, June 24, 2024; An, "Vietnamese Rice Exports to China Fall," February 15, 2023.

Table 6.8 Vietnam: exports of rice, by trade partner, 2018–22
In thousands of dollars.

Trade partner	2018	2019	2020	2021	2022
Philippines	458,122	888,224	1,073,853	1,252,087	1,492,107
China	683,363	240,392	464,973	522,762	432,317
Côte d'Ivoire	156,571	252,633	211,470	218,346	294,602
Ghana	214,142	212,648	282,248	393,629	230,112
Malaysia	216,833	218,806	239,208	141,860	198,969
Indonesia	362,663	18,396	49,949	33,207	58,624
Singapore	46,606	53,391	61,033	67,002	54,932
Hong Kong	50,609	63,307	50,201	50,444	40,972
South Korea	85,602	28,938	31,853	35,667	33,530
Cambodia	167	449	5,306	18,787	32,107
All others	346,763	457,067	320,857	272,472	325,120
Total	2,621,440	2,434,252	2,790,951	3,006,262	3,193,392

Source: S&P Global, Total exports, HS heading 1006, rice, accessed August 2, 2024.

The Philippines and Indonesia are important destinations for Vietnam's low-cost, commodity long grain white rice and medium-quality aromatic rice.[728] This trade was historically done through government-to-government contracts. The Philippines liberalized its rice imports in 2019, moving from quotas to tariffs, and removed the monopoly the National Food Authority had on rice imports.[729] These policy changes increased the volume of rice the Philippines imported, which Vietnam was well placed to supply.[730] Vietnam and Thailand compete closely in these markets, and Vietnam has displaced Thailand as the major rice supplier to these markets. Vietnam reportedly offers lower cost rice at a better quality in terms of the percentage of brokens and in terms of consumer preference for Vietnam's fresher rice that was harvested within one year.[731]

Sub-Saharan Africa is another top export market for Vietnamese rice—a region where Vietnam is reportedly looking to expand exports of both low-cost long grain white rice and increasingly aromatic rice.[732] Côte d'Ivoire and Ghana are the largest markets for Vietnamese rice in the region, which, combined, saw a 679,000 mt (162 percent) increase between 2018 and 2022. Reports indicate the increase of Vietnamese exports to sub-Saharan Africa is due in part to India's rice export restrictions creating opportunities for other major exporters of low-cost rice.[733]

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[728] Foreign government official, interview by USITC staff, Vietnam, June 24, 2024; industry representative, interview by USITC staff, Vietnam, June 25, 2024.
[729] Foreign government official, interview by USITC staff, Vietnam, June 24, 2024; de Vera and Lagare, "Dominguez Defends Rice Import Liberalization Law," May 17, 2022.
[730] Foreign government official, interview by USITC staff, Vietnam, June 24, 2024; de Vera and Lagare, "Dominguez Defends Rice Import Liberalization Law," May 17, 2022.
[731] Industry representative, interview by USITC staff, Vietnam, June 17, 2024; industry representative, interview by USITC staff, Vietnam, June 17, 2024; industry representative, interview by USITC staff, Vietnam, June 12, 2024; foreign government official, interview by USITC staff, Vietnam, June 24, 2024.
[732] Viet Nam News, "Việt Nam Aims to Increase Rice Market Share in Africa," November 21, 2024; USDA, FAS, *Grain and Feed Annual: Vietnam*, April 7, 2023, 29.
[733] Nguyen, "Africa Is Vietnam's Leading Rice Export Market," February 21, 2024.

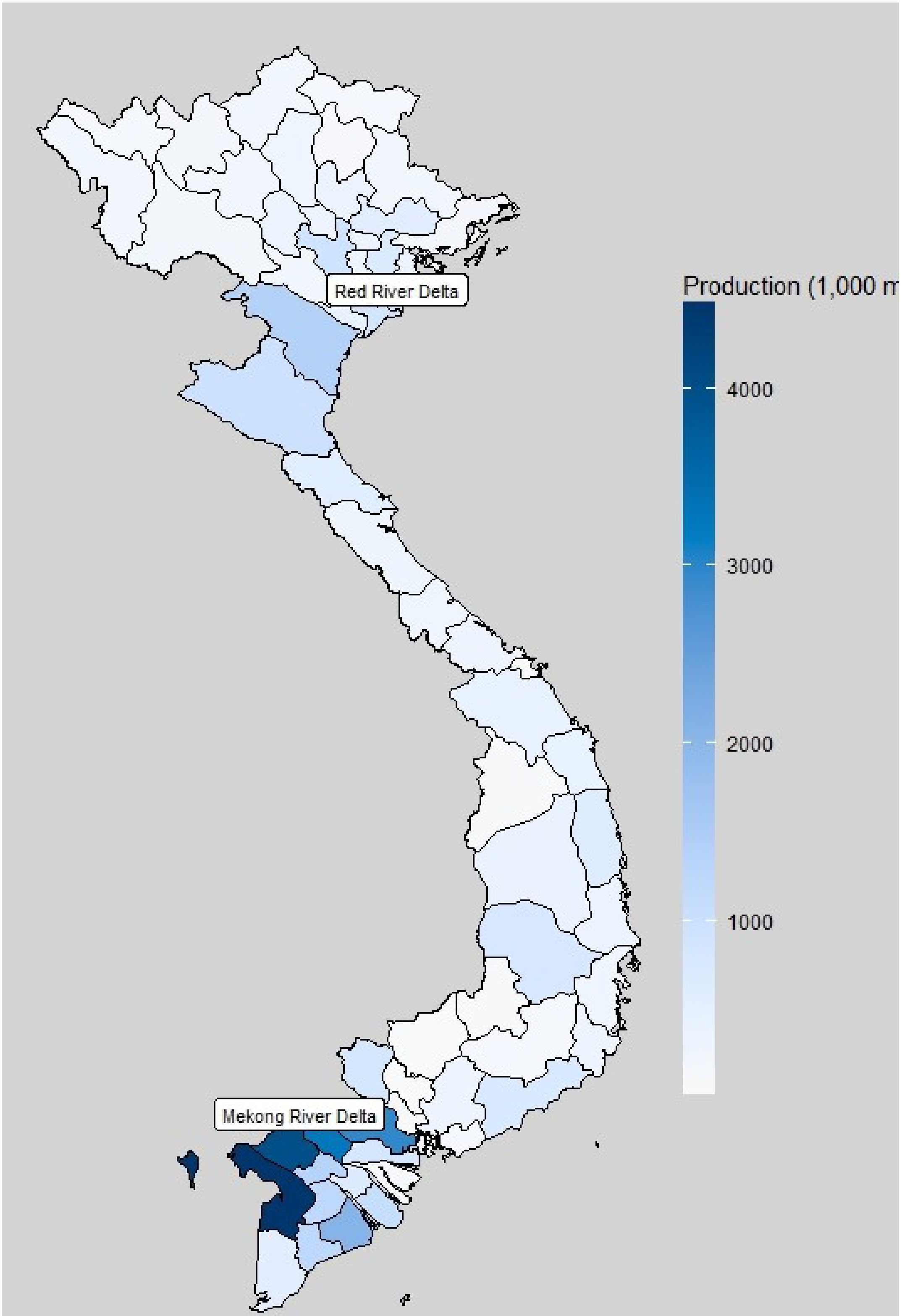
Industry Structure

Rice is widely grown throughout Vietnam, the primary growing regions being the Mekong River Delta in the south and the Red River Delta in the north (figure 6.1). Rice production in the Mekong River Delta is export oriented, accounting for 90 percent of the country's rice exports while comprising just over 50 percent of production.[734] The Red River Delta produces approximately one-fifth of Vietnam's annual rice crop and primarily supplies the domestic market, with some being exported to China.[735] The remaining 30 percent of Vietnam's rice crop is spread across the country and is primarily for subsistence or domestic markets.[736] In Vietnam, it is possible to harvest multiple rice crops per year, aided by a conducive growing environment, the widespread adoption of short season rice varieties, and high rates of irrigation.[737] Three harvests per year is standard in many parts of the Mekong River Delta, and the Red River Delta can generally grow two harvests per year.[738] Some areas are limited in the number of harvests possible per year because of environmental factors such as the sandy, nutrient-poor soils in certain parts of the northwestern area of the Mekong River Delta and saltwater intrusion in the lower part of the Mekong River Delta.[739]

[734] Industry representative, interview by USITC staff, June 17, 2024; USDA, FAS, Grain and Feed Update: Vietnam, October 13, 2023, 17; subject matter expert, interview by USITC staff, Vietnam, June 19, 2024.
[735] Industry representative, interview by USITC staff, June 17, 2024; foreign government official, interview by USITC staff, Vietnam, June 24, 2024; subject matter expert, interview by USITC staff, Vietnam, June 19, 2024.
[736] Industry representative, interview by USITC staff, Vietnam, June 25, 2024.
[737] Short season varieties of rice produce rice that is ready for harvest after 90 days rather than 120 or more days.
[738] Subject matter expert, interview by USITC staff, Vietnam, June 21, 2024; industry representative, interview by USITC staff, June 17, 2024; industry representative, interview by USITC staff, Vietnam, June 17, 2024.
[739] Subject matter expert, interview by USITC staff, Vietnam, June 18, 2024; industry representative, interview by USITC staff, Vietnam, June 17, 2024.

Figure 6.1 Vietnam: rice production by province, 2023

In thousands of metric tons (1,000 mt). Underlying data for this figure can be found in appendix F, table F.20.



Source: Compiled by the USITC. General Statistics Office of Vietnam, "Production of Paddy by Province by Cities," accessed October 31, 2024.

Vietnam primarily grows long grain rice, including aromatic varieties, and can produce low-cost rice for different market segments.[740] Many of the varieties grown are high yielding and have a short season, allowing for high volumes of production in multiple harvests per year.[741] Vietnam grows commodity nonaromatic long grain rice varieties often used for processing (e.g., IR5404), nonaromatic long grain white rice used for table consumption (e.g., OM5451), aromatic long grain (e.g., OM18 and DT8), and premium aromatic varieties like ST24 and ST25 that have won tasting awards.[742] Many stakeholders in the Vietnamese rice industry believe the flavor and eating quality of their aromatic rice are on a par with, if not higher than, Thai jasmine rice.[743] The Vietnamese government and industry are trying to build an international brand around the ST24 and ST25 varieties.[744] The land area for the ST24 and ST25 varieties, however, is limited to about 100,000 ha because they require certain soil types and growing conditions.[745] They are, however, highly suited to areas impacted by saltwater intrusion due to their salt-tolerance and are well-suited for the rice-shrimp cropping model.[746]

Vietnam has 30 million rice farms, and the vast majority are relatively small holdings, with average farm sizes of 0.5–1 ha per farm household in the Red River Delta and 1–5 ha in the Mekong River Delta.[747] As Vietnam industrializes, more farmers are migrating to urban areas for off-farm work, such as in manufacturing, resulting in a gradual increase in farm sizes as land becomes consolidated.[748] However, this process has experienced some recent reversals, because COVID-19-related shutdowns prompted some people to move back to their farms.[749] The government is encouraging the consolidation of small rice farms to increase economies of scale and is also promoting the professionalization of cooperatives.[750] Currently, the many cooperatives are reportedly more like social groups among farmers than a business structure because many cooperatives lack the capacity to operate as a business.[751]

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[740] Industry representative, interview by USITC staff, June 17, 2024; foreign government official, interview by USITC staff, Vietnam, June 20, 2024; subject matter expert, interview by USITC staff, Vietnam, June 21, 2024.
[741] Foreign government official, interview by USITC staff, Vietnam, June 20, 2024; subject matter expert, interview by USITC staff, Vietnam, June 19, 2024.
[742] U.S. government official, interview by USITC staff, September 20, 2024; *Vietnam Plus*, "Vietnam Wins World's Best Rice Title for Second Time," November 30, 2023; USDA, FAS, *Grain and Feed Update: Vietnam*, October 13, 2023, 17; USDA, FAS, *Grain and Feed Quarterly: Vietnam*, October 21, 2024, 18.
[743] Industry representative, interview by USITC staff, Vietnam, June 19, 2024; subject matter expert, interview by USITC staff, Vietnam, June 19, 2024.
[744] Foreign government official, interview by USITC staff, Vietnam, June 24, 2024; Pillalamarri, "Vietnam's Battle to Market Its Prized Rice," July 16, 2021.
[745] Subject matter expert, interview by USITC staff, Vietnam, June 19, 2024.
[746] Subject matter expert, interview by USITC staff, Vietnam, June 19, 2024; subject matter expert, interview by USITC staff, Vietnam, June 21, 2024; industry representative, interview by USITC staff, Vietnam, June 20, 2024.
[747] Industry representative, interview by USITC staff, Vietnam, June 19, 2024; foreign government official, interview by USITC staff, Vietnam, June 24, 2024.
[748] Foreign government official, interview by USITC staff, Vietnam, June 24, 2024; subject matter expert, interview by USITC staff, Vietnam, June 19, 2024.
[749] Foreign government official, interview by USITC staff, Vietnam, June 24, 2024; foreign government official, interview by USITC staff, Vietnam, June 24, 2024.
[750] Foreign government official, interview by USITC staff, Vietnam, June 24, 2024; foreign government official, interview by USITC staff, Vietnam, June 24, 2024.
[751] Subject matter expert, interview by USITC staff, Vietnam, June 21, 2024; Rikolto International s.o.n. (Rikolto), "Sustainable and Inclusive Rice in Vietnam," May 16, 2023.

Despite their small size, nearly all farms are irrigated and are mechanized in at least a portion of the production process. The government has long invested in irrigation infrastructure and provides irrigation for free as a public good. Despite this, inconsistent irrigation infrastructure is reported.[752] The majority of farmers have access to farm equipment, primarily through service providers, cooperatives, or equipment rental services that are reportedly affordable for smallholder farmers.[753] Besides widespread mechanized tilling and harvesting, the use of drones for seeding and spreading pesticides and fertilizers is increasingly being used by farms.[754]

The majority of a farm's costs are for inputs, with fertilizers and pesticides accounting for about 60 percent of total costs.[755] These costs have been rising in recent years, as described in chapter 3, and the government has been encouraging farmers through extension programs to reduce the use of these inputs as a means to decrease costs and increase farm revenue.[756] Labor comprises the other large cost category, accounting for about 30 percent of farm costs.[757] Total farm costs are estimated to be about 50 percent lower than in Thailand and may be as low as $100 per mt.[758]

The multitude of small farms in Vietnam's rice industry means that middlemen are prominent and important actors in the rice value chain, despite raising costs. Most farmers lack the technical capacity or the connections to interact with millers and other off-farm actors, and it is impractical for many firms to work with numerous small farms.[759] Middlemen, who are primarily local businesspeople who have contracts with rice mills, coordinate production among farmers, including varieties and pricing, and provide access to farm equipment.[760] They help ensure the rice is being grown to the buyer's specifications, such as meeting maximum residue level in export markets. After harvest, they bundle and transport rice on small boats across the delta regions to mills.[761] Middlemen typically do not have contracts specifying prices with farmers and prefer to buy on the spot to avoid risks of changes in the rice price or a bad harvest.[762] According to an industry representative, rice mills prefer working with middlemen because they are registered businesses that can issue receipts, unlike most farms, allowing

[752] Foreign government official, interview by USITC staff, Vietnam, June 24, 2024; foreign government official, interview by USITC staff, Vietnam, June 20, 2024.
[753] Industry representative, interview by USITC staff, Vietnam, June 17, 2024; foreign government official, interview by USITC staff, Vietnam, June 24, 2024.
[754] Subject matter expert, interview by USITC staff, Vietnam, June 18, 2024; foreign government official, interview by USITC staff, Vietnam, June 20, 2024; subject matter expert, interview by USITC staff, Vietnam, June 20, 2024.
[755] Industry representative, interview by USITC staff, Vietnam, June 20, 2024; subject matter expert, interview by USITC staff, Vietnam, June 20, 2024.
[756] Subject matter expert, interview by USITC staff, Vietnam, June 20, 2024.
[757] Industry representative, interview by USITC staff, Vietnam, June 20, 2024; subject matter expert, interview by USITC staff, Vietnam, June 20, 2024.
[758] Industry representative, interview by USITC staff, Vietnam, June 20, 2024; subject matter expert, interview by USITC staff, Vietnam, June 18, 2024; *Bangkok Post*, "Hard Days Ahead for Rice," June 8, 2020; Hutasingh, "Thailand to Push for Fairer Rice Prices," September 4, 2022.
[759] Subject matter expert, interview by USITC staff, Vietnam, June 21, 2024; industry representative, interview by USITC staff, June 17, 2024.
[760] Subject matter expert, interview by USITC staff, Vietnam, June 21, 2024; industry representative, interview by USITC staff, June 17, 2024.
[761] Foreign government official, interview by USITC staff, Vietnam, June 24, 2024; U.S. government official, interview by USITC staff, September 20, 2024; subject matter expert, interview by USITC staff, Vietnam, June 21, 2024.
[762] Foreign government official, interview by USITC staff, Vietnam, June 24, 2024.

them to take advantage of the zero percent value added tax for exported rice.[763] However, the presence of middlemen in the value chain increases transaction and transportation costs.[764]

Even with the continued prevalence of middlemen in the industry, direct contracts between farmers and mills have become more common since 2013.[765] These mills sign contracts for a single growing season with farmers, often through cooperatives, specifying production methods.[766] Some mills may provide inputs at low or no cost or may provide interest-free loans to help cover the upfront costs of production when cash is scarce. Many contracts specify that the mills will pay the market price of rice at time of harvest to the farmers, otherwise the farmers could break the contract and sell at a higher price to another mill if the price rises.[767]

The farmers benefit from these contracts because they get better access to inputs, often at a lower cost, and improved production practices. Contracts also ensure farmers will have a buyer at harvest and often brings higher returns. Sources report that returns to farmers can be 2,000 VND ($0.08) higher than the market price, with a 10–15 percent reduction in costs.[768] The mills benefit by being better able to control the production process, which is important for meeting maximum residue levels and other sanitary and phytosanitary requirements, as well as reduce postharvest losses, allowing them to sell a higher value product in more lucrative markets.[769] However, it requires the mills to have the cash on hand upfront at the beginning of the season to provide inputs—as well as at the time of harvest to buy the rice—effectively restricting this practice to a few large rice mills.[770] It is reported that 50 percent of farmers in some provinces in the Mekong River Delta grow rice under these contracts, but the overall planted area of rice under contracts is still quite small.[771]

Vietnamese rice mills are active in sourcing rice from Cambodian farmers and will use this rice to complement their export offerings. Vietnamese mills work with Cambodian growers on rice production and then mill it in Vietnam.[772] Cambodian growers grow a mix of aromatic rice (such as the OM varieties) at specifications provided by Vietnamese companies, and lower-value nonaromatic commodity rice, especially as Vietnamese growers in the Mekong River Delta increasingly grow aromatic varieties.[773]

[763] Industry representative, interview by USITC staff, June 17, 2024.
[764] Subject matter expert, interview by USITC staff, Vietnam, June 21, 2024.
[765] Foreign government official, interview by USITC staff, Vietnam, June 20, 2024.
[766] Industry representative, interview by USITC staff, Vietnam, June 25, 2024; foreign government official, interview by USITC staff, Vietnam, June 20, 2024; industry representative, interview by USITC staff, Vietnam, June 17, 2024; subject matter expert, interview by USITC staff, Vietnam, June 20, 2024.
[767] Industry representative, interview by USITC staff, Vietnam, June 25, 2024.
[768] $1.00 U.S. dollar = 25,445 Vietnamese Dong. Subject matter expert, interview by USITC staff, Vietnam, June 20, 2024; industry representative, interview by USITC staff, Vietnam, June 19, 2024; industry representative, interview by USITC staff, Vietnam, June 20, 2024; U.S. Treasury, "Currency Exchange Rates Converter Tool," June 30, 2024.
[769] Industry representative, interview by USITC staff, Vietnam, June 19, 2024; industry representative, interview by USITC staff, Vietnam, June 20, 2024.
[770] Industry representative, interview by USITC staff, Vietnam, June 19, 2024; industry representative, interview by USITC staff, Vietnam, June 20, 2024.
[771] Foreign government official, interview by USITC staff, Vietnam, June 20, 2024; industry representative, interview by USITC staff, Vietnam, June 19, 2024.
[772] Foreign government official, interview by USITC staff, Vietnam, June 24, 2024; industry representative, interview by USITC staff, Vietnam, June 17, 2024; industry representative, interview by USITC staff, June 17, 2024.
[773] Foreign government official, interview by USITC staff, Vietnam, June 24, 2024.

Once the rice is harvested in Vietnam, it is transported to primarily privately owned facilities that dry, store, and mill the rice. Transportation infrastructure is an issue, especially in the south, because the roads are poor as a result of a lack of investment.[774] Most rice is transported by small boats in canals, which is cheaper than going by road.[775] Reportedly, most of Vietnam's 10–12 percent postharvest loss of rice occurs between harvest and drying and storage.[776] Vietnam's rice sector has moved away from drying rice naturally in the sun, with commercial dryers now more commonplace.[777] Storage facilities have also seen improvements.[778] Improvements in milling have led to a 3 percentage point increase in the milling rate to a relatively high 62.5 percent in 2023.[779] Once milled, the rice is bagged and packed in containers on barges for export.[780] Improvements in the off-farm value chain have been driven by public and private investment in recent years; however, this portion of the value chain remains a lingering constraint on rice production. Obstacles in the off-farm value chain include the prevalence of many small companies, low margins, and a lack of financing options.[781]

Most companies in the rice sector are private, though just under half of all rice exports are estimated to be through state-owned firms.[782] Over the last decade or so, the role and prominence of state-owned firms like Vinafood I and Vinafood II, which procure, mill, and export rice among other crops, as well as the parastatal Vietnam Food Association, have been markedly reduced.[783] The Vietnam Food Association used to allocate export quotas but now functions as an industry association.[784] Currently, state-owned firms are the organizing bodies for government-to-government rice export contracts, where any company can bid to fill part of the often large export contracts.[785] The majority of exports to the Philippines and Indonesia are done through government-to-government contracts.[786] Vietnam has a handful of large rice export companies, with reportedly three to four companies accounting for 10 percent of rice exports. The remaining 90 percent of exports are supplied by numerous small companies.[787] Typically, smaller export companies will bid on these government-to-government

[774] Foreign government official, interview by USITC staff, Vietnam, June 24, 2024.
[775] Foreign government official, interview by USITC staff, Vietnam, June 24, 2024.
[776] Subject matter expert, interview by USITC staff, Vietnam, June 21, 2024; industry representative, interview by USITC staff, Vietnam, June 17, 2024.
[777] Foreign government official, interview by USITC staff, Vietnam, June 20, 2024.
[778] USDA, FAS, PSD Online database, accessed October 8, 2024; industry representative, interview by USITC staff, June 17, 2024; foreign government official, interview by USITC staff, Vietnam, June 20, 2024.
[779] Industry representative, interview by USITC staff, Vietnam, June 17, 2024.
[780] Industry representative, interview by USITC staff, Vietnam, June 19, 2024.
[781] Industry representative, interview by USITC staff, Vietnam, June 17, 2024; industry representative, interview by USITC staff, Vietnam, June 19, 2024; subject matter expert, interview by USITC staff, Vietnam, June 18, 2024.
[782] Subject matter expert, interview by USITC staff, Vietnam, June 21, 2024; Vinafood II, "History of Business Formation," accessed November 7, 2024; Phuong, "Rice exports are a big success, but many top businesses still struggle to make a profit," January 13, 2024.
[783] Foreign government official, interview by USITC staff, Vietnam, June 24, 2024; U.S. government official, interview by USITC staff, September 20, 2024; foreign government official, interview by USITC staff, Vietnam, June 20, 2024.
[784] Foreign government official, interview by USITC staff, Vietnam, June 24, 2024.
[785] U.S. government official, interview by USITC staff, September 20, 2024; foreign government official, interview by USITC staff, Vietnam, June 20, 2024.
[786] Foreign government official, interview by USITC staff, Vietnam, June 24, 2024.
[787] Industry representative, interview by USITC staff, Vietnam, June 17, 2024.

contracts.[788] The larger export companies tend to focus on higher-value markets, and market under their own brand.[789]

Environmental changes are threatening and increasingly impacting rice production in Vietnam.[790] The main threat to rice production is from saltwater intrusion in the Mekong River Delta. Saltwater intrusion is caused by sea water infiltrating the soil, rendering land unsuitable for agricultural production, either temporarily or permanently depending on the severity. It is caused or exacerbated by several factors, including sea level rise and low water levels in the river. Typically, the water pressure from the fresh water flowing down the Mekong River and its distributaries keeps the saline water from flowing upstream. However, when water levels are low, caused either by droughts, which are increasingly common, or from dams being built upstream, less pressure keeps salt water from flowing up into the delta. In addition to saltwater intrusion, low water levels also result in less nutrient-rich silt being deposited, and less water available for irrigation in the dry season.[791] Vietnam is continuing to adapt to these impacts by building a system of dikes to control the flow of saltwater. In addition, the government is advising rice farmers in locations severely impacted by saltwater intrusion to stop growing rice entirely and, if possible, switch to other crops such as saltwater-resistant fruit trees. The government is also advising rice farmers in moderately impacted areas to alternate farming shrimp and rice or use salt-tolerant rice varieties and, in some areas, to delay or otherwise adjust the planting of rice in response to intrusion events.

Government Programs

The Vietnamese government reports that policies related to the rice sector are "market oriented."[792] Vietnam notified the WTO Committee on Agriculture that its rice-specific aggregate measure of support totaled 7.4 billion Vietnamese dong (approximately $290,000), less than 1 percent of the reported total value of rice production in 2020, the latest year reported.[793] Since the 1980s, Vietnam has gradually liberalized the rice industry, and now government support for the sector is primarily through investments in infrastructure and supporting research and extension systems to develop and promote the adoption of new technologies and practices.[794] This support for research and extension is organized around goals, such as to reduce the amount of inputs and reduce postharvest losses, which are then packaged into programs, like One Must Do, Five Reduce.[795] These programs are essentially technical assistance to farmers and others in the rice sector that promote new production practices and

[788] Industry representative, interview by USITC staff, Vietnam, June 25, 2024.
[789] Subject matter expert, interview by USITC staff, Vietnam, June 21, 2024.
[790] Foreign government official, interview by USITC staff, Vietnam, June 24, 2024; foreign government official, interview by USITC staff, Vietnam, June 24, 2024; foreign government official, interview by USITC staff, Vietnam, June 20, 2024.
[791] Foreign government official, interview by USITC staff, Vietnam, June 20, 2024.
[792] Foreign government official, interview by USITC staff, Vietnam, June 24, 2024.
[793] WTO, Committee on Agriculture, "Notification - Domestic Support: Vietnam," September 28, 2023.
[794] Foreign government official, interview by USITC staff, Vietnam, June 24, 2024.
[795] The "one must do" is to use certified rice seed, and the "five reduce" are to reduce the amount of seed, nitrogen, pesticides, and water used in production, and to reduce postharvest losses. IRRI, "GHG Mitigation in Rice - 1 Must Do, 5 Reductions," 2019.

technologies through easy-to-understand messaging across formats, including training sessions, posters, and radio and television programing.[796]

Besides providing irrigation water for free as a public good, as well as some tax incentives (such as not taxing the land used for growing), the Vietnamese government does not provide direct subsidies to rice farmers or companies.[797] Non-irrigation inputs are not subsidized, and no minimum support or export prices are maintained as in other rice-growing countries.[798] The government did restrict rice exports for a few months in spring 2020 in response to uncertain supply and demand conditions due to COVID-19, but this was short-lived.[799] As noted above, requirements for rice export companies to maintain rice drying and storage capacity were removed in 2018.[800] Many stakeholders report that the government does not require export companies to hold stocks of rice; others say it is a requirement but is not enforced.[801]

In November 2023, the Vietnamese government approved the One Million Hectares program, with the goal of having 1 million hectares of land in the Mekong River Delta producing high-value, low emission rice by 2030.[802] As part of this effort, the government aims to reduce postharvest losses to below 8 percent, reduce seeding rates, reduce chemical fertilizer and pesticide use by 30 percent, and decrease water usage by 20 percent, while reducing emissions by 10 percent. This new program incorporates existing programs and initiatives such as One Must Do, Five Reduce, by requiring all rice produced under this One Million Hectares program to use the production practices from at least one of those programs.[803] To achieve these goals, pilot plots and model cooperatives have been established to demonstrate the on-farm benefits to growers, extension services teach and promote the associated practices and help improve the business functioning of cooperatives, and the government encourages

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[796] Foreign government official, interview by USITC staff, Vietnam, June 24, 2024.
[797] Subject matter expert, interview by USITC staff, Vietnam, June 19, 2024; subject matter expert, interview by USITC staff, Vietnam, June 20, 2024; industry representatives, interviews by USITC staff, June 17, 2024.
[798] Industry representative, interview by USITC staff, June 17, 2024.
[799] At the end of March 2020, the Vietnamese government stopped issuing new export permits for rice to ensure sufficient domestic rice supplies. Then on April 10, 2020, the government of Vietnam announced a 400,000 mt rice export quota for the month of April. On April 22, 2020, an additional 100,000 mt was added to the monthly quota. Finally, at the end of April, all quotas and restrictions on rice exports were lifted. Government of Vietnam, Ministry of Industry and Trade, "Decision 1106/QD-BCT announcing export quotas for rice in April 2020," Decision 1106/QD-BCT, April 10, 2020; FAO, "Viet Nam Lifts Rice Export Restrictions," April 30, 2020; *Vietnam News Service*, "PM Allows Rice Export Resumption from May 1," April 29, 2020; Yen, "Vietnam Stops Exporting Rice from March 24 on Covid-19," March 25, 2020.
[800] Government of Vietnam, "On rice export business," Decree No. 107/2018/ND-CP, August 15, 2018; Viet Nam News, "New Decree Removes Barriers for Rice Exporters," September 1, 2018; Le, "New Policy on Rice Exportation Management in Vietnam," May 23, 2019.
[801] U.S. government official, interview by USITC staff, September 20, 2024; industry representative, interview by USITC staff, Vietnam, June 17, 2024.
[802] Government of Vietnam, "Scheme for Sustainable development of one million hectares of low-emission, high-quality rice in Mekong Delta through 2030," Decision 1490/QD-TTg 2023, November 27, 2023; Industry representative, interview by USITC staff, Vietnam, June 17, 2024; Kien, "The Government approved of the One Million Hectares High-Quality Rice Project," November 28, 2023.
[803] Industry representative, interview by USITC staff, Vietnam, June 17, 2024; Kien, "The Government approved of the One Million Hectares High-Quality Rice Project," November 28, 2023.

private investment and private companies to partner with farm cooperatives.[804] Longer-term, the government hopes the farm cooperatives will be able to sell emission credits.[805]

Factors Affecting Competitiveness

Vietnam is a reliable exporter of competitive cost rice in both low-value commodity and premium market segments. This competitiveness is driven by the country's ability to take advantage of the prime growing conditions and natural resources to produce multiple crops of rice a year, as well as government policies that have increased productivity. These policies help the sector adapt to challenges, including rising input costs, adapting to saltwater intrusion, and reducing the emissions from rice production. However, the lack of investment in the off-farm value chain, driven by small firms, low margins, and lack of financing, increases losses. In addition, limited linkages between Vietnamese exporters and businesses in higher-value export markets, combined with an undeveloped reputation for premium rice, further constrain Vietnam's competitiveness.

Steady, Low-Cost Rice Production from Full Utilization of Natural Endowments

Vietnam's growing conditions and natural resources allow the country's rice industry to produce a reliable supply of rice at a low cost. The country has a climate that is conducive to growing rice year-round and has different growing environments that allow a range of rice types to be grown, including long grain white, aromatic, and glutinous.[806] The rice industry uses short-season rice varieties that allow multiple crops to be grown on the same land—some areas are able to produce seven crops of rice in two years.[807] Many of these varieties are high-yielding, pest and disease resistant, and increasingly selected for attributes demanded by consumers. The abundance of fresh water and widespread irrigation infrastructure allow for very high rates of irrigation. High rates of mechanization reduce costs and increase yields. Intensive use of inputs, such as fertilizers, as well as their increasingly efficient application, further supports yields, while minimizing the impact of rising input costs. This results in Vietnam being able to reliably produce a domestic surplus of rice and have plenty of production available for export.

This reliably high production of a range of rice types at a low cost—reportedly about 50 percent lower than Thailand—allows Vietnam to be competitive in markets that depend on a stable supply of rice at a low price.[808] Between 2018 and 2023, Vietnamese rice incorporating 25 percent brokens (a proxy for quality) was priced 10 percent lower on average ($43.11 per mt) than the equivalent Thai rice.[809] Similarly, for higher quality rice incorporating 5 percent brokens, Vietnamese rice was priced 8 percent

[804] IRRI, "Vietnam's 1-Million Hectare Rice Program Shows Promising Results," September 16, 2024.
[805] Foreign government official, interview by USITC staff, Vietnam, June 24, 2024.
[806] Subject matter expert, interview by USITC staff, Vietnam, June 21, 2024.
[807] U.S. government official, interview by USITC staff, September 20, 2024.
[808] Subject matter expert, interview by USITC staff, Vietnam, June 21, 2024; industry representative, interview by USITC staff, Vietnam, June 20, 2024; subject matter expert, interview by USITC staff, Vietnam, June 18, 2024; *Bangkok Post*, "Hard Days Ahead for Rice," June 8, 2020; Hutasingh, "Thailand to Push for Fairer Rice Prices," September 4, 2022.
[809] FAO, "FPMA Tool," accessed October 2, 2024.

lower ($34.30 per mt) over the same period.[810] The ability to produce mid-range and higher tiers of rice, such as OM5451 and the aromatic DT8 (popular varieties in the Manila metro area in the Philippines) and sell them at competitive prices is another point of distinction for Vietnam.[811]

Government Rice Policies for Adapting to Challenges

The Vietnamese government's rice policies seek to enable the industry to take advantage of the country's natural resource endowments and adapt to challenges and threats to production, increasing the reliability of supply for Vietnamese rice. Government policy is geared toward providing public infrastructure and new production practices through robust research and extension systems. According to a U.S. government official, the Vietnamese government is very good at developing "good enough" production practices and getting them into widespread use.[812] Through this approach, which helps minimize market disruptions, the government helps the rice industry adapt to challenges like saltwater intrusion, rising input costs, and meeting maximum residue level requirements in higher-value export markets. These government supports have helped Vietnamese producers keep a supply steady and costs low and enabled access to new export markets.

An example of this is the One Million Hectares program, which considers the reduction of emissions from rice production as an intervention point to further modernize the sector. The program builds on the Vietnamese government's history of effectively working with a variety of partners to provide this type of support to the rice sector. The International Rice Research Institute, which the government has collaborated with since the 1980s, is the main implementer of the One Million Hectare program, along with U.S. Agency for International Development, the U.S. Department of Agriculture (USDA), and the World Bank. Initial results from pilot farms indicate a 50 percent decrease in the seeds used for planting; nitrogen fertilizer use decreased by nearly a third. At the same time, yields increased by 7 percent, resulting in a 10–15 percent decrease in production costs and up to a 20 percent increase in farm profits.[813]

High Losses from Lack of Investment in Off-Farm Value Chain

Insufficient investment in the off-farm value chain, such as in dryers and storage facilities, increases losses, reducing Vietnam's product differentiation and reliability of supply. Several compounding factors limit investment in this portion of Vietnam's rice sector. The low margins in this part of the rice industry limit returns on investment.[814] Numerous small firms make it difficult for firms to achieve economies of scale.[815] Also, access to financing is insufficient, with limited capital and high interest rates.[816] This is particularly an issue for smaller companies that are more likely working with unbranded, commodity long grain white rice shipping to lower-value export markets. This lack of investment in off-farm storage, drying, and processing facilities hinders widespread participation by Vietnamese export firms in higher

[810] FAO, "FPMA Tool," accessed October 2, 2024.
[811] Nam, "The Philippines favors Vietnam's OM5451 and DT8 rice varieties," June 12, 2024.
[812] U.S. government official, interview by USITC staff, April 1, 2024.
[813] IRRI, "Vietnam's 1-Million Hectare Rice Program Shows Promising Results," September 16, 2024.
[814] Industry representative, interview by USITC staff, Vietnam, June 17, 2024.
[815] Industry representative, interview by USITC staff, Vietnam, June 19, 2024.
[816] Industry representative, interview by USITC staff, Vietnam, June 19, 2024; subject matter expert, interview by USITC staff, Vietnam, June 18, 2024.

value export markets. If these challenges were resolved, it is possible Vietnam could produce and export more refined and value-added products, like polished rice or milling byproducts.[817]

This issue persists despite some improvement in recent years. In 2018, requirements for rice mills engaged in export to maintain a specific capacity in storage and drying facilities were removed—something many companies struggle to finance.[818] The sector has seen more investment in recent years, partially spurred by government initiatives.[819] However, most investments in the sector have occurred on the input side, not the postharvest side.[820] Small firms still abound, and interest rates across the economy, which is growing and industrializing, are high, making the cost to borrow in the low margin rice sector high.

Sales Limited in Higher-Value Export Markets from Underdeveloped Marketing

The marketing of Vietnamese rice in higher-value export markets is still nascent, including business connections among exporters and importers, consumer recognition, and developing a brand. This limits sales of Vietnamese rice in more lucrative export markets. Vietnamese export companies have limited business connections with buyers in higher-value markets, such as the United States, South Korea, the EU, and Japan, and industry stakeholders report that they are looking for distribution partners in these markets.[821] Some countries have a well-established reputation and consumer recognition for premium rice, such as Thai jasmine or Indian basmati, but Vietnam has long had a reputation for cheap commodity rice. Its higher value varieties are relatively unknown in markets like the United States.[822] With the development and increasing production of high-end rice varieties, like the fragrant ST24 and ST25, Vietnam is producing rice that is reportedly on a par with Thai jasmine. However, industry stakeholders recognize the need to further develop Vietnam's reputation for premium quality rice.[823] The government and the industry are trying to turn ST24 and ST25 rice into a brand, similar to Thai jasmine.

Thailand

Thailand is a significant global supplier of rice, exporting the second-largest volume worldwide in MY 2023/24. Thailand has a mature and established rice industry, exporting various types of rice (parboiled, long grain white, jasmine, and glutinous) to meet the different specifications of global importers. However, Thailand's share of global rice exports has declined since 2018 amid unchanging yields and greater international competition in the long grain white rice markets.[824] Thailand experiences high costs

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[817] Industry representative, interview by USITC staff, Vietnam, June 17, 2024.
[818] *Vietnam News*, "New Decree Removes Barriers for Rice Exporters," September 1, 2018; Thanh, "New Policy on Rice Exportation Management in Vietnam," May 23, 2019.
[819] Foreign government official, interview by USITC staff, Vietnam, June 20, 2024; industry representative, interview by USITC staff, Vietnam, June 17, 2024.
[820] Industry representative, interview by USITC staff, Vietnam, June 17, 2024.
[821] Industry representative, interview by USITC staff, Vietnam, June 20, 2024.
[822] Foreign government official, interview by USITC staff, Vietnam, June 24, 2024; Pillalamarri, "Vietnam's Battle to Market Its Prized Rice," July 16, 2021.
[823] Foreign government official, interview by USITC staff, Vietnam, June 24, 2024.
[824] Thailand's share of global export volumes has fallen from an estimated 25 percent in 2018 to 16 percent in 2023; for reference, consult chapter 2, table 2.5.

of production and lagging investment in improving yields, which threaten its competitiveness in some rice market segments. On the other hand, Thailand remains the primary global supplier of jasmine rice, and its legacy in this market segment supports both export sales to high-income markets and returns to its rice industry.[825]

Production

Between MY 2018/19 and MY 2023/24, Thailand accounted for 4 percent of global rice production, averaging 19.6 million metric tons.[826] Thai yields and harvested area have been relatively stable since MY 2018/19 (table 6.9). Thailand produces long grain white rice, parboiled long grain white rice, aromatic jasmine rice, and glutinous rice.[827] Overall, rice yields are low—averaging 2.8 metric tons per hectare (mt/ha) from MY 2018/19 to MY 2023/24—when compared to other global competitors. This lower yield stems from Thailand's reliance on rainfed rather than irrigated production and the predominance of photoperiod sensitive varieties.[828] About 80 percent of rice production occurs in the wet (major) season, with the dry (second) season harvest making up the remaining 20 percent.[829] In 2023, long grain white rice made up 45 percent of total production, with an average yield of 3.7 mt/ha.[830] Aromatic rice made up 35 percent of production, and within this total, the vast majority (30 percent of total national production) was Hom Mali, a premium variety of jasmine rice with its own standard of identity that yields 2.2 mt/ha.[831] Glutinous (or "sticky") rice similarly has a low yield of 2.5 mt/ha and was 20 percent

[825] Until 2012, Thailand was the only significant exporter of jasmine rice. Napasintuwong, *Rice Economy of Thailand*, January 2019, 26.
[826] USDA, FAS, "PSD Online," accessed October 8, 2024.
[827] Foreign government representative, email to USITC staff, June 13, 2024.
[828] "Photoperiod sensitive" signifies that a variety of rice requires specific day and night cycles for growth. Hom Mali is photoperiod sensitive and can only be grown once per year. Industry representative, interview by USITC staff, Thailand, June 12, 2024; Yuan et al., "Southeast Asia Must Narrow down the Yield Gap," March 2022, 218; Sujariya, Jongdee, and Fakai, "Estimation of Flowering Time and Its Effect on Grain Yield of Photoperiod Sensitive Varieties in Rainfed Lowland Rice in Northeast Thailand," October 15, 2023.
[829] The dry season crop is also known as "offseason" rice in other sources. USDA, FAS, *Commodity Intelligence Report*, October 1, 2021; Government of Thailand, Office of Agricultural Economics, Thailand: Wet Season Rice Production, accessed August 7, 2024; *Agricultural Statistics of Thailand 2023*, March 2024, 1. Government of Thailand, Office of Agricultural Economics, Thailand: Dry Season Rice Production, accessed August 7, 2024, 1.
[830] These yield estimates includes both wet season and dry season production for the respective varieties in 2023. Government of Thailand, Office of Agricultural Economics, *Agricultural Statistics of Thailand 2023*, March 2024, 7, 20.
[831] Hom Mali is only produced during the wet, or "major rice," season. Aromatic production includes Pathum Thani in addition to Hom Mali. For further information on some of Thailand's aromatic rice varieties, consult box 6.1. Government of Thailand, National Bureau of Agricultural and Commodity and Food Standards, "Thai Agricultural Standard: Thai Hom Mali Rice," December 19, 2003; Government of Thailand, "Agricultural Commodity Standards Act, B.E. 2551 (2008)," 5-7, February 13, 2008; Government of Thailand, Office of Agricultural Economics, *Agricultural Statistics of Thailand 2023*, March 2024, 7, 20; Prom-u-thai and Rerkasem, "Rice Quality Improvement and Review," July 21, 2020, 5.

of the total rice crop in 2023.[832] Other major aromatic varieties include Pathum Thani rice (PTT1) which, unlike Hom Mali, is grown in both seasons and has a higher yield of 4.2 mt/ha (box 6.1).[833]

Table 6.9 Thailand: rice production, consumption, stocks, and trade, marketing years 2018/19–2023/24
In metric tons (mt), hectares (ha), kilograms (kg), metric tons per hectare (mt/ha), and percentages (%).

Attribute	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
Beginning stocks (1,000 mt)	2,785	4,010	4,000	4,380	4,126	3,849
Production (milled) (1,000 mt)	20,340	17,655	18,863	19,878	20,909	20,000
Area harvested (1,000 ha)	10,830	9,890	10,509	10,702	11,072	10,650
Yield (rough) (mt/ha)	2.9	2.7	2.7	2.8	2.9	2.9
Imports (1,000 mt)	250	250	200	50	50	100
Consumption and residual (1,000 mt)	11,800	12,200	12,400	12,500	12,500	12,500
Exports (1,000 mt)	7,565	5,715	6,283	7,682	8,736	8,800
Ending stocks (1,000 mt)	4,010	4,000	4,380	4,126	3,849	2,649
Exports-to-production ratio (%)	37.2	32.4	33.3	38.6	41.8	44.0
Ending stocks-to-use ratio (%)	20.7	22.3	23.4	20.4	18.1	12.4
Per capita consumption (kg)	165.9	171.1	173.5	174.6	174.3	174.1

Source: USDA, FAS, PSD Online database, accessed September 13, 2024; World Bank, Data: Population, accessed September 13, 2024.
Note: Per capita consumption was calculated using marketing year apparent consumption divided by calendar year population. All other data, including imports and exports, are based on the marketing year.

Box 6.1 Markets for Hom Mali and Pathum Thani 1 Rice Varieties

Both Hom Mali (KDML105) and Pathum Thani 1 (PTT1) are varieties of jasmine rice developed in Thailand. Hom Mali represents an older variant of jasmine rice, first released to farmers in the 1950s.[a] The highest quality and highest value Hom Mali is grown in northeast Thailand, where it has adapted to the region's fluctuations in rainfall and poor soil fertility.[b] This environment helps produce this variety's desirable grain quality (high degree of translucency and whiteness) as well as fragrant properties (pandan leaf aroma) and cooking characteristics (soft texture, does not harden soon after cooking), which are valued by both Thai and overseas consumers.[c] Hom Mali's unique characteristics qualified the rice variety for protected geographical indication status from the European Union in 2013. It was granted similar property rights or trademark protections by Canada, the United Kingdom, Israel, and other trade partners.[d] Hom Mali normally commands the highest farmgate price in Thailand, averaging 13,579 baht/ton ($390/ton) from 2018 to 2023, while other paddy rice fetched 9,839 baht/ton ($283/ton).[e]

Pathum Thani 1 was released in 2000 as a fragrant rice better suited for year-round production and possesses higher yields than Hom Mali.[f] It is grown and harvested in all the major rice producing regions of Thailand, with the central region contributing 71 percent of the total crop in 2023.[g] PTT1 is also the most popular aromatic variety grown during the dry season, although its grain and cooking quality are considered substandard compared to Hom Mali's.[h] These quality differences result in lower prices (about 70 percent of Hom Mali's farmgate price, but usually above that of long grain white rice.[i]) PTT1 is marketed within Thailand simply as "fragrant" rice—a standard that was created to compete with lower

[832] Of these rice varieties, glutinous rice is primarily consumed by the domestic market being favored by Northern and Northeastern Thai consumers. Rerkasem, "The Rice Value Chain," January 2017, 4; Government of Thailand, Office of Agricultural Economics, *Agricultural Statistics of Thailand 2023*, March 2024, 7.
[833] Government of Thailand, Office of Agricultural Economics, *Agricultural Statistics of Thailand 2023*, March 2024, 7, 20; Sreethong et al., "Variation of Milling and Grain Physical Quality of Dry Season Pathum Thani 1 in Thailand," July 1, 2018, 191.

quality, lower priced Vietnamese fragrant rice.[j] The fragrant rice standard applies to all types of aromatic rice except for Hom Mali, which is subject to more stringent purity and quality requirements.[k]

[a] Vanavichit et al., “Thai Hom Mali Rice,” April 9, 2018, 1.
[b] Prom-u-thai and Rerkasem, “Rice Quality Improvement a Review,” July 21, 2020, 5; Vanavichit et al., “Thai Hom Mali Rice,” April 9, 2018, 2.
[c] Vanavichit et al., “Thai Hom Mali Rice,” April 9, 2018, 2 & 4; Prom-u-thai and Rerkasem, “Rice Quality Improvement. A Review,” July 21, 2020, 5.
[d] GI View, “Khao Hom Mali Thung Kula Rong-Hai,” accessed August 27, 2024; Government of Thailand, The Government Public Relations Department, “Protecting Intellectual Property Rights of Thai Hom Mali Rice,” March 20, 2023.
[e] Conversion rates based on average 2023 USD/baht or 1 USD = 34.80 baht; Internal Revenue Service, “Yearly Average Currency Exchange Rates,” accessed October 17, 2024; Government of Thailand, Office of Agricultural Economics, “Table 3: Agricultural Price at the farm gate,” August 20, 2024.
[f] Rerkasem, Benjavan, “Having Your Rice and Eating It Too: A View of Thailand’s Green Revolution,” 2007, 2; Government of Thailand, Office of Agricultural Economics, *Agricultural Statistics of Thailand 2023*, March 2024, 7.
[g] Government of Thailand, Office of Agricultural Economics, *Agricultural Statistics of Thailand 2023*, March 2024, 7 & 20.
[h] Government of Thailand, Office of Agricultural Economics, *Agricultural Statistics of Thailand 2023,* March 2024, 20.
[i] Sreethong et al., “Variation of Milling and Grain Physical Quality of Dry Season Pathum Thani 1 in Thailand,” July 1, 2018, 192.
[j] Sreethong et al., “Variation of Milling and Grain Physical Quality of Dry Season Pathum Thani 1 in Thailand,” July 1, 2018, 192.
[k] Napasintuwong, *Rice Economy of Thailand*, 2019, 28.

Consumption and Stocks

Rice consumption in Thailand has increased per capita since MY 2018/19 (table 6.9). Thailand consumes both aromatic (jasmine) and nonaromatic (glutinous and long grain white varieties of rice.[834] In addition to domestic production, Thailand imports rice for direct consumption in small quantities relative to its production (0.8 percent of consumption in MY 2023/24). These imports mostly consist of rice varieties not produced in Thailand (e.g., basmati from India and certain types of japonica rice from Japan).[835]

Nevertheless, dietary and demographic trends signal that rice consumption may be peaking within Thailand.[836] As Thai incomes rise, especially in Thailand’s urban areas, consumers eat less table rice per capita (80 kg per year) than in rural households (155 kg per year). Wealthier households tend to consume more expensive varieties of jasmine rice (e.g., Hom Mali).[837] Urban consumers are also altering Thailand’s distribution channels, preferring prepackaged rice from hypermarkets, supermarkets, and convenience stores over “loose” rice sold at traditional grocers.[838] Thailand’s continuing urbanization and rising per capita income are expected to contribute to slowing per capita rice consumption.[839]

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[834] Parboiled rice is not commonly consumed within Thailand and is instead produced for export. Rerkasem, “The Rice Value Chain,” January 2017, 3, 12.
[835] S&P Global, General imports, HS heading 1006, rice, August 28, 2024.
[836] Industry representative, interview by USITC staff, Thailand, June 12, 2024.
[837] USDA, FAS, *Grain and Feed Annual: Thailand*, March 13, 2020, 5; Rerkasem, “The Rice Value Chain,” January 2017, 4.
[838] Hypermarkets, or big-box stores, combine the retail offerings of a grocery store with that of a department store; Sowcharoensuk, *Thailand Industry Outlook 2023–2025,* June 2023, 7; *Thailand Industry Outlook 2019 – 2021,* August 2019, 3.
[839] Promkhambut et al., “Rethinking Agrarian Transition in Southeast Asia through Rice Farming in Thailand,” September 1, 2023, 2; USDA, FAS, *Grain and Feed Annual: Thailand*, March 22, 2024, 5, 6; Cramb, *White Gold: The Commercialization of Rice Farming in the Lower Mekong Basin*, 2020, 11–12.

After curtailing its paddy-pledging program in 2014, Thailand largely reduced its publicly held stocks of rice, resulting in smaller total stocks from MY 2018/19 to MY 2023/24 (table 6.7).[840] Most rice stocks are privately held, and a minor amount is secured through the ASEAN Plus Three Emergency Rice Reserve (APTERR) stocks, which are used for disaster relief.[841] The use of rice for further processing (e.g., animal feed, rice flour, rice snacks, and biomass electricity) declined by 5 percent between 2018 and 2023, mostly because of decreased stocks of cheap, low-quality rice leftover from the 2011–14 Paddy Pledging Program.[842]

Trade

Thailand is a major global supplier of rice. Of the world's top 10 rice producers, Thailand positions itself as the most export-oriented, averaging 38 percent of production exported from MY 2018/19 to MY 2023/24 (table 6.9).[843] Thailand supplies a geographically diverse array of markets that demand different varieties of rice, with Indonesia, South Africa, Iraq, the United States, and China being its top five export destinations in 2023 (table 6.10). Indonesia and Iraq negotiated with Thailand to import low-cost long grain white rice to support domestic food security.[844] Thailand's trade flows to these two markets fluctuated significantly on the basis of these contracts, peaking in 2022 for Iraq and 2023 for Indonesia (tables 6.10 and 6.11).[845] China and the United States are important markets for higher-value Hom Mali and glutinous rice, whereas South Africa purchases parboiled rice almost entirely from Thailand.[846] Japan is another significant market, importing mostly long grain white rice for food processing under its Minimum Access quota.[847] Thai exports reached a low point in 2020 because of severe drought in

[840] From 2011 to 2014, Thailand expanded its paddy pledging program intending to accomplish two objectives: (1) to raise the price paid to rice farmers by requiring government purchases at prices roughly 50 percent higher than the prevailing market price, and (2) to raise the international price for rice by reducing the level of Thai exports. Owing to the generous rates vis-à-vis market prices, farmers forfeited large volumes of rice, resulting in a massive buildup of government stocks eventually leading to the 2011–14 program's cancelation. USITC, *Rice*, April 2015, 206-209.
[841] USDA, FAS, *Grain and Feed Annual: Thailand*, March 22, 2024, 7; industry representative, interview by USITC staff, Thailand, June 12, 2024; government representative, interview by USITC staff, June 13, 2024.
[842] Sowcharoensuk, *Thailand Industry Outlook 2019 - 2021*, August 2019, 3; *Thailand Industry Outlook 2023 - 2025*, June 2023, 6–7.
[843] For reference, consult chapter 3, table 3.6. Of the top 10 rice producing countries, Thailand has the second-highest exports-to-production ratio behind Pakistan, but Thai production is double that of Pakistan.
[844] The Philippines also sources low-cost white rice from Thailand for its food security programs, but this is done through the private sector rather than a single government agency or contractor. S&P Global, Total exports, Thailand Tariff Line: 1006.30.90, accessed August 15, 2024; Thomas, Storey, and Fox, "Iraq Emerges to Dominate Thai White Rice Market so Far in 2022," May 24, 2022; industry representative, interview by USITC staff, Thailand, June 14, 2024; industry expert, interview by USITC staff, November 19, 2024.
[845] Notable increases in Thai exports to Indonesia coincided with droughts in that destination in 2018 and 2023. USDA, FAS, *Grain and Feed Annual: Thailand*, March 22, 2024, 7; USDA, FAS, *Grain and Feed Annual: Thailand*, March 15, 2018, 8; USDA, FAS, *Grain: World Markets and Trade*, December 2024, 1.
[846] Senegal and Cameroon are also major destinations for Thai parboiled rice. S&P Global, Total exports, Thailand Tariff Line: 1006.30.91, accessed various dates; Rerkasem, "The Rice Value Chain," January 2017, 6.
[847] Japanese food manufacturers often process imported Thai rice into noodles. Industry representative, interview by USITC staff, November 21, 2024.

northern and central Thailand that most adversely affected its dry season production and, by extension, its long grain white rice exports.[848]

Table 6.10 Thailand: exports of rice, by trade partner, 2018–23
In thousands of metric tons.

Trade Partner	2018	2019	2020	2021	2022	2023
Indonesia	823	61	89	75	92	1,411
South Africa	779	727	673	793	775	885
Iraq	29	86	24	257	1,600	854
United States	506	560	672	576	652	706
China	1,004	471	381	633	752	472
Philippines	1,032	328	80	146	186	420
Malaysia	475	293	73	154	132	402
Japan	223	267	258	292	315	337
Senegal	169	202	107	146	232	282
Cameroon	415	534	274	270	204	200
All others	5,778	4,055	3,102	2,924	2,756	2,777
Total	11,232	7,584	5,733	6,266	7,695	8,748

Source: S&P Global, Total exports, HS heading 1006, rice, accessed August 2, 2024.

Table 6.11 Thailand: exports of rice, by trade partner, 2018–23
In thousands of dollars.

Trade Partner	2018	2019	2020	2021	2022	2023
Indonesia	367,834	38,896	71,749	37,423	42,572	730,020
United States	544,838	620,854	696,397	499,851	538,328	629,321
South Africa	325,515	296,468	317,290	345,466	316,210	451,140
Iraq	11,295	34,056	9,896	124,801	651,118	415,927
China	548,050	302,010	271,660	323,505	386,542	309,789
Philippines	405,150	125,117	36,357	61,521	73,754	210,641
Malaysia	192,905	116,539	35,653	65,403	55,140	206,572
Japan	92,832	111,331	115,649	138,072	129,469	167,193
Hong Kong	194,447	189,281	189,103	155,272	143,859	142,183
Senegal	66,756	94,405	49,050	59,496	96,552	132,800
All others	2,884,657	2,270,837	1,910,338	1,596,874	1,506,694	1,705,225
Total	5,634,279	4,199,792	3,703,142	3,407,685	3,940,238	5,100,812

Source: S&P Global, Total exports, HS heading 1006, rice, accessed August 2, 2024.

Once the world's leading rice exporter, Thailand has fallen to second after India, whose exports outpaced Thailand's every year between 2018 and 2023.[849] Vietnam has also emerged to rival Thailand's global position by increasing its share of rice shipments by 7 percentage points over the same time frame.[850] As a result, Thailand's global share of rice exports has fallen from 25 percent to 16 percent; India's and Vietnam's shares increased from 27 to 34 percent and from 6 to 13 percent, respectively.[851]

Thailand's rice trade is segmented by the variety being traded. In 2023, Thailand shipped mostly long grain white rice (56 percent) followed by a combination of jasmine, Hom Mali, and other fragrant

[848] USDA, FAS, *Drought Update*, May 20, 2020, 1; USDA, FAS, *Commodity Intelligence Report*, October 1, 2021, 2.
[849] India's rice exports have outpaced Thailand's every year since 2011, which coincided with Thailand implementing its aforementioned paddy pledging program. S&P Global, Total exports, HS heading 1006, rice, accessed August 30, 2024.
[850] For reference, consult chapter 2, table 2.5.
[851] For reference, consult chapter 2, table 2.5.

varieties (25 percent), parboiled rice (16 percent), and glutinous rice (3 percent).[852] Demand for long grain white and broken rice is more commoditized where its primary competitor, Vietnam, is more often price competitive in the global market.[853] When observing international benchmark prices, the Thai 5 percent broken white rice price averaged $34.30/ton (8 percent) higher than its Vietnamese counterpart from 2018 to 2023.[854] For lower quality (25 percent broken) white rice, Thai product was also more expensive, trading $43.11/ton (11 percent) higher on average over the same period.[855] Thailand's relatively low yields and high costs of production for these varieties make it less competitive in markets that demand lower cost long grain white rice.[856] On the other hand, Thailand is the primary supplier of jasmine rice to markets in North America, East Asia, and Oceania.[857] The returns to producers of jasmine varieties exceed the drawbacks imposed by their relatively low yields, particularly for Hom Mali rice.[858] The Thai industry remains focused on growing its jasmine rice exports to high-income markets amid growing difficulty to compete in the commoditized rice markets.[859]

India's exports compete less directly with those from Thailand given differences in quality and variety traded, whereas exports from Vietnam are more competitive with these factors.[860] However, India's export restrictions on certain rice, starting in 2023, led to greater demand and attractive prices for other global suppliers, including Thailand.[861] Those export restrictions allowed for an increase in sales of lower-cost Thai rice (broken and long grain white rice) that otherwise would not have been price competitive with Indian product.[862] This ability to compete helped reverse a steady decline in Thailand's long grain white rice exports and supported the rebound to several destinations during 2022–23, including South Africa, the Philippines, Malaysia, and Senegal (table 6.10).[863]

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852 These figures consider only milled rice (HS subheading 1006.30). Government official, email to USITC, June 13, 2024.
853 Industry representative, interview by USITC staff, Thailand, June 12, 2024; industry representative, interview by USITC staff, Thailand, June 14, 2024.
854 FAO, "FPMA Tool," accessed October 2, 2024.
855 FAO, "FPMA Tool," accessed October 2, 2024.
856 Government official, interview by USITC staff, Thailand, June 13, 2024; industry representative, interview by USITC staff, Thailand, June 14, 2024.
857 Industry representative, interview by USITC staff, Thailand, June 14, 2024; industry representative, interview by USITC staff, Thailand, June 12, 2024.
858 Industry representative, interview by USITC staff, Thailand, June 12, 2024; government official, interview by USITC staff, Thailand, June 13, 2024; Cramb, *White Gold: The Commercialization of Rice Farming in the Lower Mekong Basin*, 2020, 44.
859 Industry representative, interview by USITC staff, Thailand, June 12, 2024; government official, interview by USITC staff, Thailand, June 13, 2024.
860 Industry representative, interview by USITC staff, Thailand, June 17, 2024; industry representative, interview by USITC staff, Thailand, June 12, 2024.
861 By one estimate, India's rice policy actions removed 6 million mt of rice from the global market. Industry representative, interview by USITC staff, Thailand, June 12, 2024; USDA, FAS, *Grain: World Markets and Trade*, September 2023.
862 In 2023, Thai exports of broken rice (HS subheading 1006.40) and long grain white rice (Thailand Tariff Line 1006.30.99) both increased by 27 percent. S&P Global, Total exports, HS subheading 1006.40, broken rice, accessed September 26, 2024; S&P Global, Total exports, Thailand Tariff Line: 1006.30.99, accessed September 26, 2024; industry representative, interview by USITC staff, Thailand, June 14, 2024.
863 The increase of exports to South Africa was mostly driven by parboiled rice, but this increase did not offset year-over-year declines in Thai parboiled rice exports to the world. S&P Global, Total exports, Thailand Tariff Line: 1006.30.91, accessed September 26, 2024.

Industry Structure

Thai rice farms tend to be small and fragmented. In 2022, land for rice production encompassed 43 percent of Thailand's total agricultural land use, or approximately 10.3 million hectares, and was relatively unchanged since 2018.[864] Rice farm size across Thailand averages less than 3 hectares, which is slightly smaller than in 1980, demonstrating that fragmentation rather than consolidation has taken place among Thai producers.[865] Some larger farms (up to 80 hectares) are found in Thailand's central region, but these do not predominate even in this region as the average central region farm size is a little over 3 hectares.[866] The northeastern and northern regions are characteristic of Thailand as a whole (3 or fewer hectares).[867] Overall, rice farming has shown no signs of transitioning to larger, more efficient landholdings. Unlike some other Southeast Asian rice producers, Thailand has developed into an upper-middle income economy where agriculture's share of GDP has gradually decreased since 1975, and rice's role as a development catalyst has declined as Thailand's services and industrial sectors have become more important sources of economic growth.[868]

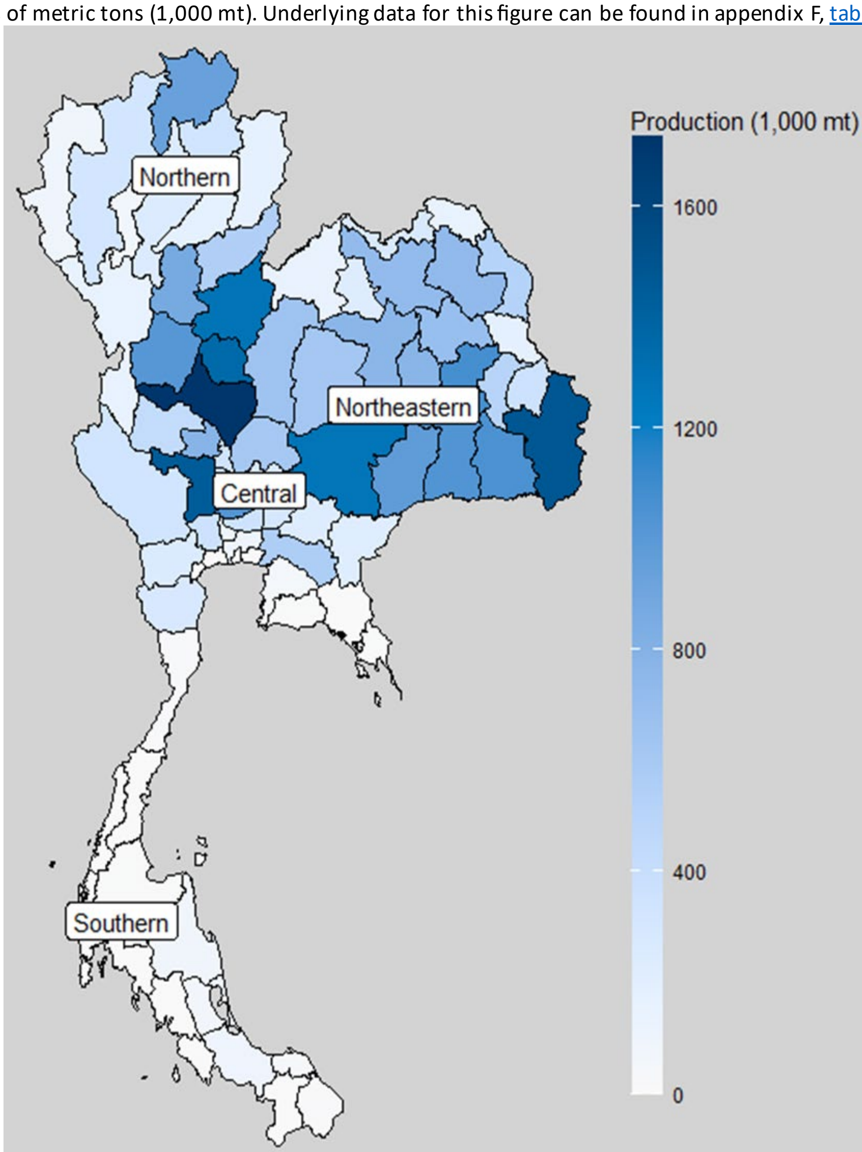
Northeastern, northern, and central Thailand are the country's major rice producing regions. Northeastern Thailand accounted for 42 percent of the country's rice crop in 2023 (figure 6.2).[869] Northern and central Thailand make up almost the entire remainder of 32 and 25 percent, respectively, in the same period.[870] Northern and central Thailand also tend to have higher yields per hectare than the northeast, regardless of wet or dry season.[871] Generally, central and northern farmers are more diversified in their rice selection, opting for higher yielding jasmine (e.g., PTT1) and long grain white rice varieties that are more receptive to inorganic fertilizers and irrigation (as opposed to the northeast's almost entirely rainfed crop) and can be grown year-round (i.e., photoperiod insensitive).[872] This results in some provinces within these two regions being able to produce two or three crops per year,

[864] Government of Thailand, Office of Agricultural Economics, *Agricultural Statistics of Thailand 2023*, March 2024, 170.
[865] Government official, interview by USITC staff, Thailand, June 13, 2024; Promkhambut et al., "Rethinking Agrarian Transition in Southeast Asia through Rice Farming in Thailand," September 1, 2023, 6; Rigg et al., "More Farmers, Less Farming?," July 1, 2018, 329.
[866] This estimate was converted from acres. Industry representative, interview by USITC staff, Thailand, June 12, 2024; Promkhambut et al., "Rethinking Agrarian Transition in Southeast Asia through Rice Farming in Thailand," September 1, 2023, 6.
[867] Northeastern Thailand had the most land dedicated to rice farming among Thailand's regions in 2022. Industry representative, interview by USITC staff, Thailand, June 12, 2024; Government of Thailand, Office of Agricultural Economics, *Agricultural Statistics of Thailand 2023*, March 2024, 170.
[868] Industry expert, interview by USITC staff, Thailand, June 13, 2024; Rigg et al., "More Farmers, Less Farming?," July 1, 2018, 327, 329.
[869] Government of Thailand, Office of Agricultural Economics, *Agricultural Statistics of Thailand 2023*, March 2024, 7, 20.
[870] The South of Thailand produced about 2 percent of the 2023 total. Government of Thailand, Office of Agricultural Economics, *Agricultural Statistics of Thailand 2023*, March 2024, 7, 20.
[871] Government of Thailand, Office of Agricultural Economics, *Agricultural Statistics of Thailand 2023*, March 2024, 6, 19.
[872] Suwanmontri, Kamoshita, and Fukai, "Recent Changes in Rice Production in Rainfed Lowland and Irrigated Ecosystems in Thailand," January 2, 2021, 15, 20, 21; Sowcharoensuk, *Thailand Industry Outlook 2023 - 2025*, June 2023, 6.

depending on the water supply.[873] However, long grain white rice has the lowest farmgate prices within Thailand.[874] To ensure profitability, these farms in the central region depend on yields, which requires scaling up high-cost inputs, like labor, fertilizer, and machinery.[875]

Figure 6.2 Thailand: rice production by region, 2023

In thousands of metric tons (1,000 mt). Underlying data for this figure can be found in appendix F, table F.21.



Source: Compiled by the USITC. Government of Thailand, Office of Agricultural Economics, *Agricultural Statistics of Thailand 2023,* March 2024.

Thailand's small average farm size impedes some possible improvements to national rice productivity. Higher mechanization rates could introduce productivity gains, but technology adoption is often more

[873] Industry representative, interview by USITC staff, Thailand, June 14, 2024.
[874] Government of Thailand, Office of Agricultural Economics, "Table 3: Agricultural Price at the farm gate," August 20, 2024; Napasintuwong, *Rice Economy of Thailand*, January 2019, 17.
[875] Cramb, *White Gold: The Commercialization of Rice Farming in the Lower Mekong Basin*, 2020, 44; Rerkasem, "The Rice Value Chain," January 2017, 2, 17.

financially difficult for the average-sized Thai rice farm.[876] Mechanization rates in land preparation, rice planting, and harvesting have increased since 2000, but significant differences remain between regions. Central Thailand uses large tractors, broadcast seeding machinery, and combine harvesters at a much higher rate than the northeast.[877] This trend partly underscores the importance of improving yields for growing long grain white rice as opposed to Hom Mali. Mechanization is also important for labor replacement, given the average age of a Thai rice farmer in 2024 is estimated to be 60 years old and Thailand's relatively high costs of labor.[878] Land represents the most tangible asset for many Thai rice farmers who need the financial safety net of using the land for rice production.[879] In addition, government policies to enhance cooperative linkages with input suppliers and downstream processors have largely stalled.[880] These factors discourage farm consolidation, which could otherwise increase on-farm mechanization rates. As a result, Thai rice farms remain fragmented, similar to other regional producers.[881]

Hom Mali producers are concentrated in Thailand's northeastern provinces and face different market conditions. Only a fraction of the northeast's paddy land is irrigated, despite longstanding industry interest in diverting water from the Mekong to increase yields and protect against adverse climate impacts.[882] The northeast lags other regions in its rate of production. In this region, farmers opt for Hom Mali because it is more resistant to the region's fluctuations in rainfall, and it commands higher farmgate and export prices than other jasmine and white rice varieties, boosting its producers' returns and mitigating the risk of higher input prices.[883] In addition, Hom Mali's reputation for consistent cooking quality and unique aromatic flavors stem from its relative geographic isolation, which helps prevent cross contamination with other rice varieties from harvest to packaging.[884] Meanwhile, Hom Mali's unique aroma and flavor come from its adaptation to the northeast's soils, which distinguish its flavor and "softer" texture when cooked from other jasmine varieties found in Southeast Asia.[885]

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[876] Industry representative, interview by USITC staff, Thailand, June 12, 2024; government representative, interview by USITC staff, Thailand, June 13, 2024; industry representative, interview by USITC staff, Thailand, June 14, 2024.
[877] Industry representative, interview by USITC staff, Thailand, June 12, 2024; Promkhambut et al., "Rethinking Agrarian Transition in Southeast Asia through Rice Farming in Thailand," September 1, 2023, 9.
[878] Consult chapter 3, table 3.3 for cross-country comparisons of labor as a share of costs of production. Industry representative, interview by USITC staff, Thailand, June 12, 2024; government representative, interview by USITC staff, Thailand, June 13, 2024; industry representative, interview by USTIC staff, Thailand, June 14, 2024; Rigg et al., "More Farmers, Less Farming?," July 1, 2018, 331.
[879] Rigg et al., "More Farmers, Less Farming?," July 1, 2018, 333.
[880] Industry representative, interview by USITC staff, Thailand, June 14, 2024; industry representative, interview by USITC staff, Thailand, June 12, 2024; Promkhambut et al., "Rethinking Agrarian Transition in Southeast Asia through Rice Farming in Thailand," September 1, 2023, 10–11.
[881] Industry representative, interview by USITC staff, Thailand, June 14, 2024; Thepent and Chamsing, *Agricultural Mechanization Development in Thailand*, October 14, 2009, 7.
[882] Industry representative, interview by USITC staff, Thailand, June 12, 2024.
[883] Government of Thailand, Office of Agricultural Economics, "Table 3: Agricultural Price at the Farm Gate," August 20, 2024; Thai Rice Exporters Association, "Average FOB Prices 2023," accessed August 28, 2024.
[884] Vanavichit et al., "Thai Hom Mali Rice," April 9, 2018, 2, 3**;** industry representative, interview by USITC staff, Thailand, June 12, 2024; government official, interview by USITC staff, Thailand, June 13, 2024.
[885] Gaur et al., "Understanding the Fragrance in Rice," January 26, 2016, 2; Vanavichit et al., "Thai Hom Mali Rice," April 9, 2018, 2-3; WIPO, "Thai Hom Mali Rice: A World-Recognized GI," February 10, 2023.

Regardless of the type of rice grown, labor remains the primary input cost associated with rice farming in Thailand.[886] Thailand's aging agricultural labor force requires migrant labor from neighboring countries (Cambodia, Burma, and Laos) during planting and harvest.[887] The COVID-19 pandemic resulted in Thailand closing its borders, declining legal migrant labor, and labor shortages within the rice sector.[888] In addition, Thailand's middle-income economy has pushed wages higher across all sectors, further contributing to its relatively expensive labor costs.[889]

Unlike Hom Mali, which is a differentiated product, long grain white rice requires higher yields to remain competitive in global markets. As a result, long grain white rice producers must use production inputs, especially fertilizer, more intensely.[890] Higher fertilizer prices added to these farmers' cost of production during 2018–23. Thai total farm costs vary but one estimate placed Thailand's costs of production 50 percent higher than Vietnam's in 2020. According to a subsequent estimation in 2022, Thailand's production costs had risen to 55 percent higher than Vietnam's production costs.[891] These cost pressures affect Thai competitiveness in the global long grain white rice market and help explain Thailand's diminishing global share of rice exports.

From Thailand's roughly 4 million rice farms, the supply chain significantly narrows to several hundred rice processors and around 100 exporters.[892] The central and northeastern regions contain 34 and 33 percent of the country's rice mills, respectively.[893] In Thailand, producers connect with processors through contract farming or direct selling because the role of middlemen declined after Thailand ended the 2011–14 Paddy Pledging Program.[894] Consolidation has been much more evident across the milling

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886 Consult chapter 3, table 3.3 for cross-country comparisons of labor as a share of costs of production. Napasintuwong, *Rice Economy of Thailand*, January 2019, 25.

887 United Nations Thematic Working Group on Migration in Thailand, *Thailand Migration Report 2019*, June 2020, 61.

888 Industry representative, interview by USITC staff, Thailand, June 14, 2024; BIS, *Labour Market Structure and Wage Dynamics in Thailand*, March 16, 2023, 287–89.

889 Migrant workers are excluded from many of Thailand's labor protections, including its minimum wage, but prevailing wages in Thailand are still higher than those within Vietnam, Burma, and Cambodia. In terms of costs of production, Thailand's labor costs can also be expressed as an opportunity cost, where agricultural workers forgo higher pay in other sectors of Thailand's economy, which further raises labor's estimated share. Industry representative, interview by USITC staff, Thailand, June 12, 2024; government official, interview by USITC staff, Thailand, June 12, 2024; government official, interview by USITC staff, Thailand, June 13, 2024; Rattanaprateeptong, *Foreign Labor in the Thai Agricultural Sector*, October 18, 2020, 4; United Nations Thematic Working Group on Migration in Thailand, *Thailand Migration Report 2019*, June 2020, 38; Cramb, *White Gold: The Commercialization of Rice Farming in the Lower Mekong Basin*, 2020, 44.

890 Kookkaew, "Cost and Return on Investment from Rice RD41 Farming," June 24, 2019, 79; Cramb, *White Gold: The Commercialization of Rice Farming in the Lower Mekong Basin*, 2020, 44.

891 *Bangkok Post*, "Hard Days Ahead for Rice," June 8, 2020; Hutasingh, "Thailand to Push for Fairer Rice Prices," September 4, 2022.

892 Estimates on Thailand's number of rice processors vary depending on which processing stage the rice mill or refinery is involved. Industry representative, interview by USITC staff, Thailand, June 12, 2024; industry representative, interview by USITC staff, Thailand, June 14, 2024; Sowcharoensuk, *Thailand Industry Outlook 2023 - 2025*, June 2023, 8.

893 The North and South regions contain 26 and 6 percent, respectively. Sowcharoensuk, *Thailand Industry Outlook 2023 - 2025*, June 2023, 8.

894 Cramb, *White Gold: The Commercialization of Rice Farming in the Lower Mekong Basin*, 2020, 25; industry representative, interview by USITC staff, Thailand, June 14, 2024; industry representative, interview by USITC staff, Thailand, June 14, 2024.

sector, given reportedly low capacity utilization and Thailand's high labor costs.[895] However, Thai mills gain an advantage in quality assurance, given the geographic separation of the rice varieties. This helps ensure consistency, especially for premium Hom Mali, which further extends to downstream distributors, retailers, and exporters.[896] This quality control bolsters the Thai industry's reputation for selling rice that consistently meets buyer specifications.

Government Programs

The rice industry is a significant employer in Thailand, where government policy largely focuses on supporting producer incomes.[897] Since abandoning the 2011–14 Paddy Pledging Program, the Thai government has favored less disruptive policies to assist rice farmers.[898] These previous programs negatively impacted Thailand's reputation as a reliable supplier, resulted in large stockpiles of poor quality rice, and threatened its position as the top global rice exporter.[899] Although importers remain wary of purchasing any such "old" stocks of Thai rice from this era, almost all of it was auctioned off or donated as food aid by 2023.[900] Government policy now encourages the private sector to absorb stocks, and Thailand's publicly held stocks are much smaller.[901] Incentives for private firms to hold stocks include direct payments and credit to millers, traders, and cooperatives who agree to store paddy rice for a set time frame after harvest.[902] In delaying the postharvest sale of rice, participants can sell at potentially higher prices in the future, while the government mitigates some storage costs.

Thailand subsidizes some inputs for rice farmers, offsetting costs to producers. Most of these programs entail subsidizing rice seeds, fertilizer, or crop insurance, sometimes through government and

[895] Sowcharoensuk, *Thailand Industry Outlook 2023 - 2025*, June 2023, 3; industry representative, interview by USITC staff, Thailand, June 12, 2024; industry representative, interview by USITC staff, Thailand, June 14, 2024.
[896] DNA testing on rice samples also ensures quality control, especially for export. Industry representative, interview by USITC staff, Thailand, June 12, 2024; government representative, interview by USITC staff, Thailand, June 13, 2024.
[897] Rice farming is estimated to employ about 18 million people, or about 5 million households. Green Climate Fund, "FP214," October 25, 2023; Sowcharoensuk, *Thailand Industry Outlook 2023 - 2025*, June 2023, 8.
[898] Thailand has not notified the WTO of its aggregate measure of support for rice since 2008, when it was estimated to be 9.7 percent of the total value of production, or 29.7 billion baht ($853 million). In 2016, Thailand notified the WTO that its calculated aggregate measure of support for rice was lower at 2.1 billion baht ($60.3 million), but it did not provide a total value of production estimate for rice. Conversion uses 2023 average exchange rate, where 1 USD = 34.802 baht. WTO, Committee on Agriculture, "Notification - Domestic Support: Thailand," April 14, 2014, 1, 8; "Notification - Domestic Support: Thailand," June 10, 2017, 1, 22; Internal Revenue Service, "Yearly Average Currency Exchange Rates," accessed October 17, 2024; USITC, *Rice*, April 2015, 206-209.
[899] Industry representative, interview by USITC staff, Thailand, June 12, 2024; USITC, *Rice*, April 2015, 206-209.
[900] Thai PBS World, "Eight Potential Bidders Submit Qualifications to Bid for the Old Rice," May 23, 2024.
[901] Government official, interview by USITC staff, Thailand, June 13, 2024; industry representative, interview by USITC staff, Thailand, June 12, 2024; USDA, FAS, *Grain and Feed Annual: Thailand*, March 22, 2024, 7.
[902] These programs to incentivize storage of paddy rice have occurred every year since 2018. In Thailand, these programs are administered by the Bank for Agriculture and Agricultural Cooperatives (BAAC). Government of Thailand, "Bank for Agriculture and Agricultural Cooperatives Act, B.E. 2509 (1966)," §§ 9-10, July 13, 1966; FAO, Commodity Policy Developments database (Thailand), accessed August 8, 2024.

cooperative partnerships or direct payments to producers.[903] In 2023, Thailand approved a 1,000 baht per rai ($175 per hectare) payment for up to 20 rai (3.2 hectares) to help 4.7 million rice farming households with production costs and quality improvements, totaling $1.6 billion in payments.[904] Other income support policies offer guaranteed prices in case domestic rice prices fall below a certain threshold, but unlike the private stockholding incentives, these programs were not consistently renewed on an annual basis.[905] After the 2014 Thai coup, the government has experienced repeated political instability, which has translated to stalling government support and investment in the rice sector.[906] This factor has sown skepticism among the rice industry that government goals to assist productivity improvements (e.g., infrastructure projects) can ultimately be successful.[907]

Government policies have placed less emphasis on increasing productivity than on supporting farmer incomes, as seen in the government's lack of investment in research and development of rice seed. Thailand lags other rice exporters in developing varieties that are more resilient and higher yielding, while maintaining desirable consumer qualities (cooking texture, aroma, grain appearance, etc.), which would help Thai exporters adapt to compete with Vietnam, especially in the long grain white rice market.[908] The Thai government "practically" prohibits rice seed imports for commercial use, which in turn discourages both foreign investment in seed research and potential improvements on its domestic rice varieties.[909] Furthermore, the Thai government is reliant upon paying farmers to propagate seeds for commercial production because it lacks the capacity to grow its own seeds.[910] Thailand's weak investment in genetic research results in lower access to and uptake of improved varieties.[911]

Factors Affecting Competitiveness

The relative competitiveness of Thailand's rice industry depends on the variety of rice grown. Thailand is a reliable supplier of and global leader in high-value jasmine rice. Although Thai exporters can supply diverse markets with different types of rice, they face cost pressures in the long grain white rice markets.

[903] Government official, interview by USITC staff, Thailand, June 13, 2024; government official, interview by USITC staff, Thailand, June 13, 2024; industry representative, interview by USITC staff, Thailand, June 14, 2024; industry representative, interview by USITC staff, Thailand, June 12, 2024; industry representative, interview by USITC staff, Thailand, June 14, 2024; industry expert, interview by USITC staff, Thailand, June 13, 2024; FAO, Commodity Policy Developments database (Thailand), accessed August 8, 2024.
[904] FAO, "Thailand Production Support," November 14, 2023.
[905] These policies, known as the Rice Price Guarantee Program, were enacted annually from 2019 to 2022 and are administered by the Bank for Agriculture and Agricultural Cooperatives (BAAC). Government of Thailand, "Bank for Agriculture and Agricultural Cooperatives Act, B.E. 2509 (1966)," §§ 9-10, July 13, 1966; FAO, Commodity Policy Developments database (Thailand), accessed August 8, 2024.
[906] Industry representative, interview by USITC staff, Thailand, June 12, 2024; industry expert, interview by USITC staff, Thailand, June 13, 2024.
[907] Industry representative, interview by USITC staff, Thailand, June 14, 2024; industry representative, interview by USITC staff, Thailand, June 12, 2024.
[908] Industry representative, interview by USITC staff, Thailand, June 12, 2024; government representative, interview by USITC staff, Thailand, June 13, 2024; industry expert, interview by USITC staff, Thailand, June 13, 2024.
[909] Industry representative, interview by USITC staff, Thailand, June 14, 2024; Napasintuwong, "Rice Seed System in Thailand," August 2018, ii–1.
[910] Industry representative, interview by USITC staff, Thailand, June 14, 2024.
[911] An industry representative estimates that many producers have been using the same rice seeds for the past two decades. Industry representative, interview by USITC staff, Thailand, June 12, 2024.

The benefits of Thailand's product differentiation in the jasmine rice market do not extend to its long grain white rice producers. In this segment, delivered costs have a greater impact on importer demand because these markets are more commoditized. Consequently, producers of long grain white rice face greater pressures than jasmine rice growers with respect to input costs. Furthermore, the investments made in Thailand's rice industry do not emphasize improving productivity. Reflecting a quality-over-quantity approach, Thai rice policy favors developing its jasmine rice exports over long grain white rice.

Positive Reputation in Higher-Value Markets

Thai jasmine rice is successfully marketed as a unique brand of aromatic rice, elevating Thai varieties over Vietnamese and Cambodian types that have entered the global market more recently.[912] This advantage allowed Thailand to become the first globally established jasmine rice supplier and to be used as a benchmark for comparing competitors' varieties.[913] Only certain provinces within Thailand are recognized as growing premium Hom Mali and imparting unique flavors, aromas, and appearance that consumers demand.[914] Moreover, Thailand's enforcement of quality standards for Hom Mali reinforces its reputation as a reliable exporter with longstanding relationships in high-value markets, especially in East Asia, North America, and Oceania.[915] Many of these markets recognize Hom Mali as a distinct and highly specified type of jasmine rice through conferring property right/trademark protections, as described in box 6.1.[916] Thailand's legacy coupled with strong consumer demand and a lack of a substitutable product result in Hom Mali generally having the highest farmgate prices in Thailand.[917] As a result, Hom Mali is responsible for 29 percent of Thai rice exports by value, despite contributing 16 percent of total shipments by volume on average since 2018.[918]

High Cost of Production in Long Grain White Rice Market

Thailand's long grain white rice market faces steeper export competition than its jasmine rice sector. Low cost drives import demand for this type of white rice because it often is imported to reinforce the purchasing country's rice stocks (e.g., the Philippines, Indonesia, and Iraq).[919] Although jasmine rice has

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912 Vietnam and, to a lesser extent, Cambodia began exporting significant quantities of jasmine rice in 2012 and 2013, respectively. Thailand had been the only global supplier for decades prior. Napasintuwong, *Rice Economy of Thailand*, January 2019, 27.

913 Industry representative, interview by USITC staff, Vietnam, June 17; Prom-u-thai and Rerkasem, "Rice Quality Improvement a Review," July 21, 2020, 28.

914 Vanavichit et al., "Thai Hom Mali Rice," April 9, 2018, 4.

915 Industry representative, interview by USITC staff, Thailand, June 12, 2024; industry representative, interview by USITC staff, Thailand, June 14, 2024.

916 Government of Thailand, National Bureau of Agricultural and Commodity and Food Standards, "Thai Agricultural Standard: Thai Hom Mali Rice," December 19, 2003; Vanavichit et al., "Thai Hom Mali Rice," April 9, 2018, 1; government official, interview by USITC staff, Thailand, June 13, 2024; industry expert, interview by USITC staff, Thailand, June 13, 2024.

917 During a 2019 drought, glutinous rice's farmgate prices were higher than Hom Mali's. Government of Thailand, Office of Agricultural Economics, "Table 3: Agricultural Price at the farm gate," August 20, 2024.

918 S&P Global, Total exports, HS heading 1006, rice, accessed August 29, 2024; S&P Global, Total exports, Thailand Tariff Line: 1006.30.40, accessed August 29, 2024.

919 Government official, interview by USITC staff, Thailand, June 12, 2024; industry representative, interview by USITC staff, Thailand, June 12, 2024; industry representative, interview by USITC staff, Thailand, June 14, 2024; government official, interview by USITC staff, Vietnam, June 24, 2024.

the benefit of product differentiation, long grain white rice is highly commoditized and producers' margins are more adversely affected by input costs, such as labor and fertilizer.[920] Thailand's services sector offers more competitive wages, resulting in migration from rural to urban areas and an aging farm labor force needing to be supplemented by foreign labor.[921] This drives up labor costs. Because higher productivity per hectare is necessary to be profitable in the long grain white rice segment, farmers tend to use more inorganic fertilizer, which further raises input costs and presents a risk to profitability.[922] Vietnam's emergence as an alternative supplier comes at Thailand's expense given its ability to match Thai long grain white rice specifications (cooking quality, texture, and taste) at often lower costs to its producers and at more competitive prices.[923]

Low Innovation and Lagging Investment in Rice Productivity

The Thai rice industry suffers from lagging investment. According to one industry expert, agriculture is not as important to Thailand's economic growth, which is now spurred by its services sector, raising an "existential" question of rice's overall importance in Thailand's future economy.[924] Government-led investment in the rice industry is characterized as insufficient by industry representatives and observers, and more effort is directed toward protecting producer incomes than increasing productivity—a trend that has been aggravated by Thailand's political instability since 2014.[925] Industry experts characterize Thailand's research and development for improving resiliency and yield as trailing Vietnam's efforts.[926] The Thai government also maintains restrictive import policies on rice seeds, which thwart development of newer and higher yielding varieties that would assist productivity in the commoditized long grain white rice market segment.[927] In addition to these factors, Thailand's irrigation infrastructure requires more investment to increase its supply resiliency and yields, especially for long grain white rice, its largest rice export by volume.[928]

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[920] Industry representative, interview by USITC staff, Thailand, June 12, 2024; Cramb, *White Gold: The Commercialization of Rice Farming in the Lower Mekong Basin*, 2020, 44.
[921] Government representative, interview by USITC staff, Thailand, June 12, 2024; industry expert, interview by USITC staff, Thailand, June 13, 2024; Rattanaprateeptong, *Foreign Labor in the Thai Agricultural Sector*, October 18, 2020, 6-7; Promkhambut et al., "Rethinking Agrarian Transition in Southeast Asia through Rice Farming in Thailand," September 1, 2023, 2; United Nations Thematic Working Group on Migration in Thailand, *Thailand Migration Report 2019*, June 2020, 60.
[922] Promkhambut et al., "Rethinking Agrarian Transition in Southeast Asia through Rice Farming in Thailand," September 1, 2023, 8-9; industry representative, interview by USITC staff, Thailand, June 14, 2024.
[923] Industry representative, interview by USITC staff, Vietnam, June 17, 2024; industry representative, interview by USITC staff, Thailand, June 12, 2024; industry representative, interview by USITC staff, Thailand, June 17, 2024; government official, interview by USITC staff, Vietnam, June 24, 2024; FAO, "FPMA Tool," accessed October 2, 2024.
[924] Industry expert, interview with USITC staff, Thailand, June 13, 2024; Rigg et al., "More Farmers, Less Farming?," July 1, 2018, 329.
[925] Industry representative, interview by USITC staff, Thailand, June 12, 2024; industry expert, interview by USITC staff, Thailand, June 13, 2024; industry representative, interview by USITC staff, Thailand, June 14, 2024.
[926] Industry observer, interview by USITC staff, Thailand, June 13, 2024; government official, interview by USITC staff, Thailand, June 12, 2024; government official, interview by USITC staff, Thailand, June 13, 2024.
[927] Industry representative, interview by USITC staff, Thailand, June 14, 2024; government official, interview by USITC staff, Thailand, June 13, 2024.
[928] Industry representative, interview by USITC staff, Thailand, June 14, 2024; government official, interview by USITC staff, Thailand, June 13, 2024; Napasintuwong, *Rice Economy of Thailand*, January 2019, 20–22.

China

China is the largest producer and consumer of rice, accounting for more than a quarter of global rice production and consumption. Traditionally, rice has been the primary staple food in China. Despite decreased table rice consumption due to declining population and dietary shifts, rice remains an important agricultural product.[929] Because rice self-sufficiency is a critical priority to China's food security policy, the government has continued implementing policies to boost rice production and support farm income.[930] Historically, China's rice industry consisted of many small actors involved in a long value chain. Efforts to modernize the industry have led to improved yields, stable production, and upgraded supply chain efficiencies through consolidation (see details in "Production" and "Industry Structure"). However, constraints on the availability of land, labor, and water continue to put pressure on rice production.[931]

Although trade accounts for a relatively small share of China's rice market, imports and exports have major implications for the global market because of China's large market size. In recent years, China's rice imports and exports have fluctuated on the basis of government policies and global rice market conditions, and China's projected rice stocks have accounted for a significant share of global rice stocks.[932] How China sheds its excess rice inventory, including via exports at a relatively low price in the global market, has been of interest to the global rice industry.

Production

China is the largest rice producer in the world, accounting for about 30 percent of global rice production during MY 2018/19–2023/24.[933] China produces long grain rice as well as medium and short grain rice.[934] Long grain rice accounts for roughly two-thirds of total production, and medium and short grain varieties make up the remaining production share.[935] In MY 2021/2022, Chinese rice production reached 149.0 million metric tons (MMT), the highest in recent years (table 6.12). Rice production dropped the next two years as a result of a reduced planted area, but yields have remained stable. From MY 2018/19 to MY 2023/24, rice yields averaged 7.1 mt per hectare (ha), a 3.6 percent increase compared to MY 2013/14–2017/18. Improved rice varieties and production management have contributed to steady increases in rice yields.[936] Despite a lack of increase in harvested area due to competition for land from other crops and urban development, these rising yields have kept rice production relatively steady (table 6.12).

[929] USDA, FAS, *Grain and Feed Annual: China - People's Republic Of*, April 2, 2024, 24. USDA, FAS, *Grain and Feed Annual: China - People's Republic Of*, April 6, 2022, 17; industry representative, interview by USITC staff, August 6, 2024.
[930] USDA, FAS, *Grain and Feed Annual: China - People's Republic Of*, April 2, 2024, 27–28.
[931] Deng et al., "Closing Yield Gaps for Rice Self-Sufficiency in China," April 12, 2019, 2.
[932] USDA, FAS, PSD Online database, accessed October 8, 2024.
[933] USDA, FAS, PSD Online database, accessed October 8, 2024.
[934] Production share of short grain indica varieties is minimal.
[935] USDA, FAS, *New to China Market Product Report - Rice*, June 5, 2020, 2; government official, interview by USITC staff, September 23, 2024.
[936] USDA, FAS, *Grain and Feed Update: China - People's Republic Of*, July 6, 2018, 22; USDA, FAS, *Grain and Feed Annual: China - People's Republic Of*, April 4, 2018, 22.

Table 6.12 China: rice production, consumption, stocks, and trade, marketing years 2018/19–2023/24
In metric tons (mt), hectares (ha), kilograms (kg), metric tons per hectare (mt/ha), and percentages (%).

Attribute	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
Beginning stocks (1,000 mt)	109,000	115,000	116,500	116,500	113,000	106,600
Production (milled) (1,000 mt)	148,490	146,730	148,300	148,990	145,946	144,620
Area harvested (1,000 ha)	30,189	29,690	30,076	29,921	29,450	28,949
Yield (rough) (mt/ha)	7.0	7.1	7.0	7.1	7.1	7.1
Imports (1,000 mt)	3,200	2,600	4,215	5,949	4,384	1,527
Consumption and residual (1,000 mt)	142,920	145,230	150,293	156,360	154,994	148,115
Exports (1,000 mt)	2,770	2,600	2,222	2,079	1,736	1,632
Ending stocks (1,000 mt)	115,000	116,500	116,500	113,000	106,600	103,000
Exports-to-production ratio (%)	1.9	1.8	1.5	1.4	1.2	1.1
Ending stocks-to-use ratio (%)	78.9	78.8	76.4	71.3	68.0	68.8
Per capita consumption (kg)	101.9	103.2	106.5	110.7	109.8	105.0

Source: USDA, FAS, PSD Online database, accessed September 13, 2024; World Bank, Data: Population, accessed September 13, 2024.
Note: Per capita consumption was calculated using marketing year apparent consumption divided by calendar year population. All other data, including imports and exports, are based on the marketing year.

Consumption and Stocks

China is the largest rice consumer in the world. During MY 2018/19–2023/24, China accounted for approximately 30 percent of global consumption.[937] In that period, total apparent consumption grew more than 0.8 percent annually on average (table 6.12).[938] The record levels of rice consumption in MY 2021/22 are attributable to the increased use of rice for feed due to high corn prices.[939] Despite higher total rice consumption, per capita rice consumption, excluding feed use, has been declining. An aging population and a diet shift among young urban Chinese, who prefer less rice and more Western-style wheat-based foods, have contributed to lower per capita rice consumption.[940]

Because food security, and specifically self-sufficiency, is an important goal for the Chinese government, grain storage (rice stocks) is an important policy measure. Rice stocks involve national (state), local (provincial), and commercial reserves; actual rice stock levels, considered a state secret, are not publicly available.[941] Reported stocks from official USDA data, which are reported in table 6.12, are derived as residual from a food balance equation and may not reflect annual changes in actual stock levels.[942] Despite China's ending stocks appearing to have decreased in three consecutive years since MY 2020/21, China has had a relatively high ending stocks-to-use ratio (table 6.12).

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[937] USDA, FAS, PSD Online database, accessed October 8, 2024.
[938] Apparent consumption includes consumption for table rice, rice used as animal feed, rice used in industry for various food and non-food manufacturing as an ingredient.
[939] USDA, FAS, *Grain: World Markets and Trade*, April 2022, 10.
[940] USDA, FAS, *Grain and Feed Annual: China - People's Republic Of*, April 6, 2022, 17; industry representative, interview by USITC staff, August 6, 2024.
[941] Several agencies such as Food and Agriculture Organization, International Grains Council, and USDA report different estimates for China's grain stocks. This is because data on actual stock levels are unavailable and grain use data are incomplete. Deuss and Adenäuer, *China's Grain Reserves, Price Support and Import Policies*, February 4, 2020, 13.
[942] Estimation is based on an equilibrium in which supply, which includes beginning stocks, production, and imports, must equal demand, which includes use, exports, and ending stocks.

Trade

Historically, China's domestic rice production has met domestic rice demand with little need for rice imports. Thus, imports have accounted for a smaller share (usually less than 5 percent) of China's domestic rice supply (table 6.12). However, because of China's large market size, its imports play a significant role in the global rice market. China has primarily imported milled long grain rice, most of which has traditionally come from neighboring Southeast Asian countries.[943]

China administers a tariff-rate quota (TRQ) system, which is intended to limit rice imports.[944] Limited quantities of in-quota rice enter the country at a lower rate (1 percent), although imports beyond the limit (out-of-quota) are assessed at a higher tariff rate of 65 percent. The annual rice quota of 5.32 MMT is evenly split between medium and short grain (medium-short grain) rice and long grain rice.[945] Quota allocations are also split evenly between private allocations and state-owned enterprise (SOE) allocations.[946] Imports of long grain broken rice and medium-short grain broken rice are included in total rice TRQs.[947] Long grain TRQ allocations are competitively filled mostly from South Asian and Southeast Asian countries, and medium-short grain TRQ allocations have remained largely unfilled in recent years.[948] Relative to China's domestic prices, Vietnam and Thailand's export prices to China have been generally price competitive.[949] However, major medium-short grain producers in Asia, such as Japan and South Korea, have higher domestic prices than China.[950]

During MY 2018/19–2023/24, China imported an average of 3.6 MMT of rice (table 6.12).[951] In MY 2021/22, China's rice imports totaled almost 6 MMT, exceeding the rice TRQ volume of 5.32 MMT and accounting for more than 10 percent of global imports.[952] This overage was all in long grain rice; long grain imports exceeded long grain TRQ allocations from MY 2020/21 to MY 2021/22. The increased

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[943] Currently, Russia is the only country with Bilateral Phytosanitary Protocols that allow paddy (rough) rice exports to China. USDA, FAS, *Grain: World Markets and Trade*, July 2021, 10.

[944] China agreed to open its rice market through a TRQ as part of its WTO accession. Increasing total quota allotments were phased in each year until 2004. Deuss and Adenäuer, *China's Grain Reserves, Price Support and Import Policies*, February 4, 2020, 15; Glauber and Lester, "China–Tariff Rate Quotas for Certain Agricultural Products. Against the Grain: Can the WTO Open Chinese Markets? A Contaminated Experiment," October 2021, 405.

[945] China's classification of rice differs from Codex Alimentarius (Codex) international standards on long, medium, and short grain. Instead, China has two categories: long grain rice and "others," which includes medium and short grain varieties. USDA, FAS, *Grain and Feed Annual: China - People's Republic Of*, April 2, 2024, 30; Codex Alimentarius, "Standard for Rice," 2019.

[946] USDA, FAS, *Grain and Feed Annual: China - People's Republic Of*, April 2, 2024, 29–30.

[947] USDA, FAS, *Grain and Feed Annual: China - People's Republic Of*, April 2, 2024, 29–30.

[948] USDA, FAS, *Grain: World Markets and Trade*, February 2020, 9; USDA, FAS, *Grain: World Markets and Trade*, January 2022, 10.

[949] USDA, FAS, *Grain and Feed Annual: China - People's Republic Of*, April 4, 2017, 23; USDA, FAS, *Grain and Feed Annual: China - People's Republic Of*, April 4, 2018, 24.

[950] Choi, Dyck, and Childs, *The Rice Market in South Korea*, September 2016, 24.

[951] USDA, FAS, PSD Online database, accessed October 8, 2024.

[952] Imports from the USDA, FAS, PSD Online database are based on marketing year data whereas data from table 6.13 are calendar year data.

imports were primarily of broken rice from India and Pakistan for feed use, as well as milled long grain rice from Pakistan.[953]

Thailand and Vietnam are still major suppliers of milled long grain rice, but imports from countries such as India, Burma, and Pakistan grew in some years (table 6.13).[954] Notably, broken rice imports from these three countries accounted for a larger import share in the last several years.[955] This surge of imports was due to competitive prices in broken rice for feed use.[956] As China's domestic corn prices were increasing, rice—domestic and imported—substituted for corn as a feedstock.[957] Before MY 2020/21, broken rice imports accounted for approximately 20–25 percent of total imports.[958] As the use in feed increased, broken rice accounted for approximately half of total rice imports in MY 2020/21 and MY 2021/22.[959]

Table 6.13 China: imports of rice, by trade partner, 2018–23

In thousands of metric tons. ** = rounds to zero.

Trade partner	2018	2019	2020	2021	2022	2023
Vietnam	1,452	479	788	1,076	858	935
Burma	77	546	911	795	799	541
Thailand	899	526	325	600	768	462
India	**	1	4	1,089	2,180	242
Cambodia	163	225	233	301	292	209
Pakistan	342	604	475	962	1,197	181
Laos	74	73	75	29	43	27
Japan	**	1	1	1	1	**
All others	30	49	100	70	21	**
Total	3,037	2,503	2,911	4,923	6,159	2,598

Source: S&P Global, General imports, HS heading 1006, rice, accessed August 2, 2024.

[953] USDA, FAS, *Grain: World Markets and Trade*, February 2023, 9; USDA, FAS, *Grain: World Markets and Trade*, April 2022, 10.

[954] Before China's reclassification of long grain rice as glutinous rice in 2018, which increased out-of-quota tariff rates from 5 percent to 50 percent for Association of Southeast Asian Nations (ASEAN) suppliers, Vietnam was a major glutinous rice supplier to China. Since then, glutinous rice exports to China have decreased significantly. USDA, FAS, *Grain: World Markets and Trade*, February 2020, 9; USDA, FAS, *Grain and Feed Update: China—People's Republic Of*, September 26, 2018, 19.

[955] S&P Global, General imports, HS heading 1006, rice, September 1, 2024.

[956] USDA, FAS, *Grain: World Markets and Trade*, April 2022, 10

[957] USDA, FAS, *Rice Prices and Domestic Demand Shape Trade Landscape*, October 15, 2021, 1–4.

[958] S&P Global, General imports, HS heading 1006, rice, September 1, 2024.

[959] USDA, FAS, *Grain: World Markets and Trade*, April 2022, 10; S&P Global, HS heading 1006, rice, accessed various dates.

Table 6.14 China: imports of rice, by trade partner, 2018–23
In thousands of dollars.

Trade partner	2018	2019	2020	2021	2022	2023
Vietnam	740,025	240,743	451,874	535,492	437,183	543,204
Thailand	508,028	345,445	242,324	340,176	419,973	298,376
Burma	31,524	203,625	323,905	297,585	313,997	224,731
Cambodia	122,879	171,535	158,444	192,350	180,980	145,371
India	42	515	1,467	372,393	776,969	93,824
Pakistan	145,363	234,869	187,150	399,032	455,411	80,572
Laos	37,962	34,776	52,273	16,210	25,551	19,978
Japan	1,880	3,572	2,930	2,236	2,353	1,135
All others	12,494	18,374	38,604	31,636	9,820	389
Total	1,600,197	1,253,454	1,458,970	2,187,109	2,622,238	1,407,580

Source: S&P Global, General imports, HS heading 1006, rice, accessed August 2, 2024.

Since the surge of imports in those years, import levels have come down significantly. In MY 2023/24, China imported less than 2 MMT of rice, filling less than 50 percent of rice TRQ allocations (table 6.12). India's rice export restrictions, which included broken rice, lowered supply. Also, imported rice prices, relative to China's domestic rice prices, lost the price advantage they had in previous years. As China's domestic corn prices declined, the demand for rice for feed use decreased, further lowering demand for broken rice imports.[960]

China mainly exports milled medium-short grain rice, but it does not have an export-oriented rice industry.[961] Thus, exports account for a small share of China's total rice production. Rice exports in the past were low in quantity or limited to neighboring economies such as South Korea, North Korea, Japan, and Hong Kong.[962] Recently, however, exports have increased to new markets (table 6.15). In MY 2017/18, China started to develop export channels to reduce excess stocks (old-crop rice) that were procured through the minimum price support program (discussed in more detail below under "Government Programs").[963] Abundant, old-crop rice was competitively priced, leading to a surge in exports.[964] Expanded destinations included Puerto Rico, Egypt, Papua New Guinea, Türkiye, and Côte d'Ivoire (table 6.15).[965] During MY 2018/19–2023/24, China exported on average 2.2 MMT of rice (table 6.12), significantly higher than during the five years prior, when exports averaged 625,000 MT.[966] In MY 2018/19, China's rice exports totaled 2.8 MMT, making China the sixth-largest global exporter that year.

[960] USDA, FAS, *Grain and Feed Annual: China - People's Republic Of*, April 6, 2023, 23.
[961] China exports a limited quantity of husked (brown) rice, mainly to South Korea.
[962] USDA, FAS, *Grain and Feed Annual: China - People's Republic Of*, April 4, 2017, 24.
[963] After several years of storage, old-crop rice may have quality issues from excess or low humidity, and inconsistent temperature. Older stocks have been offloaded and rotated out through rice auctions for food manufacturing, feed use, and exports. USDA, FAS, *Grain and Feed Annual: China - People's Republic Of*, April 4, 2017, 24; industry representative, interview by USITC staff, August 6, 2024.
[964] The USDA reported export shipments values to some destinations corresponded to the average price of old-crop rice auctions. USDA, FAS, *Grain and Feed Annual: China - People's Republic Of*, April 4, 2018, 24–25.
[965] USDA, FAS, *Grain and Feed Annual: China - People's Republic Of*, April 4, 2018, 24–25; USDA, FAS, *Grain and Feed Update: China - People's Republic Of*, July 6, 2018, 24; USDA, FAS, *Grain and Feed Annual: China - People's Republic Of*, April 17, 2019, 16.
[966] USDA, FAS, PSD Online database, accessed October 8, 2024.

Table 6.15 China: exports of rice, by trade partner, 2018–23
In thousands of metric tons.

Trade partner	2018	2019	2020	2021	2022	2023
Türkiye	168	228	32	121	226	203
Egypt	170	446	264	250	481	170
Papua New Guinea	1	122	126	148	186	167
North Korea	44	162	1	0	75	164
South Korea	173	148	206	226	197	133
Côte d'Ivoire	450	309	99	168	64	90
Japan	73	26	62	62	61	72
Puerto Rico (U.S.)	64	63	63	84	105	63
Sudan	15	8	27	46	20	56
Mongolia	26	40	47	34	42	54
All others	905	1,196	1,378	1,309	758	454
Total	2,089	2,747	2,304	2,448	2,215	1,626

Source: S&P Global, Total exports, HS heading 1006, rice, accessed August 2, 2024.

Table 6.16 China: exports of rice, by trade partner, 2018–23
In thousands of dollars.

Trade partner	2018	2019	2020	2021	2022	2023
South Korea	121,070	110,633	153,694	186,803	181,804	116,837
Türkiye	56,523	72,940	9,641	38,338	76,968	100,864
Japan	61,456	21,760	52,429	54,175	70,040	88,001
Papua New Guinea	295	44,095	45,525	54,825	73,502	84,189
Egypt	51,161	132,477	76,160	80,130	162,926	82,340
North Korea	24,634	77,507	589	0	33,209	76,810
Puerto Rico	22,644	19,945	19,459	27,780	37,170	40,320
Philippines	43,070	10,198	38,412	48,032	27,499	39,088
Côte d'Ivoire	142,316	84,684	28,514	49,872	18,904	37,080
Pakistan	30,861	37,963	31,903	37,933	45,635	36,869
All others	333,400	446,757	459,954	457,769	306,047	282,365
Total	887,429	1,058,958	916,281	1,035,658	1,033,704	984,763

Source: S&P Global, Total exports, HS heading 1006, rice, accessed August 2, 2024.

Despite higher average exports in recent years, the pace has slowed down since MY 2018/19 (table 6.12).[967] Exports remained above 1.5 MMT, but China's exports decreased because of weakened price competitiveness relative to lower-cost long grain exporters such as India.[968] At the same time, China's old-crop rice was substituting its domestic corn as an animal feed, as described above.[969] Nevertheless, new markets such as Puerto Rico have continued to import Chinese milled rice.[970]

In addition to commercial sales, which make up the bulk of exports, China also exports rice as food aid as part of disaster and humanitarian relief efforts.[971] In 2023, official rice donations totaled $13.7 million, with El Salvador, South Sudan, and Mozambique as top recipients.[972] Recently, rice assistance under

[967] USDA, FAS, PSD Online database, accessed October 8, 2024.
[968] USDA, FAS, *Rice Prices and Domestic Demand Shape Trade Landscape*, October 15, 2021, 4.
[969] USDA, FAS, *Rice Prices and Domestic Demand Shape Trade Landscape*, October 15, 2021, 4.
[970] S&P Global, General imports, HS heading 1006, rice, September 1, 2024.
[971] USDA, FAS, *Grain and Feed Annual: China - People's Republic Of*, April 16, 2021, 11.
[972] Because donations are reported in value, not quantity, it is difficult to quantify shipments. It is also possible that all donations are not officially reported. USDA, FAS, *Grain and Feed Annual: China - People's Republic Of*, April 2, 2024, 27.

China's One Belt, One Road initiative has been limited.[973] Despite the expectations that China will export more to One Belt, One Road countries, observed exports levels to these countries have not yet been significant.[974]

Industry Structure

China's rice industry includes farms and mills of different sizes. Historically, the industry consisted of small growers and millers with limited economies of scale and a lower degree of modernization.[975] Recent decades have seen incentives for farms and mills to grow larger to take advantage of economies of scale and to improve production and milling efficiencies.[976] As a result, the rice industry has increased milled rice output despite limited or no increase in planted area (table 6.12).

As one of the major crops grown on China's 200 million farms, rice is grown in many geographic regions across different climates.[977] Southern China has a tropical climate where double-cropping is possible due to warmer weather and plentiful rainfall.[978] Double-crop early and late rice (long grain indica varieties) grow primarily in southern provinces such as Hunan, Jiangxi, Guangxi, and Guangdong (figure 6.3).[979] Double-crop rice production constitutes approximately 30 percent of China's rice production.[980] In contrast, cooler temperatures in central and northern China allow only one rice crop per year. Single-crop long grain rice grows primarily in central China around the Yangtze River. Short and medium grain rice is planted along the Yangtze River and in northeastern China (Heilongjiang, Jilin, and Liaoning provinces).[981] Single-crop rice production accounts for approximately 70 percent of China's rice production.[982]

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[973] One Belt, One Road is also known as the Belt and Road Initiative. In addition to food aid, other examples of agricultural engagement with One Belt, One Road countries include exporting hybrid rice seeds to Pakistan and providing rice extension services such rice breeding and resource management programs in Africa. Government official, interview by USITC staff, April 8, 2024.

[974] China's engagement with One Belt, One Road countries regarding rice trade has appeared relatively less commercial and more of a diplomatic one. Government official, interview by USITC staff, April 8, 2024.

[975] Duan et al., "Consolidation of Agricultural Land Can Contribute to Agricultural Sustainability in China," December 16, 2021, 1014; Xin and Li, "Rental Rates of Grain Land for Consolidated Plots and Their Determinants in Present-Day China," July 2019, 1.

[976] USDA, FAS, *Grain and Feed Update: China - People's Republic Of*, July 6, 2018, 22; Duan et al., "Consolidation of Agricultural Land Can Contribute to Agricultural Sustainability in China," December 16, 2021, 1020.

[977] Duan et al., "Consolidation of Agricultural Land Can Contribute to Agricultural Sustainability in China," December 16, 2021, 1014.

[978] Before widespread irrigation agriculture in the modern era, China's rice was mostly grown in southern China.

[979] Late indica is planted after early indica harvest, between June and July, and is harvested in November.

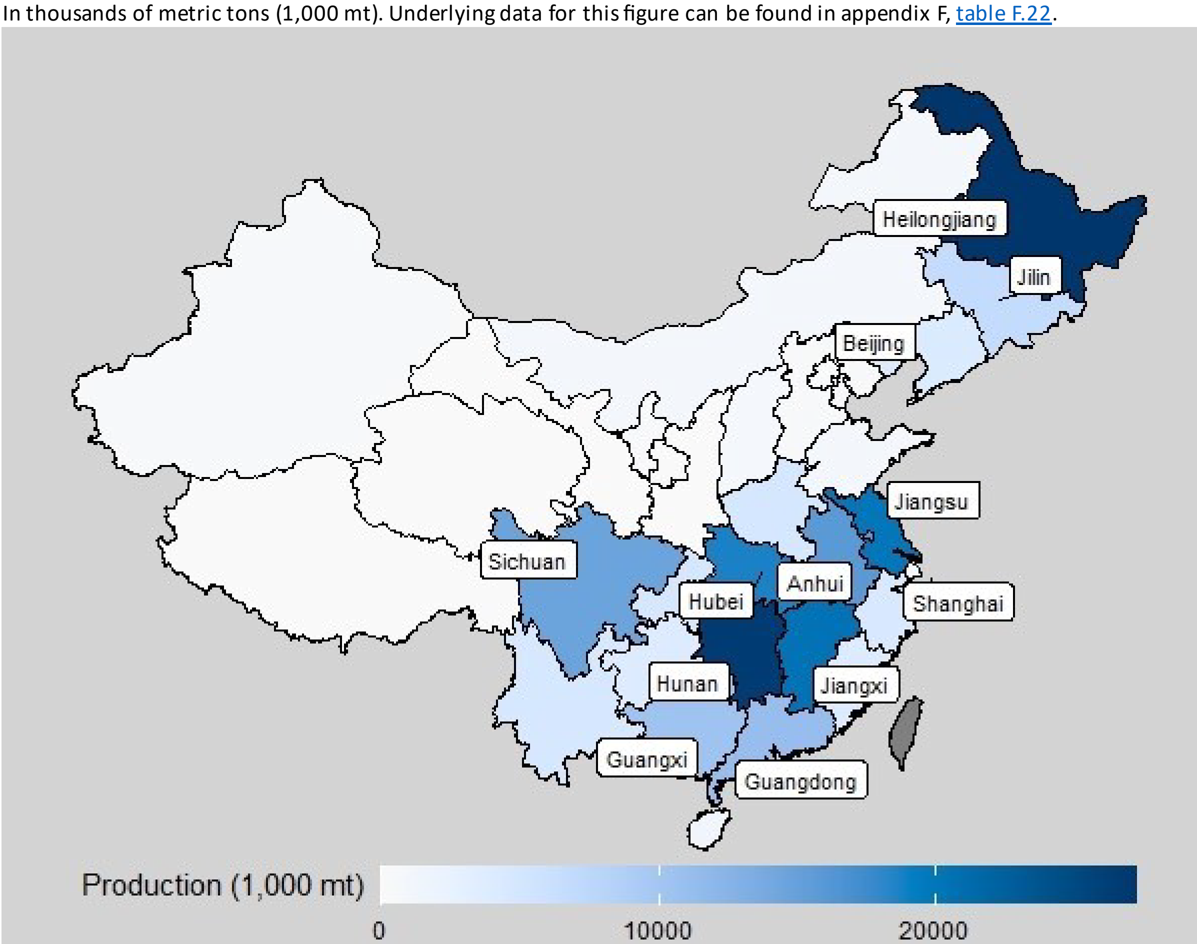
[980] USDA, FAS, "China Rice Area, Yield and Production," accessed September 1, 2024.

[981] Japonica rice grow better in temperate climates available in northern China.

[982] USDA, FAS, "China Rice Area, Yield and Production," accessed September 1, 2024.

Figure 6.3 China: rice production by province, 2022

In thousands of metric tons (1,000 mt). Underlying data for this figure can be found in appendix F, table F.22.



Source: Compiled by the USITC. National Bureau of Statistics of China, "Agriculture - Output of Major Farm Products," accessed September 30, 2024.

Rising costs and a steady increase in urbanization, particularly around the southern coastal cities, have caused rice production in the north to expand relative to the south. Northeastern China has larger farms, including state-owned farms.[983] Heilongjiang, where most large farms are located, is the largest rice-producing province (figure 6.3).[984] Heilongjiang has fertile croplands that are located in flat plains, suitable for land consolidation and large-scale farming.[985] Unlike millions of small farms throughout China that have cropland of less than 1 ha with several scattered plots, farm sizes in Heilongjiang can

[983] Forms of state farms have existed in Heilongjiang even before the establishment of the People's Republic of China in 1949. Heilongjiang was one of the major regions in China where state-owned farms were concentrated. Government official, interview by USITC staff, April 8, 2024; government official, interview by USITC staff, September 11, 2024; government official, interview by USITC staff, September 23, 2024; Zhang, "Reforming China's State-Owned Farms: State Farms in Agrarian Transition," September 2010, 367.
[984] National Bureau of Statistics of China, "Agriculture - Output of Major Farm Products," accessed September 30, 2024; USDA, FAS, "China Rice Area, Yield and Production," accessed September 1, 2024.
[985] Jiang, *Northeast China: Prospects for U.S. Agricultural Exports*, April 2014, 2; government official, interview by USITC staff, September 11, 2024.

reach thousands of hectares.[986] Central and local governments have financially supported land consolidation, and large farms have taken advantage of relatively cheaper land and have invested in modern agricultural technology to improve yields and soil resource management.[987]

Rice production in the south, compared to the north, has gained limited production efficiencies as a result of continued urbanization in southern coastal areas and lower economies of scale. Competition for labor in urban areas has caused labor costs to rise.[988] Despite the recent development of improved land rental markets, the average farm in southern provinces remains small with fragmented plots and steep slopes, limiting cropland consolidation and labor-saving technology adoption.[989] However, rice growers in the south may pool resources together to buy inputs and rent machinery from the north for harvesting, improving production efficiencies to a degree.[990]

China’s rice milling sector is composed of a few large millers and many small millers.[991] Smaller millers have low milling capacity and are likely limited to marketing rice at the local level. In contrast, larger mills, many operated by China’s state-owned enterprises (SOEs), are strategically located to facilitate grain transportation from rice-growing regions to rice-consuming regions, including cities such as Beijing and Shanghai.[992] The SOEs’ vertical integration led to consolidation and modernization of mills, and new entrants to the milling business have been few.[993] As a sector dealing with large volumes of rice with low margins, the milling industry has not been a very profitable business.[994]

China’s rice value chain is complex, with challenges of transporting harvested rice from the field to storage and milling facilities and eventually to retail markets for direct rice consumption or to industries for further processing. In recent years, however, supply chain management in China has improved significantly, as noted in chapter 3. Transportation and delivery services have become more efficient;

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[986] Zhang, “Reforming China’s State-Owned Farms: State Farms in Agrarian Transition,” September 2010, 369; Zhou and Tian, “Northeastern Province Makes Headway on Rural Front,” accessed September 30, 2024; Li, Zhang, and Hayes, “Can China’s Rural Land Policy Reforms Solve Its Farmland Dilemma?,” Winter 2018; Duan et al., “Consolidation of Agricultural Land Can Contribute to Agricultural Sustainability in China,” December 16, 2021, 1014.

[987] Zhou and Tian, “Northeastern Province Makes Headway on Rural Front,” accessed September 30, 2024; Duan et al., “Consolidation of Agricultural Land Can Contribute to Agricultural Sustainability in China,” December 16, 2021, 1017–18.

[988] Xin and Li, “Rental Rates of Grain Land for Consolidated Plots and Their Determinants in Present-Day China,” July 2019, 421, 425.

[989] Duan et al., “Consolidation of Agricultural Land Can Contribute to Agricultural Sustainability in China,” December 16, 2021, 1015; Xin and Li, “Rental Rates of Grain Land for Consolidated Plots and Their Determinants in Present-Day China,” July 2019, 422.

[990] Industry representative, interview by USITC staff, August 6, 2024.

[991] China has more than 10,000 reported mills, but this is likely underestimated given the number of local, small millers. Government official, interview by USITC staff, April 8, 2024; government official, interview by USITC staff, September 11, 2024.

[992] SOEs such as China Oil and Foodstuffs Corporation (COFCO) and Beidahuang Group are China’s biggest rice millers. One of COFCO’s biggest mills has a processing capacity of 1.5 MMT of rice per year. Southern coastal cities such as Guangzhou and Shenzhen can locally supply rice from surrounding areas in Guangdong. Government official, interview by USITC staff, September 11, 2024; Yang et al., “Rice Supply Flows and Their Determinants in China,” July 28, 2021, 4.

[993] Government official, interview by USITC staff, April 8, 2024.

[994] Government official, interview by USITC staff, April 8, 2024.

traditional wholesalers, who linked processors and retail markets, are being phased out.[995] Instead, e-commerce has allowed retailers to contract directly with processors to secure their rice products.[996] As a result, physical buyer-to-buyer marketplaces have had a decreasing role.[997]

The Chinese government plays an active role in China's industry structure. China has a “red line” minimum requirement for 1.8 billion mu (120 million hectares) of cultivated farmland, and the government has an annual grain output target of 650 MMT.[998] Following these top-level goals, central, provincial, and local governments coordinate planting decisions and state-owned farms grow rice under government guidance. SOEs are significantly involved in the entire value chain, from production, storage (including reserves), and milling, all the way to retail marketing. For example, SOE China Oil and Foodstuffs Corporation (COFCO), the biggest rice miller, also directly distributes several popular rice brands to retail markets.[999]

Government Programs

Although China has continued its transformation from an agrarian society to a major manufacturing country, agricultural policies have remained an important aspect of China’s domestic policy. According to China’s “No. 1 Central Document,” an official policy guideline on agriculture and rural development that has been issued annually for more than 20 years, safeguarding food security has been a critical priority for the Chinese government and self-sufficiency remains one of its core food security goals.[1000] Rice in particular has been considered an important food staple for which China seeks to achieve “absolute security” through domestic production.[1001] As a result, the government has implemented numerous policy measures to support and incentivize rice production. These measures include minimum support prices, rice reserves, and TRQ policies to safeguard the country’s rice supply. In 2022, China notified the WTO Committee on Agriculture that its rice-specific aggregate measure of support totaled renminbi

[995] Government official, interview by USITC staff, April 8, 2024.
[996] Government official, interview by USITC staff, April 8, 2024.
[997] Government official, interview by USITC staff, April 8, 2024.
[998] Mu is a unit of area measurement used in China; 1 mu corresponds to roughly 1/15 of a hectare, or about 666.67 square meter. Industry representative, interview by USITC staff, August 6, 2024; USDA, FAS, Top Ag Policy Document Outlines Food Security, March 12, 2024, 2, 4.
[999] Government official, interview by USITC staff, September 11, 2024.
[1000] Dong et al., *China’s Food Security: Key Challenges and Emerging Policy Responses*, March 2024, 5; Government of China, “No.1 Central Document of 2024,” January 1, 2024; USDA, FAS, *Top Ag Policy Document Outlines Food Security*, March 12, 2024, 1.
[1001] In the “No.1 Central Document,” the term “grain” refers to: rice, wheat, corn, soybeans, beans, and tubers. In addition to rice, wheat is also considered a food grain that must achieve self-sufficiency. Donnellon-May, “Understanding China’s Food Priorities For 2024,” January 6, 2024.

(RMB) 27.3 billion (approximately $4 billion), less than 5 percent of China's reported total value of rice production.[1002]

Minimum Support Price

The minimum support price (MSP) program is an important agricultural policy that supports rice production in China. Implemented in 2004 for rice, the MSP is set by the National Development and Reform Commission, which considers input costs, farm profits, and domestic and global grain markets when setting the MSP.[1003] Because MSP procurement for a given year is announced before a new crop year starts, farmers can make planting decisions knowing the minimum price they can receive.[1004] When market prices drop below the administered MSP, state-owned grain companies such as COFCO and Sinograin procure rice at the MSP in the main rice-producing regions, effectively creating a price floor.[1005]

Since the introduction of the MSP program, support levels have fluctuated. From 2004 to 2015, minimum prices paid increased, between RMB 1,400/mt (approximately $170/mt) to RMB 1,500/mt ($180/mt) in 2004 and reaching RMB 2,700/mt ($433/mt), RMB 2,760/mt ($442/mt), and RMB 3,100/mt ($497/mt) for early indica, medium and late indica, and japonica in 2015, respectively.[1006] Although MSP levels dropped steadily from 2015 to 2019, they have increased in small increments during the last five consecutive years.[1007] In addition, reduced MSP levels have been supplemented by production subsidies from the central government since MY 2017/18, further supporting production and incentivizing larger farm operations.[1008] Starting in 2015, China provided a single, direct payment for seed, fuel, and fertilizer subsidies.[1009]

[1002] Data from 2022 are the latest calendar year notification available. In addition to rice-specific aggregate measures of support, China also reported support for domestic rice industry under the WTO's "Green Box" and "Exempt Direct Payments." Both measures are exempt from the domestic support reduction commitment and are not counted in rice-specific aggregate measures of support. When joining the WTO, China committed that its product-specific support will not exceed 8.5 percent of total value of production for any basic agricultural product. WTO, Committee on Agriculture, "Notification—Domestic Support: People's Republic of China," September 27, 2024.

[1003] Kimura, Gay, and Yu, *China's Grains Policy*, May 13, 2019, 8; WTO, Committee on Agriculture, "Notification - Domestic Support: People's Republic of China," March 24, 2010; Government of China, "No.1 Central Document of 2004," December 31, 2003.

[1004] USDA, FAS, *Grain and Feed Annual: China - People's Republic Of*, April 6, 2023, 26; Kimura, Gay, and Yu, *China's Grains Policy*, May 13, 2019, 8.

[1005] Boehme, "New Grain Giant to Manage China's Reserves," August 29, 2022; Deuss and Adenäuer, *China's Grain Reserves, Price Support and Import Policies*, February 4, 2020, 14–15.

[1006] Exchange rate of USD 1 = RMB 8.27 for 2004 and USD 1 = RMB 6.24 in 2015 based on OECD data. For comparison, China's $500/ton MSP in 2015 was significantly higher than Thailand's white rice export quotes (5 percent broken) that averaged approximately $400/ton in 2015. Kimura, Gay, and Yu, *China's Grains Policy*, May 13, 2019, 9.

[1007] USDA, FAS, *Grain and Feed Annual: China - People's Republic Of*, April 2, 2024, 28.

[1008] After a WTO panel report in 2019 found that China's market price support for rice in each of the years 2012–15 exceeded China's de minimis level of 8.5 percent, China established a cap, 50 MMT of rice, which the government can procure rice from farmers under MSP each year. USDA, FAS, *Grain and Feed Annual: China - People's Republic Of*, April 4, 2018, 3, 22; WTO, Committee on Agriculture, "Notification - Domestic Support: People's Republic of China," December 14, 2022, 7; USDA, FAS, *Grain and Feed Annual: China - People's Republic Of*, April 6, 2020, 15.

[1009] USDA, FAS, *Grain and Feed Annual: China - People's Republic Of*, April 4, 2017, 5.

Public Stockholding for Rice

China's grain reserves (stocks) play an important role in facilitating the MSP program as well as stabilizing China's grain market. Following the introduction of the rice MSP in 2004, a form of public buffer stocks called temporary reserves was created.[1010] Temporary reserves are built from rice procured through the MSP. The government, through SOE operations, manages stock levels by buying excess rice in the market to prevent further price declines. The government then releases stocks when rice supply is low to provide price stability.[1011] The State Administration of Grain and Reserves is responsible for managing China's strategic reserves.[1012] SOEs such as Sinograin implement the policy through procuring grain to fill the reserves and buy and sell grain as active participants in the rice market, domestically and globally.[1013]

China has continued to support grain storage policies by improving capacity and the quality of storage facilities. Through government support, SOEs and local governments have built additional grain storage facilities to improve their storage capacity.[1014] By the end of 2023, China's grain storage facilities exceeded 700 MMT, a 36 percent increase from 2014.[1015] Modern storage facilities are low-temperature warehouses with improved fumigation, ventilation, and monitoring capacities.[1016]

Tariff-Rate Quota

Policies such as the MSP and rice storage in temporary reserves support China's domestic prices. Border measures such as the tariff rate quota (TRQ) have been important policy tools to limit rice imports when prices from foreign suppliers are lower than domestic prices. As discussed in the trade section of this report, TRQs allow a specified quantity of imports to enter the country at a lower tariff rate (in-quota). A high tariff rate applies to imports exceeding the in-quota quantity (out-of-quota). China's rice TRQ fill rates have been generally increasing since 2013, and rice imports in 2022, mainly milled long grain rice and broken rice, exceeded TRQ allocations for the first time since TRQs were established in 2001.[1017] Despite increased fill rates, China's unclear TRQ administration was of concern.[1018] Starting with its request for consultation with China in 2016, the United States filed a complaint at the WTO, claiming

[1010] Another price support policy that procured commodities was called Temporary Purchase and Storage Price. Deuss and Adenäuer, *China's Grain Reserves, Price Support and Import Policies*, February 4, 2020, 8, 11.
[1011] OECD, *The Economic Effects of Public Stockholding Policies for Rice in Asia*, October 18, 2018, 21–22.
[1012] Before governmental reorganization in 2018, the State Administration of Grain and Reserves was known as China's State Administration of Grain. It is an agency affiliated with the National Development and Reform Commission, a ministerial-level department of the State Council. USDA, FAS, *China Outlines the Responsibilities of the State Administration of Grain and Reserves*, October 26, 2018.
[1013] In 2022, a new SOE, China Enterprise United Grain Reserve, a joint venture from COFCO and Sinograin, was established to manage China's grain reserves. Boehme, "New Grain Giant to Manage China's Reserves," August 29, 2022.
[1014] USDA, FAS, *National Food Security Law Published*, February 14, 2024, 2–3; USDA, FAS, *Grain and Feed Annual: China—People's Republic of*, April 6, 2023, 11.
[1015] Reidy, "China Grain Storage Tops 700 Million Tonnes," June 4, 2024.
[1016] Reidy, "China Grain Storage Tops 700 Million Tonnes," June 4, 2024.
[1017] Fill rates equal imports divided by total TRQ volume. USDA, FAS, *Grain: World Markets and Trade*, February 2023, 9; Deuss and Adenäuer, *China's Grain Reserves, Price Support and Import Policies*, February 4, 2020, 15–16.
[1018] WTO, *China: Domestic Support (WT/DS511/1), Request for Consultations*, September 20, 2016, 2.

that China's TRQ administration was inconsistent with its WTO obligations.[1019] In 2019, the WTO concluded that the TRQ administration—in terms of basic eligibility criteria, allocation principles, reallocation procedures, public comment process, and the state and non-state trading enterprises portions of China's grain TRQs—was "inconsistent with the obligations to administer TRQs on a transparent, predictable, and fair basis, and using clearly specified requirements."[1020] Discussions between China and the United States on implementing the panel report remain on-going.[1021]

Factors Affecting Competitiveness

The competitiveness of China's rice industry in its domestic market is mainly based on policy-supported reliability of supply and delivered costs. Minimum support prices and production subsidies incentivize rice production, and China's public stockholding system prioritizes domestic rice market stability. In addition, China's TRQ policy limits rice imports, creating a delivered cost advantage over out-of-quota imports. China has limited reliability of supply as an exporter because export levels fluctuate according to domestic-focused government policies. However, agricultural policies that support production, which has exceeded consumption in many years, position China to have the capability to export, particularly old-crop rice exports from reserves that have historically been price competitive in the global rice market.

Government Support for Reliable Domestic Production

Food security and self-sufficiency in critical grains such as rice remain a top priority for the Chinese government.[1022] China has a government-mandated minimum requirement for rice area, and China's rice industry is incentivized, through various production-related subsidies and minimum prices, to achieve domestic rice production goals.[1023] In addition, SOEs have strengthened the industry's vertical integration, controlling multiple stages of the rice supply chain, with the goal of improving supply chain linkages.[1024] As a result, China's rice industry has continued to reliably supply rice to its domestic market (table 6.12). As long as the government considers rice a critical food grain that should be prioritized for self-sufficiency, policies and subsidies will likely continue to support China's rice industry to offset production costs and market its rice domestically.

[1019] Australia, the EU, Canada, and Thailand requested to join initial consultations. Regmi, *U.S. Challenges to China's Farm Policies*, April 14, 2021, 2; WTO, *China: Domestic Support (WT/DS511/1), Request for Consultations*, September 20, 2016.

[1020] WTO, *China: TRQ (WT/DS517/R), Panel Report*, April 18, 2019, 76.

[1021] After the United States alleged that China failed to bring its measures into compliance with its WTO obligations within an agreed period, China requested a compliance panel. Currently, the panelists have not yet been composed. As of August 30, 2021, the United States has paused arbitration of this matter and has indicated willingness to engage on a bilateral resolution. The Economic and Trade Agreement Between the United States of America and the Government of the People's Republic of China: Phase One was signed in 2020 and the Agreement included a provision that the WTO ruling would be implemented. Annex 14, Phase One Agreement (January 15, 2020); WTO, *China: TRQ (WT/DS517/20), Request for Compliance Panel*, July 16, 2021.

[1022] China's grain output has exceeded output goals for nine consecutive years. USDA, FAS, *Top Ag Policy Document Outlines Food Security*, March 12, 2024, 2.

[1023] Government official, interview by USITC staff, September 23, 2024.

[1024] Government official, interview by USITC staff, April 8, 2024; government official, interview by USITC staff, September 11, 2024.

Policy-Driven Price Competitiveness in Domestic Long Grain Market

China's domestic rice prices, specifically for long grain, are often higher than international long grain prices.[1025] China is close to major long grain rice exporters in South Asia and Southeast Asia, and their export prices are generally competitive relative to China's domestic long grain prices. As a result, in the absence of border measures, China's long grain rice would face significant price competition in its domestic market.[1026] However, China's TRQ limits in-quota imports. Long grain TRQ allocations have not risen since 2004, and even when fully filled, they account for less than 5 percent of domestic supply. Thus, TRQ policy results in a delivered cost advantage to the domestic rice industry. Out-of-quota imports are more expensive for consumers because of the high tariff rates.

Although out-of-quota imports rose in some years and were price competitive even after accounting for the high tariff rates for certain rice imports, such price competitive imports have been mostly limited to broken rice for animal feed use and not for table rice consumption.[1027] However, after rice demand for feed use decreased and international long grain prices rose, long grain imports decreased, not even filling TRQ allocations in MY 2023/24.[1028]

Domestic-Focused Policy Approach and Exports

China does not have an export-oriented rice industry because it focuses on its domestic market, but it still exported rice during the 2018–23 period. Notably, when stock levels of procured rice in temporary reserves are deemed "excessive," lower-quality, old-crop rice is auctioned for food and beverage manufacturing, feed use, or exports.[1029] Increased exports coincided with the period when China was liquidating large rice stocks from 2018 to 2020.[1030] However, recently, stock levels were deemed "sufficient" after rounds of government-led rice auctions from 2020 to 2023. MSP procurement levels since 2020 have been lower than previous years.[1031] Old-crop rice exports were limited because old-crop rice auctions prioritized rice for feed use.[1032] As a result, exportable supply has fluctuated and China has

[1025] USDA, FAS, *Grain and Feed Annual: China - People's Republic Of*, April 4, 2018, 24; USDA, FAS, *Grain and Feed Annual: China - People's Republic Of*, April 17, 2019, 15.

[1026] It is important to note that current levels of global rice exports can only satisfy about a third of China's domestic rice demand. From this perspective, China makes the case that China's self-sufficiency and rice security is important to a stable global agricultural trade, especially for One Belt, One Road countries that may have higher import levels to satisfy domestic demand.

[1027] USDA, FAS, *Grain and Feed Annual: China - People's Republic Of*, April 16, 2021, 10; USDA, FAS, *Grain and Feed Annual: China - People's Republic Of*, April 6, 2022, 11.

[1028] USDA, FAS, *Grain and Feed Annual: China - People's Republic Of*, April 2, 2024, 24–25.

[1029] Because actual rice stock levels are unknown, what the government deems stock levels as "excessive" or "sufficient" is neither public nor clear. Old-crop rice auctions are limited to a few participants, and SOEs account for a large share of participants. USDA, FAS, *Grain and Feed Annual: China - People's Republic Of*, April 2, 2024, 24; USDA, FAS, *Offloading Old Stock Rice Through Annual Auction*, February 3, 2023, 2. Industry representative, interview by USITC staff, August 6, 2024.

[1030] USDA, FAS, *Grain and Feed Annual: China - People's Republic Of*, April 6, 2020, 14–15.

[1031] USDA, FAS, *Grain and Feed Update: China - People's Republic Of*, July 3, 2024, 15–16; USDA, FAS, *Grain and Feed Update: China - People's Republic Of*, January 24, 2024, 14.

[1032] USDA, FAS, *Grain and Feed Annual: China - People's Republic Of*, April 2, 2024, 24; USDA, FAS, *Offloading Old Stock Rice Through Annual Auction*, February 3, 2023, 2–3.

not been able to consistently supply rice to the global market. Exports are seen as an option to reduce stocks rather than a catalyst for rice production.[1033] Despite China's reportedly large rice stocks, exports, as a share, have not increased significantly, suggesting that China is focused on managing its domestic rice market.

Old-Crop Rice Exports and Price Competitiveness

Although China has low exports relative to domestic rice production, old-crop rice exports are cost competitive in the global rice market.[1034] For importing countries that are relatively more price sensitive, securing rice at a lower delivered cost may be important, and China has been able to market its old-crop rice when it is available for export.

The government has promoted rice exports as a tool to manage rice reserves in some years. Increasing exports has been not a long-standing policy priority for the government.[1035] However, the assumption of China holding large stocks means China has the potential to export more old-crop rice. Domestic production exceeds domestic consumption in many years, and old-crop rice's price competitiveness gives China the ability to compete with lower-cost suppliers such as India in several markets. At the same time China's exports have fluctuated, some new export markets such as Puerto Rico have become relatively steady export markets for China.[1036] With China's competitive export prices, traditional suppliers such as the United States have lost significant market share in Puerto Rico, as described in chapter 9.[1037]

Indonesia

Indonesia is globally ranked as the fourth-largest producer and consumer of rice. Food sovereignty and self-sufficiency are major priorities for the Indonesian government, focusing on staple crops, including rice.[1038] With strong government involvement, Indonesia has been able to produce a large share of its domestic consumption needs; however, stagnating yields and decreasing cropland have negatively impacted production growth. In addition, population growth has caused aggregate consumption to outpace production, leading to increased dependence on imports. Indonesia's export potential is limited by the Indonesian government's emphasis on food self-sufficiency, the rice sector's high cost of production, and certain government policies.

[1033] Industry representative, interview by USITC staff, August 6, 2024.
[1034] USDA, FAS, *Grain and Feed Annual: China - People's Republic Of*, April 2, 2024, 26; USDA, FAS, *Grain and Feed Annual: China - People's Republic Of*, April 16, 2021, 11.
[1035] Industry representative, interview by USITC staff, August 6, 2024.
[1036] S&P Global, HS heading 1006, rice, accessed various dates.
[1037] Industry representative, interview by USITC staff, July 29–August 1.
[1038] In contrast to food security (a concept of the FAO), food sovereignty goes beyond "feeding the people" and also focuses on food production, acknowledging the key roles people and local communities play in alleviating poverty and hunger. The food sovereignty concept emphasizes autonomy of local and national economies with respect to production, distribution and consumption decisions and defends their right to produce and consume food before trading the surplus. Via Campesina, "Indonesia: Celebrating 25 Years of Struggle for Food Sovereignty," October 25, 2021; Lassa and Shrestha, "Food Sovereignty Discourse in Southeast Asia: Helpful or Disruptive?," November 20, 2014, 2.

Production

Indonesia became the fourth-largest producer of rice globally beginning in MY 2018/19, when Bangladesh's production levels began exceeding those of Indonesia.[1039] Indonesia produces primarily long grain white rice, as well as short grain white rice, brown rice, red rice, and black rice.[1040] Between MY 2018/19 and MY 2023/24, production decreased 3.5 percent (table 6.17). Yields remained stable during that period at 4.7 mt/ha; however, the decline in production was driven by ongoing reductions in harvested area. According to data from BPS-Statistics Indonesia, the harvested area for rice shrank by 1.17 million hectares between 2018 and 2023.[1041] This decrease was largely driven by of the rapid rate of conversion of rice fields into nonagricultural uses.[1042] Harvested area was further negatively impacted in recent marketing years (2022/23 and 2023/24) by a pronounced El Niño weather phenomenon that caused drought and reduced the realized harvested area.[1043]

Table 6.17 Indonesia: rice production, consumption, stocks, and trade, marketing years 2018/19–2023/24

In metric tons (mt), hectares (ha), kilograms (kg), metric tons per hectare (mt/ha), and percentages (%).

Attribute	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
Beginning stocks (1,000 mt)	5,563	4,063	3,313	3,060	2,900	4,700
Production (milled) (1,000 mt)	34,200	34,700	34,500	34,400	33,900	33,020
Area harvested (1,000 ha)	11,500	11,600	11,400	11,600	11,300	11,000
Yield (rough) (mt/ha)	4.7	4.7	4.8	4.7	4.7	4.7
Imports (1,000 mt)	600	550	650	740	3,500	3,800
Consumption and residual (1,000 mt)	36,300	36,000	35,400	35,300	35,600	36,000
Exports (1,000 mt)	0	0	3	0	0	0
Ending stocks (1,000 mt)	4,063	3,313	3,060	2,900	4,700	5,520
Exports-to-production ratio (%)	0.0	0.0	0.0	0.0	0.0	0.0
Ending stocks-to-use ratio (%)	11.2	9.2	8.6	8.2	13.2	15.3
Per capita consumption (kg)	135.9	133.5	130.2	128.9	129.2	129.7

Source: USDA, FAS, PSD Online database, accessed September 13, 2024; World Bank, Data: Population, accessed September 13, 2024.
Note: The USITC calculated per capita consumption using marketing year apparent consumption divided by calendar year population. All other data, including imports and exports, are based on the marketing year from January to December.

Consumption and Stocks

Indonesia became the fourth-largest consumer of rice globally beginning in MY 2020/21 when Bangladesh's consumption levels surpassed those of Indonesia. Apparent consumption averaged 35.8

[1039] USDA, FAS, PSD Online database, accessed August 21, 2024.

[1040] Black rice, also known as purple rice or forbidden rice, is an heirloom rice variety that is black in color and turns deep purple when cooked. Indonesian black rice is sticky and slightly sweet and commonly used in Indonesian desserts. Mogoginta, Murai, and Annor, "Starch Characteristics," July 31, 2024, 2; Bolay, "Everything You Always Wanted to Know About Forbidden Black Rice," August 18, 2021; Ubud Food Festival, "Indonesian Superfoods: Black Rice," March 21, 2017.

[1041] BPS-Statistics Indonesia, "Harvested Area, Productivity, and Production of Paddy by Province, 2018, 2023," October 15, 2024. Estimates from the USDA PSD Online database indicate a smaller decrease of 500,000 ha between MY 2018/19 and 2023/24. USDA, FAS, PSD Online database, accessed September 13, 2024.

[1042] USDA, FAS, *Grain and Feed Annual: Indonesia*, April 1, 2024, 18.

[1043] USDA, FAS, *Grain and Feed Annual: Indonesia*, April 1, 2024, 16; USDA, FAS, *Grain and Feed Update: Indonesia*, August 6, 2024, 15.

MMT between MY 2018/19 and MY 2023/24 (table 6.17). However, consumption dipped to 35.4 and 35.3 MMT in MY 2020/21 and MY 2021/22, respectively, as a result of economic slowdown and decreased consumer purchasing power stemming from the COVID-19 pandemic.[1044] Per capita consumption has been on a downward trend, decreasing 4.6 percent between MY 2018/19 and MY 2023/24, as a result of diversifying diets, particularly as consumers switch to wheat-based products.[1045] In addition, in line with rice self-sufficiency goals, the Indonesian government has made efforts to curb rice consumption by launching a "one day without rice" (per week) campaign and simultaneously promoting consumption of local staple crops.[1046] Despite declining per capita consumption, strong population growth has caused aggregate consumption to increase in recent years and it is projected to continue increasing in the future.[1047]

Indonesia maintains public stocks, which are managed by Bulog, the State Logistics Company. Bulog purchases rice from farmers when the market price is lower than or equal to the minimum support price set by government policies and targets year-end stocks of rice equal to 5 percent of consumption.[1048] National law stipulates that stocks must first be filled with domestic supplies before resorting to imports.[1049] In 2018, Indonesia imported between 1 percent and 4 percent of its total stock.[1050] According to a study by the Organisation for Economic Co-operation and Development (OECD), Indonesia maintains a higher share of rice in public stockholding relative to its total national supply than China, Bangladesh, Japan, or Thailand.[1051]

[1044] Consumption would have likely decreased further, but the Indonesian government's rice distributions offset lower rice consumption. Consumption increased in MY 2022/23 and MY 2023/24 largely as a result of population growth. USDA, FAS, *Grain and Feed Annual: Indonesia*, March 27, 2021, 15; USDA, FAS, *Grain and Feed Update: Indonesia*, July 17, 2020, 12. USDA, FAS, *Grain and Feed Annual: Indonesia*, April 1, 2024, 20.
[1045] Per capita consumption increased from 128.9 kg in MY 2021/22 to 129.2 kg in MY 2022/23 in part because of rice prices being more stable than wheat prices and the Indonesian government allocating rice to low-income households under the Beneficiary Families (KPM Keluarga Penerima Manfaat) program. USDA, FAS, *Grain and Feed Update: Indonesia*, August 6, 2024, 1. USDA, FAS, *Grain and Feed Annual: Indonesia*, March 26, 2019, 14. USDA, FAS, *Grain and Feed Annual: Indonesia*, April 1, 2024, 20.
[1046] The Indonesian government's efforts to curb rice consumption are aimed at reducing demand and, thus, the need for imports. Local staple crops include sweet potato, corn, and cassava. Indonesia Investments, "Rice Production Indonesia," June 28, 2017; Yusrin, "The Analysis of Rice Massive Importing in Indonesia," December 31, 2023, 321; Ansari et al., "Evaluating the Effect of Climate Change on Rice Production in Indonesia," August 31, 2023, 2; The New Humanitarian, "No Rice, No Way," February 17, 2012.
[1047] Yuan et al., "Southeast Asia Must Narrow down the Yield Gap," March 2022, 217, 219.
[1048] According to annual data from BPS-Statistics Indonesia, the annual average market price for paddy rice did not fall below the government purchase price between 2018 and 2022. Official annual data for 2023 and 2024 were not available at the time of writing. BPS-Statistics Indonesia, "Average Price of Paddy by Group of Quality and Government Purchasing Price at Farmer and Huller Level (Rupiahs/kg), 2000–2022," April 10, 2023. A new regulation (October 2022) requires government food reserves to equal up to 5 percent of domestic consumption needs for 11 staple commodities, including rice, doubling the previous 2.5 percent. OECD, *Agricultural Policy Monitoring and Evaluation 2023*, October 30, 2023, 368; Reuters, "Indonesia Targets 1.2 Mln Tonnes of Rice Reserves by Year-end," October 28, 2022.
[1049] OECD, *Agricultural Policy Monitoring and Evaluation 2023*, October 30, 2023, 374. Government of Indonesia, "Law on Food Number 18 of 2012," November 16, 2012, art. 36.
[1050] For comparison, the Philippines imported 10 percent of its total stock and Malaysia imported up to one-third over this time period. Oxford Business Group, "Indonesia Continues to Promote Self-Sufficiency in Rice Production," April 16, 2019.
[1051] Octania, *The Government's Role in the Indonesian Rice Supply Chain*, February 2021, 20.

Trade

As part of its focus on food sovereignty and self-reliance, the Indonesian government restricts imports of some foods, including rice.[1052] Under these restrictions, the government sets annual rice import quotas on the basis of public stock levels, domestic rice prices, and the national surplus estimate.[1053] Bulog is the only entity authorized to import medium quality rice—the most consumed type of rice in Indonesia. Licensed private companies can only import specialty rice.[1054] Between 2019 and 2022, imports averaged 409,000 metric tons ($191 million) (tables 6.18 and 6.19) but increased to over 3 MMT ($1.8 billion) in 2023 when drought-related production shortages led to a significant decrease in domestic supply.[1055] In 2023, Thailand and Vietnam supplied the large majority of Indonesia's increased demand for imports.

Table 6.18 Indonesia: imports of rice, by trade partner, 2018–23
In thousands of metric tons. ** = rounds to zero.

Trade partner	2018	2019	2020	2021	2022	2023
Thailand	796	53	89	69	80	1,382
Vietnam	764	33	89	66	82	1,148
Pakistan	311	183	111	52	84	309
Burma	42	167	58	4	4	141
India	338	8	11	215	179	70
Cambodia	0	0	0	1	0	13
Japan	**	**	**	**	**	**
China	**	**	**	**	**	**
Philippines	**	**	**	0	0	**
Malaysia	0	**	**	**	**	**
All others	**	1	**	**	**	**
Total	2,251	445	356	408	429	3,063

Source: S&P Global, General imports, HS heading 1006, rice, accessed August 2, 2024.
Note: The countries that have 0 values as import quantities are below 1,000 metric tons.

1052 OECD, *Agricultural Policy Monitoring and Evaluation 2023*, October 30, 2023, 374.
1053 USDA, FAS, *Grain and Feed Annual: Indonesia*, March 27, 2018, 16; Government of Indonesia, Presidential Regulation of the Republic of Indonesia No. 125 of 2022 Concerning Implementation of Government Food Reserves, October 24, 2022.
1054 Medium quality rice has a maximum of 25 percent broken grains. Specialty rice includes, but is not limited to jasmine rice, basmati rice, sushi rice, and rice seed. All rice imports are subject to a tariff of IDR 450/kg. USDA, FAS, *FAIRS Country Report: Indonesia*, January 6, 2023, 32. USDA, FAS, *Grain and Feed Annual: Indonesia*, March 27, 2018, 16; Octania, *The Government's Role in the Indonesian Rice Supply Chain*, February 2021, 9, 23.
1055 Between MY 2018/19 and MY 2021/22, Indonesia's ranking among global rice importers ranged from 21st to 28th; however, in MY 2022/23 and MY 2023/24, Indonesia became the third- and second-largest importer, respectively. USDA, FAS, PSD Online database, accessed various dates. September 17, 2024.

Table 6.19 Indonesia: imports of rice, by trade partner, 2018–23
In thousands of dollars. ** = rounds to zero.

Trade partner	2018	2019	2020	2021	2022	2023
Thailand	386,534	38,561	76,302	41,323	44,092	804,816
Vietnam	359,154	16,609	51,107	32,475	42,464	668,871
Pakistan	134,416	67,820	41,520	20,322	35,843	182,322
Burma	15,161	56,287	21,148	1,609	1,478	88,823
India	139,159	3,019	4,849	86,276	77,740	35,505
Cambodia	0	0	0	266	0	8,371
Japan	2	243	1	579	150	155
China	1,094	482	479	851	120	143
Philippines	2	2	1	0	0	15
Malaysia	0	**	**	**	**	2
All others	15	1,230	2	102	154	**
Total	1,035,537	184,254	195,409	183,802	202,042	1,789,024

Source: S&P Global, General imports, HS heading 1006, rice, accessed August 2, 2024.

National law restricts exports of staple foods, including rice, which can only be "implemented after fulfilling National Food Reserve and staple food consumption necessity."[1056] Thus, Indonesia exports only minimal quantities of rice—notably premium quality—averaging 2,000 metric tons ($1.6 million) during the 2018–23 period.[1057] In recent years (2021–23), the majority of these exports went to the Philippines. According to the USDA Foreign Agricultural Service, in MY 2020/21 Indonesia exported nearly 3,000 metric tons of rice to the Philippines, mainly through unofficial channels along the Indonesia-Philippines border.[1058] In 2020, the Indonesian government expressed plans to export 100,000–500,000 metric tons of premium rice; however, export data indicate that these plans have not yet been realized.[1059]

Industry Structure

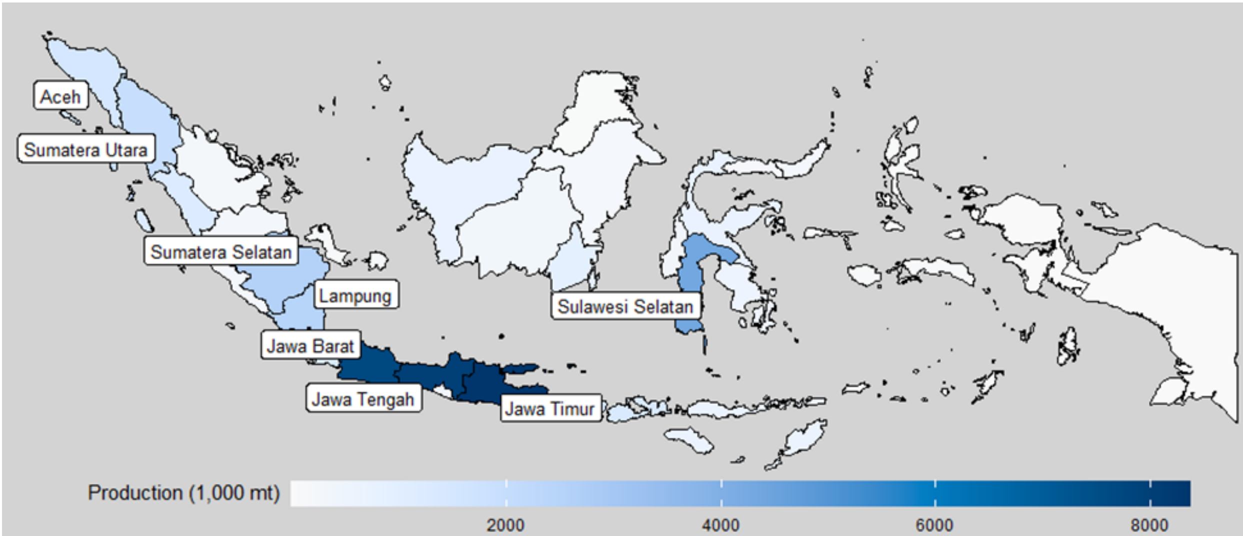
The Indonesian rice sector is dominated by smallholder farmers, who account for about 90 percent of Indonesia's rice production. Smallholder farms range from 0.2 ha to 0.7 ha in size.[1060] Production is concentrated in South Sumatra, West Java, Central Java, East Java, and South Sulawesi (figure 6.4). The industry also employs primarily traditional farming techniques with low adoption of mechanization.[1061] The small size of land holdings, combined with the reliance on traditional farming techniques, make the rice sector extremely labor intensive.[1062] Furthermore, labor availability is limited because low wages

[1056] OECD, *Agricultural Policy Monitoring and Evaluation 2023*, October 30, 2023, 375; Government of Indonesia, "Law on Food Number 18 of 2012," November 16, 2012, art. 34.
[1057] S&P Global, Total exports, HS heading 1006, rice, accessed August 2, 2024; USDA, FAS, *Indonesia Plans to Export Rice*, December 17, 2019, 2.
[1058] USDA, FAS, *Grain and Feed Update: Indonesia*, November 30, 2021, 12.
[1059] USDA, FAS, *Indonesia Plans to Export Rice*, December 17, 2019, 2.
[1060] Indonesia Investments, "Rice Production Indonesia," June 28, 2017; Hutapea et al., "Competitiveness of Indonesian Rice Prices in the International Market," July 20–21, 2022, 10.
[1061] The level of mechanization in Indonesian rice farming is lower than in China, Thailand, and Vietnam, but higher than in the Philippines. Hutapea et al., "Competitiveness of Indonesian Rice Prices in the International Market," July 20–21, 2022, 5. Putri, Hermansyah, and Santosa, "Index and Sustainability Status of Agricultural Mechanization for Paddy Field in Indonesia," September 19–20, 2024, 2.
[1062] Mawardi, "The Silent Dilemma of Indonesia's Rice Industry," April 7, 2024; Yamauchi, "Rising Real Wages, Mechanization and Growing Advantage of Large Farms," January 2016, 1.

discourage youth from working in agriculture. As a result, the majority of agricultural workers are 55 years old and older.[1063]

Figure 6.4 Indonesia: rice production by province, 2024

In thousands of metric tons (1,000 mt). Underlying data for this figure can be found in appendix F, table F.23.



Source: Compiled by the USITC. BPS-Statistics Indonesia, "Harvested Area, Productivity, and Production of Paddy by Province - Statistical Data," October 15, 2024.

Indonesia's rice yields have long been among the highest in Southeast Asia, as a result of significant growth between 1960 and 2010.[1064] This progress can be attributed in large part to adoption of high-yielding varieties, increased irrigation, and intensified fertilizer use.[1065] Recent data, however, indicate that yields have stagnated.[1066] Though the factors affecting yield growth are complex and interrelated, a key issue is slow uptake of new higher-yielding varieties, as Indonesian rice farmers would benefit from switching from using primarily inbred rice varieties to using hybrid varieties.[1067] It is estimated that hybrid rice varieties can increase yields by approximately 20 percent. In general, the low adoption of hybrid rice varieties is due, in part, to low availability and high prices of hybrid seeds.[1068] Indonesia created infrastructure to irrigate approximately 84 percent of its rice fields.[1069] However, many systems

[1063] Worker wages in the agricultural sector are the second-lowest among all economic sectors in Indonesia, only higher than "other service activities." Setiartiti, "Critical Point of View," October 13–14, 2020, 5–6; BPS-Statistics Indonesia, "Average of Net Wage/Salary," November 6, 2024.
[1064] This period of growth coincided with the Green Revolution. Yuan et al., "Southeast Asia Must Narrow down the Yield Gap," March 2022, 220–21; USDA, FAS, *Indonesia: Stagnating Rice Production Ensures Continued Need for Imports*, March 19, 2012.
[1065] Adoption of these high-yielding varieties was slow, indicating some resistance to new seed technology. To illustrate, Indonesian farmers have been cultivating IR64—the most popular high-yielding variety until recently—for more than 40 years, and it was not until 2011 that the variety reached 31 percent coverage of total national rice area. USDA, FAS, *Indonesia: Stagnating Rice Production Ensures Continued Need for Imports*, March 19, 2012.
[1066] Yuan et al., "Southeast Asia Must Narrow down the Yield Gap," March 2022, 217.
[1067] Inbred varieties include IR64, Cigeulis, Mekongga, Ciherang, and Inpari 30. Krishnamurti and Biru, *Expanding Hybrid Rice Production in Indonesia*, 2019, 4, 9.
[1068] It is estimated that during 2014–19, hybrid rice acreage was below 1 percent of the rice planting area in Indonesia. Krishnamurti and Biru, *Expanding Hybrid Rice Production in Indonesia*, 2019, 9–10.
[1069] OECD, *Agricultural Policy Monitoring and Evaluation 2023*, October 30, 2023, 374.

need to be repaired and government budgets are limited.[1070] In addition, although a long history of government-funded fertilizer subsidies (see Government Programs below) has aided Indonesia's yield growth, the rate of fertilizer application has been found to be excessive and inefficient, leading to negative environmental impacts and deteriorating soil conditions.[1071]

Government Programs

The Indonesian government is heavily involved in the domestic rice industry, with policies intervening at various levels of the supply chain.[1072] Given the importance of rice in consumption and food security, production policies and trade measures target self-sufficiency.[1073]

At the producer level, market price support and input subsidies are the main forms of support provided to producers. Market price support to producers—the most significant component of agricultural support in Indonesia—is delivered through domestic and trade policy measures.[1074] The minimum purchase price policy prohibits buyers, both public and private, from purchasing rice below the reference price from farmers to protect domestic farmers when prices are low due to abundant supplies. According to annual data from BPS-Statistics Indonesia, the annual average market price for paddy rice did not fall below the government purchase price between 2018 and 2022.[1075] Bulog manages the national rice reserves by purchasing rice from farmers at the mandated prices.[1076]

The Indonesian government also subsidizes inputs, including fertilizers, seeds, and credits. The Indonesian government has had various fertilizer subsidy policies in place since 1970; however, in 2022, the policy was adjusted in response to high global prices.[1077] Maximum prices of subsidized fertilizers

[1070] In 2014, roughly 46 percent of irrigation systems in Indonesia were in poor condition. Jha and Turk, "Making Every Drop Count," June 7, 2024.

[1071] Rafani and Sudaryanto, "Update on Fertilizer Subsidy Policy in Indonesia," July 6, 2023; Fatimah and Muhafidin, "Dynamics of Fertilizer Subsidy Implementation," February 8, 2024, 826; Susila, "Fertilizer Subsidy Policy: Revisited," 2010, 1; Abriningrum et al., *Who Is Benefiting from Fertilizer Subsidies in Indonesia?*, August 2011, 16.

[1072] In 2022, Indonesia reported to the WTO an aggregate measure of support of 2.98 percent for rice. This measure does not include domestic support for domestic food aid or input subsidies, which are both large budgetary line items for agricultural support and are generally directed at the rice sector. WTO, "Notification—Domestic Support: Indonesia," February 2, 2024, tbl. DS:1, DS:2, DS:4.

[1073] OECD, *Agricultural Policy Monitoring and Evaluation 2020*, June 30, 2020, 291.

[1074] OECD, *Agricultural Policy Monitoring and Evaluation 2020*, June 30, 2020, 290; Government of Indonesia, "Law of the Republic of Indonesia No. 19 of 2013 on the Protection and Empowerment of Farmers," August 6, 2013.

[1075] Official annual data for 2023 and 2024 were not available at the time of writing. Octania, *The Government's Role in the Indonesian Rice Supply Chain*, February 2021, 10; BPS-Statistics Indonesia, "Average Price of Paddy by Group of Quality and Government Purchasing Price at Farmer and Huller Level (Rupiahs/Kg), 2000–2022," April 10, 2023.

[1076] Bulog can only buy rice from farmers when the market price is lower than or equal to the minimum price. In 2022, a new regulation increased government food reserves to equal up to 5 percent of domestic consumption needs for 11 staple commodities, including rice, doubling the previous 2.5 percent. Octania, *The Government's Role in the Indonesian Rice Supply Chain*, February 2021, 11; OECD, *Agricultural Policy Monitoring and Evaluation 2023*, October 30, 2023, 368; Reuters, "Indonesia Targets 1.2 Mln Tonnes of Rice Reserves by Year-end," October 28, 2022.

[1077] Government of Indonesia, Ministry of Agriculture, Regulation of the Ministry of Agriculture Number 10/2022, October 1, 2022; OECD, *Agricultural Policy Monitoring and Evaluation 2023*, October 30, 2023, 367; Rafani and Sudaryanto, "Update on Fertilizer Subsidy Policy in Indonesia," July 6, 2023.

were increased, and the scheme was restricted to only three types of fertilizers and nine commodities, including rice.[1078] The main aim of the fertilizer subsidies is to increase productivity in line with national food security goals, though it is also credited with improving farmer welfare. However, multiple studies have found that the subsidy program encourages excessive and inefficient use of fertilizers, which may negatively impact soil health and environmental sustainability.[1079]

Additional government programs are aimed at supporting rice production. In MY 2015/16, the Indonesian government established a rice farm insurance scheme (Asuransi Usaha Tani Padi–AUTP program).[1080] The Indonesia Irrigation Improvement Program 2015–25 invests in irrigation infrastructure repair and is targeted to rice production.[1081] A new Food Estate Project (2020) aims to increase production of strategic crops, including rice, beyond Java island, where cropland is being converted to nonagricultural uses at an increasing rate.[1082] Furthermore, the Indonesian government is experimenting with rice varieties with increased tolerance to salinity.[1083]

The Indonesian government imposes restrictions on imports and exports of rice to protect the domestic market. Imports of rice are only permitted when government and industry stocks are low and when domestic supply is short, and medium quality rice must be imported through Bulog.[1084] Conversely, exports are only permitted after meeting year-end public stock reserves and domestic consumption needs.[1085] Indonesian policies focus on ensuring that domestic consumption needs are met and also have the effect of increasing prices for consumers in Indonesia relative to other markets.[1086]

[1078] The included fertilizer types were urea, NPK, and NPK special formula. In 2021, the program covered all fertilizers and 70 commodities. Rafani and Sudaryanto, "Update on Fertilizer Subsidy Policy in Indonesia," July 6, 2023; OECD, *Agricultural Policy Monitoring and Evaluation 2023*, October 30, 2023, 367.

[1079] Fatimah and Muhafidin, "Dynamics of Fertilizer Subsidy Implementation," February 8, 2024, 826; Susila, "Fertilizer Subsidy Policy: Revisited," 2010, 1; Rafani and Sudaryanto, "Update on Fertilizer Subsidy Policy in Indonesia," July 6, 2023; Abriningrum et al., *Who Is Benefiting from Fertilizer Subsidies in Indonesia?*, August 2011, 16.

[1080] The AUTP program provides subsidized crop insurance to rice farms up to 2 hectares and protects from loss due to flood, drought, and pest and disease infestations. Mutaqin, Karyana, and Sunendiari, "Pure Premium Calculation of Rice Farm Insurance Scheme in Indonesia," November 26, 2019, 2; Anugrah, Hestina, and Pasaribu, "Rice Crop Insurance Scheme to Protect Farmers from Natural Disaster Risks," 2024, 2.

[1081] The Indonesian government plans to repair 3 million hectares of irrigation facilities between 2015 and 2018. OECD, *Agricultural Policy Monitoring and Evaluation 2023*, October 30, 2023, 374–75. Indonesia Investments, "Rice Production Indonesia," June 28, 2017.

[1082] Indonesia has a long history of food estate programs, which are aimed at expanding cropland to increase production, typically by converting hectares of peatland and swamp for rice farming. The 2020 food estate program was launched in response to concerns regarding food security issues stemming from the COVID-19 pandemic. The effectiveness of these programs has been questioned. USDA, FAS, *If at First You Do Not Succeed*, May 6, 2021, 2; Lee, "Indonesia's 'Food Estate' Program Falls Short of Expectations," April 26, 2023, 1.

[1083] OECD, *Agricultural Policy Monitoring and Evaluation 2023*, October 30, 2023, 43.

[1084] Only private importers possessing a license can import rice for further food processing; only Indonesian government state-owned companies (e.g., Bulog) can import rice not intended for further processing. Imported rice can only be used as raw material for food manufacturing and cannot be sold to other parties. USDA, FAS, *FAIRS Country Report: Indonesia*, January 6, 2023, 32.

[1085] OECD, *Agricultural Policy Monitoring and Evaluation 2023*, October 30, 2023, 375.

[1086] As a result, Indonesian rice is often the most expensive in Southeast Asia. OECD, *Agricultural Policy Monitoring and Evaluation 2023*, October 30, 2023, 368; Oxford Business Group, "Indonesia Continues to Promote Self-Sufficiency in Rice Production," April 16, 2019.

To compensate for some of the price effects mentioned above, the Indonesian government carries out programs aimed at benefiting consumers by offering lower prices for rice, including food assistance and distributions of public stocks to retailers. Bulog distributes rice in the form of food assistance to low-income households. Previous iterations of these programs distributed rice physically, but the Non-Cash Food Assistance program, which was established in 2019, transformed food assistance into an electronic food voucher program.[1087] In addition, Bulog assists in controlling the price of rice at the consumer level. Under the 2022 Rice Food Price and Supply Stabilization Program, Bulog distributes rice directly to retailers, instead of private distributors.[1088] The Rice Food Price and Supply Stabilization Program was designed to adjust to the market whereby Bulog distributes more rice when the price is high and buys rice when the price is low.

Factors Limiting Export Potential

Indonesia exports minimal amounts of rice, despite being a top global producer. Although the Indonesian government has expressed interest in increasing exports of "premium" rice, trade data suggests those plans have not yet been realized.[1089] Several factors limit Indonesia's export potential, including the Indonesian government's emphasis on food self-sufficiency, the rice sector's high cost of production, and certain government policies.

The Indonesian government's focus on achieving rice self-sufficiency prioritizes domestic consumption needs over export opportunities. As noted above, national law limits exports of staple foods, including rice, allowing exports only after fulfilling both domestic food consumption and National Food Reserve demands.[1090] As a result, supplies available for export are limited. Additionally, domestic consumption is projected to continue increasing—in conjunction with population growth—and outpace domestic production, resulting in short domestic supply and further limiting supplies available for export.[1091]

[1087] Government of Indonesia, Presidential Regulation (63/2017) on the Disbursement of Non-Cash Social Assistance, July 2017; OECD, *Agricultural Policy Monitoring and Evaluation 2023*, October 30, 2023, 372, 374.
[1088] This is similar to the Supply Availability and Price Stabilization program (2018–22). Ghifari, "State Intervention Backfires as Rice Prices Hit Multiyear High," March 11, 2023. Government of Indonesia, Presidential Regulation (125/2022) concerning implementation of government food reserves, October 24, 2022.
[1089] USDA, FAS, *Indonesia Plans to Export Rice*, December 17, 2019, 2; S&P Global, Total exports, HS heading 1006, rice, accessed August 2, 2024.
[1090] OECD, *Agricultural Policy Monitoring and Evaluation 2023*, October 30, 2023, 375; Government of Indonesia, Law on Food Number 18 of 2012, November 16, 2012, art. 34.
[1091] Yuan et al., "Southeast Asia Must Narrow down the Yield Gap," March 2022, 217, 219.

Even if Indonesia were to have an exportable surplus of rice, its competitiveness vis-à-vis other rice-producing countries, particularly in Asia, would be hindered by its relatively high cost of production.[1092] Many factors, including land, labor, and fertilizer costs, contribute to this overall higher cost.[1093] Labor, in particular, suffers from various challenges. The Indonesian rice sector is dominated by traditional farming techniques, making it difficult to achieve efficiency gains because it is extremely labor intensive. Increasing wages—driven by productivity gains in other sectors of the economy—have caused labor costs to escalate.[1094] Limited investment in modernization, such as research and development and mechanization, has hindered output-related productivity growth.[1095] These two dynamics have contributed to the low competitiveness of Indonesian rice in the international market.

Finally, though Indonesia's rice sector benefits from strong government support, some of these policies, particularly producer price supports and import restrictions, come at the expense of the industry's competitiveness relative to other countries. In particular, market price support programs often create large price gaps between domestic and international markets for rice, which, when combined with import restrictions, have contributed to Indonesia's having rice prices well above world market prices, which greatly diminishes Indonesia's export competitiveness.[1096] In addition, though import restrictions are aimed at protecting the domestic rice sector, they also insulate the industry—including producers, processors and distributors—from foreign competition, which according to a report from the Center for Indonesian Policy Studies, could otherwise incentivize productivity growth in the domestic industry and lower delivered cost.[1097]

[1092] According to a 2016 study using 2013–14 crop year data, Indonesia had the highest cost of production when compared to other major rice producing countries in Asia (including China, the Philippines, India, Thailand, and Vietnam). Staff did not find more recent cost of production data; however, subject matter experts confirmed that it is unlikely that Indonesia's cost of production has improved relative to other producers in Asia, particularly given Indonesia's slower adoption of mechanization. Another source indicated that Indonesian rice is often the most expensive in Southeast Asia, costing about $800 per metric ton, compared to $300 per metric ton in Vietnam. Hutapea et al., "Competitiveness of Indonesian Rice Prices in the International Market," July 20–21, 2022, 4. Bordey et al., *Competitiveness of Philippine Rice in Asia*, 2016. IRRI, "Indonesia Targets Rice Self-Sufficiency," October 18, 2016; Firdaus, "The Value Chain and Rice Price Policy in Indonesia," June 6–7, 2018. Oxford Business Group, "Indonesia Continues to Promote Self-Sufficiency in Rice Production," April 16, 2019. Subject matter experts, interview by USITC staff, November 19, 2024.

[1093] USITC, *Rice: Global Competitiveness*, April 2015. IRRI, "Indonesia Targets Rice Self-Sufficiency," October 18, 2016.

[1094] Mawardi, "The Silent Dilemma of Indonesia's Rice Industry," April 7, 2024.

[1095] Mawardi, "The Silent Dilemma of Indonesia's Rice Industry," April 7, 2024.

[1096] Octania, *The Government's Role in the Indonesian Rice Supply Chain*, February 2021, 31.

[1097] Octania, *The Government's Role in the Indonesian Rice Supply Chain*, February 2021, 31.

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Chapter 7
South America

Summary

South American rice exporters primarily supply other South American countries under preferential market access afforded by the Southern Common Market (MERCOSUR) Agreement. The largest exporters in South America are Brazil, Paraguay, and Uruguay. The major export destinations for rice produced in the region are Brazil, Venezuela, Mexico, and Central America.[1098] South American exporters are gaining market share in Mexico and Central America, often at the expense of the United States. Rice exported from Brazil, Paraguay, and Uruguay has a reputation for being high quality, with Uruguay offering some of the highest-quality long grain white rice in the world.[1099] Rice production in South America's major exporting countries is characterized by high yields; large farms; and mostly irrigated, efficient, and mechanized production methods. Rice is sown as a single crop and often rotated with livestock, soybeans, and corn. The rice industries in these countries receive little direct government financial support. Instead, most government support is in the form of programs covering research, pest and disease control, training and extension, inspection, and marketing.

High yields and efficient, mechanized production on large farms in Brazil, Paraguay, and Uruguay support lower fixed costs per ton of rice produced and higher capital investment in all stages of rice production and processing. This is especially important because the region's major exporting countries compete in price-sensitive markets. Production efficiencies help offset South America's higher labor and land costs when compared to lower-income rice-producing countries. Poor transportation infrastructure adds significantly to the delivered cost of the region's rice exports.

Regional Overview

During marketing years (MY) 2018/19–2023/24, South American countries jointly produced 16.4 million metric tons (mt) annually on average, contributing about 3 percent of global production over the same time period. Most production is of long grain rice. Rice is produced throughout South America, concentrated in a few major countries, with the top three producers—Brazil, Peru, and Colombia—responsible for approximately 70 percent of regional production (table 7.1).[1100] Most of the region's exports originate in Brazil, Paraguay, and Uruguay. Most rice produced in Brazil is for domestic consumption, while rice produced in Paraguay and Uruguay is almost entirely destined for export markets.

[1098] S&P Global, HS heading 1006, rice, accessed various dates.
[1099] FarmProgress, "Rice Quality at Heart of U.S. Market Share Woes in Latin America," January 3, 2024.
[1100] This chapter of the report focuses on Brazil, Paraguay, and Uruguay because they are major exporters; Peru and Colombia are not major rice exporters.

Table 7.1 South America: rice production, marketing years 2018/19–2023/24
In thousands of metric tons, by marketing year.

Country	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
Brazil	7,129	7,605	8,001	7,337	6,822	7,225
Peru	2,454	2,291	2,347	2,433	2,400	2,500
Colombia	1,711	1,745	1,997	1,945	1,718	1,930
Uruguay	840	846	916	974	965	900
Ecuador	851	693	842	948	984	865
Paraguay	718	798	793	725	850	860
Argentina	774	795	945	794	756	825
Guyana	627	682	688	559	611	650
Bolivia	414	336	380	420	380	385
Venezuela	170	140	149	163	257	292
Suriname	173	173	157	167	170	168
Chile	112	109	93	64	70	76
Total	15,973	16,213	17,308	16,529	15,983	16,676

Source: USDA, FAS, PSD Online database, accessed September 13, 2024.

Rice is an important staple food in South American diets with annual per capita consumption of about 37 kilograms, significantly lower than most Asian countries but higher than in North America and Europe. Between 2018/19 and 2023/24, South American rice consumption averaged 14.9 million mt annually, making up less than 3 percent of global consumption. In general, South America's rice consumption is moderated by competing consumption of other starches like corn, wheat, and cassava.[1101] The consumption of rice in South America is concentrated in a few countries, with Brazil, Peru, Colombia, and Ecuador consuming almost 80 percent. Brazil is the region's largest rice consumer on both an aggregate and per capita basis.[1102]

South America exported about 3.9 million mt annually between 2018 and 2023, which accounted for 8 percent of the volume of global exports.[1103] Of these exports, about 40 percent were destined within the region and 60 percent externally. For imports, during 2018–23, South American countries imported about 1.62 million mt annually, representing about 4 percent of the volume of global imports.[1104] About 80 percent of these imports were sourced from countries within the region, and only 20 percent from outside the region. In addition to market proximity, the strong regional integration exhibited in trade data is closely linked to the economic and political bloc MERCOSUR. Argentina, Brazil, Paraguay, Uruguay, and Venezuela are members of MERCOSUR; seven other South American countries are designated MERCOSUR Associated States.[1105] Rice imported from outside the MERCOSUR free trade area faces

[1101] Cassava, also known as yuca, manioc, and tapioca, is a starchy tuber and is a common staple in South American diets.
[1102] USDA, FAS, PSD Online database, accessed December 27, 2024.
[1103] In terms of value, during 2018–23, South American rice exports were $1.64 billion annually on average, 6.3 percent of the value of global exports of rice, based on GTAS data. According to PSD Online data, South America supplied 7.4 percent of global exports by volume between MY 2018/19 and MY 2023/24. USDA, FAS, PSD Online database, accessed September 13, 2024; S&P Global, HS heading 1006, rice, accessed various dates.
[1104] In terms of values, during 2018–23, South American rice imports were $770 million annually on average, or 3.4 percent of the value of global imports of rice, based on GTAS data. According to PSD Online data, South America also received about 4 percent of global imports by volume between MY 2018/19 and MY 2023/24. USDA, FAS, PSD Online database, accessed September 13, 2024; S&P Global, HS heading 1006, rice, accessed various dates.
[1105] Venezuela has been suspended from MERCOSUR since December 2016. MERCOSUR, "MERCOSUR Countries," accessed April 11, 2024.

common external tariff rates between 9 and 10.8 percent; rice is traded tariff free within MERCOSUR.[1106] Some rice producers also operate across MERCOSUR member states.[1107]

Brazil, Paraguay, and Uruguay are the most export-oriented countries in the region. These three countries rank among the top 10 global rice-exporting countries. Together, Brazil, Paraguay, and Uruguay supplied close to 80 percent of South America's exports by volume between 2018 and 2023 (table 7.2). Most of these exports are destined for other South American countries, Central America, and Mexico, with exports to Central America and Mexico competing directly with U.S. exports (figure 7.1).[1108] Brazil exports about 15 percent of its rice production, with the remainder filling domestic demand. By contrast, rice production in Uruguay and Paraguay is almost entirely export oriented. Brazil, Paraguay, and Uruguay export both paddy and milled long grain rice. Brazil also exports a significant amount of broken rice, but Paraguay and Uruguay do not. However, Paraguay and Uruguay export a significant amount of brown rice. The combined exports of Brazil, Paraguay, and Uruguay have increased since 2018, despite falling in 2021 as a result of drought conditions affecting overall production levels.[1109]

Table 7.2 South America: exports of rice, by country, 2018–23

In thousands of metric tons. ** = rounds to zero.

Trade partner	2018	2019	2020	2021	2022	2023
Brazil	1,459	1,063	1,401	854	1,731	1,454
Uruguay	829	872	1,032	761	1,096	1,108
Paraguay	707	738	903	693	824	911
Guyana	470	484	625	438	509	444
Argentina	299	289	271	272	316	217
Peru	**	37	45	1	20	11
Ecuador	32	29	44	22	46	7
Suriname	31	32	48	26	6	4
Venezuela	0	0	0	1	1	3
Chile	4	3	**	**	**	2
Colombia	1	0	2	1	2	**
Bolivia	0	0	0	0	0	**
Total	3,832	3,548	4,372	3,070	4,551	4,160

Source: S&P Global, Total exports, HS heading 1006, rice, accessed September 24, 2024.

1106 MERCOSUR's common external tariff is a core pillar of the MERCOSUR agreement that imposes an import tariff on goods imported from outside the MERCOSUR trading bloc. Imports from MERCOSUR members do not face import tariffs. Imports of broken rice (HS 1006.40) from outside of MERCOSUR face a 9 percent tariff, while milled rice (1006.30) imported from outside of MERCOSUR faces tariffs between 9 and 10.8 percent. Secretaría del MERCOSUR, "Consultas a la Nomenclatura Común y al Arancel Externo del MERCOSUR [Consultations on the Common Nomenclature and the External Tariff of MERCOSUR]," accessed October 1, 2024.

1107 U.S. government official, interview by USITC staff, August 30, 2024.

1108 For more information on competition between exports from the United States and South America in Mexico and Central America, see chapter 9.

1109 USDA, FAS, *Grain and Feed Annual: Paraguay*, April 15, 2022, 7; USDA, FAS, *Grain and Feed Update: Brazil*, July 1, 2022, 17; USDA, FAS, *Grain and Feed Annual: Paraguay*, April 15, 2022, 7.

Figure 7.1 Major export flows from top exporters in South America, 2023

In thousands of metric tons (1,000 mt). Underlying data for this figure can be found in appendix F, table F.24.

Source: S&P Global, Total exports, HS heading 1006, rice, accessed September 24, 2024.
Note: This map only displays major trade flows for exports originating in Brazil, Paraguay, and Uruguay.

Between 2018 and 2023, South America's rice exports benefited from temporary tariff reductions in Mexico and Costa Rica, which allowed Brazil and, to a lesser extent, Uruguay to displace U.S. rice exports in those markets.[1110] Buyers in Mexico and Central America ultimately buy rice on the basis of price. However, rice exported from South America also has a reputation for being high quality, with uniform grain lengths and minimally chalky grains, both desirable attributes for milling and cooking.[1111] Uruguay

[1110] For more discussion of how these tariff reductions affected rice trade, see chapter 9.
[1111] Success in uniform grain characteristics with minimal chalky grains is reportedly due to research and investment in Brazil and Uruguay to develop a high-quality crop and the use of common varieties across the industry, which improves milling quality. U.S. government official, interview by USITC staff, August 30, 2024; U.S. government official, interview by USITC staff, September 12, 2024.

is considered a global leader in this regard. Some consumers rank rice from South America as being of a higher quality than rice grown in the United States.[1112]

Brazil

Brazil is the largest rice producer in South America and the ninth-largest exporter in the world. It produces nonaromatic long grain rice and exports both paddy and milled rice. Being a large consumer of rice, it both exports and imports large quantities of rice. Rice production in Brazil is characterized by large agribusinesses and mechanized processes concentrated in Southern Brazil. Government intervention in Brazil's rice industry is minimal, although Brazil has used market price support tools in the past on rice and other crops. Despite minimal government intervention, rice production benefits from extensive government-led research and development in increasing yields and developing rice varieties with desirable attributes. Research from both the public and private sectors, combined with the economies of scale from large agribusinesses, help keep Brazil cost competitive in the face of high production and transportation costs in the Brazilian market.

Production

Brazil produced 7.2 million mt in MY 2023/24, making it the 11th-largest producer in the world, with a global share of 1.4 percent (tables 7.3 and 2.4). Brazil produces long grain, nonaromatic rice, and exports approximately 12–20 percent of its production each year.[1113] Between MY 2018/19 and MY 2023/24, production fluctuated, rising to more than 8 million mt in MY 2020/21 before dropping to 6.8 million mt in MY 2022/23 and recovering to 7.2 million mt by MY 2023/24. These fluctuations were largely driven by harvested hectares, within an overall long-term trend of steady reduction in rainfed production areas. This decline is attributed to several factors, including recent droughts and floods from La Niña and El Niño events, availability and cost of irrigation water, capital costs, and the higher relative profitability of competing crops, mainly soybeans and corn.[1114]

Over the period, crop yields were mostly stable at close to 7.0 mt/ha, above the global average of 4.6 mt/ha.[1115] Yields have seen long-term growth, which has kept production levels stable despite declining planted area. Improved yields are due to a combination of factors, including the effective transfer of new technologies from research to production; the consolidation of rice growing in the efficient, irrigated areas of the south; and government efforts to develop new, productive varieties.[1116]

[1112] Datasur, "El Auge de las Exportaciones de Arroz de Paraguay [Paraguay's Rice Export Boom]," March 18, 2024; USA Rice, "Honduras Approves Rice from Paraguay," May 14, 2016; Bennett, "U.S. Rice Quality and Quantifying Customer Demands," September 3, 2013.
[1113] USA Rice, "Brazil Looks to Temporarily Suspend Tariffs on Rice Imports," August 27, 2020.
[1114] The reduction of land planted with rice is reportedly limited, owing to its importance in crop rotations by providing weed control, soil improvements, and pest control benefits that translate into lower farm production costs. The limit on the reduction of land under rice is attributed to its importance in crop rotations by providing weed control, soil improvements, and pest control benefits that translate into lower farm production costs. USDA, FAS, *Grain and Feed Annual: Brazil*, April 1, 2020, 16–17; USDA, FAS, *Grain and Feed Annual: Brazil*, April 12, 2022, 23–24; USDA, FAS, *Grain and Feed Update: Brazil*, November 6, 2023.
[1115] USDA, FAS, PSD Online database, accessed various dates.
[1116] For sources and more information on government-led R&D, see the Government Programs section.

Table 7.3 Brazil: rice production, consumption, stocks, and trade, marketing years 2018/19–2023/24
In metric tons (mt), hectares (ha), kilograms (kg), metric tons per hectare (mt/ha), and percentages (%), by marketing year.

Attribute	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
Beginning stocks (1,000 mt)	1,210	846	827	1,162	901	617
Production (milled) (1,000 mt)	7,129	7,605	8,001	7,337	6,822	7,225
Area harvested (1,000 ha)	1,703	1,666	1,679	1,618	1,480	1,550
Yield (rough) (mt/ha)	6.2	6.7	7.0	6.7	6.8	6.9
Imports (1,000 mt)	735	895	634.0	933	1,040	1,100
Consumption and residual (1,000 mt)	7,350	7,300	7,350	7,150	7,000	7,100
Exports (1,000 mt)	878	1,219	950	1,381	1,146	1,000
Ending stocks (1,000 mt)	846	827	1,162	901	617	842
Exports-to-production ratio (%)	12.3	16.0	11.9	18.8	16.8	13.8
Ending stocks-to-use ratio (%)	9.3	8.8	12.3	9.6	7.0	9.4
Per capita consumption (kg)	35.0	34.5	34.5	33.4	32.5	32.8

Source: USDA, FAS, PSD Online database, accessed September 13, 2024; World Bank, Data: Population, accessed September 13, 2024.
Note: A marketing year runs from April to March the following year. For example, marketing year 2018/19 was from April 2019 through March 2020. Per capita consumption was calculated using marketing year apparent consumption divided by calendar year population. All other data, including imports and exports, are based on the marketing year.

Consumption and Stocks

Since MY 2018/2019, Brazilian rice consumption has fallen modestly, by about 0.6 percent annually on average through MY 2023/24. Rice still plays a large role in Brazilians' diets, but rice consumption is trending downward as consumers choose fast food, food with quicker preparation times, and lower-carbohydrate diets.[1117] This decline is more pronounced among higher-income Brazilians.[1118] However, during the COVID-19 pandemic, consumption rose briefly because social distancing measures increased cooking at home and pandemic-related government support payments briefly increased demand for rice.[1119] While overall consumption is declining, consumer interest in specialty rice is on the rise.[1120]

Most of Brazil's stocks are privately held, with a minimal amount held through public stocks. For example, in 2022, public rice stocks accounted for less than 1 percent of stocks.[1121]

Although the Brazilian government maintains a program to acquire public stocks of rice and other agricultural commodities through a public auction, the government did not acquire rice stocks between 2018 and 2023.[1122] This was due to high rice prices, which discouraged public purchases of rice, and efforts from the Temer and Bolsonaro administrations—2016–19 and 2019–23, respectively—to dismantle this program.[1123] However, in 2024, the government was authorized to import rice to fill stocks

[1117] USDA, FAS, *Grain and Feed Annual: Brazil*, April 10, 2023, 26.
[1118] Rodrigues et al., "Most Consumed Foods in Brazil," November 16, 2021, 7.
[1119] USDA, FAS, *Grain and Feed Update: Brazil*, January 29, 2021, 16.
[1120] Specialty rice varieties from Italy, such as *arborio* and *carnaroli*, are also traditionally consumed in Brazil due to Brazil's large share of the population with Italian heritage. More recent specialty varieties include aromatic rice and pigmented rice. Wickert et al., *SCS123 Pérola: A Brazilian Rice Variety for Risotto*, December 12, 2018.
[1121] In December 2022, public stocks of rice were approximately 1,760,000 kg (1,760 mt). During MY 2021/22 PSD estimates indicate that rice stocks were 901,000 mt. CONAB, "Portal de Informações Agropecuárias [Agricultural Information Portal]," accessed various dates.
[1122] Konchinski, "Without stocks of rice and beans," May 9, 2024; Abreu, Paranaiba, and Wander, "The Price Subsidy Policy in Brazilian Agriculture," 2018.
[1123] Konchinski, "Without stocks of rice and beans," May 9, 2024.

and lower domestic rice prices following floods in Brazil's rice-producing areas. However, this auction was canceled because of "irregularities in winning bidders."[1124] Now, there are no public stocks of rice.[1125]

Trade

Brazil is a major global exporter of rice. In 2023, Brazil exported about 1.5 million mt, valued at $621 million (tables 7.4 and 7.5), making it the ninth-largest exporter, with a global share of 2.7 percent (by volume).[1126] Approximately half of Brazil's rice exports by value are of paddy rice, followed by broken rice, at just over 25 percent.[1127] Brazil's rice export volume was almost identical in 2018 and 2023, although it fluctuated widely in the intervening years. For example, exports fell in 2019 largely because of lower demand by Venezuela before export levels subsequently rebounded in 2020.[1128] In 2021, supply chain disruptions and container shortages associated with the COVID-19 pandemic resulted in another drop in export levels in 2021, impeding some paddy rice exports through 2022.[1129]

Table 7.4 Brazil: exports of rice, by major destination, 2018–23
In thousands of metric tons. ** = rounds to zero.

Trade partner	2018	2019	2020	2021	2022	2023
Mexico	0	1	100	32	447	312
Senegal	149	165	124	96	229	223
Venezuela	593	306	302	127	218	219
Costa Rica	64	15	116	83	151	218
Gambia	88	102	96	84	80	93
Peru	82	103	119	89	65	55
Cuba	59	29	61	61	119	53
Netherlands	20	**	29	107	63	50
United States	42	38	65	40	44	48
El Salvador	0	0	11	0	50	46
All other	362	304	378	136	266	137
Total	1,459	1,063	1,401	854	1,731	1,454

Source: S&P Global, Total exports, HS heading 1006, rice, accessed August 2, 2024.

[1124] TV BRICS, "Brazil to Purchase Industrially Processed and Packaged Rice on International Market," May 12, 2024; Abreu, Paranaiba, and Wander, "The Price Subsidy Policy in Brazilian Agriculture," 2018; Cruz, "Brazilian Government Cancels Controversial Rice Auction," June 11, 2024; Konchinski, "Without stocks of rice and beans," May 9, 2024.
[1125] Salati, "Plano Safra Terá Estímulo [Safra Plan will encourage]," June 1, 2024; CONAB, "Portal de Informações Agropecuárias [Agricultural information Portal]," accessed various dates.
[1126] During 2018–23, Brazil exported about 15 percent of its production. USDA, FAS, PSD Online database, accessed December 27, 2024.
[1127] Brazil is one of the few major exporters of paddy rice besides the United States. S&P Global, Total exports, HS heading 1006, rice, accessed August 2, 2024.
[1128] According to the USDA, Venezuela's purchases of Brazilian rice were by the government to supply Venezuela's subsidized food program. However, financial constraints in the period led to a significant drop in purchases. USDA, FAS, *Grain and Feed Update: Brazil*, October 5, 2021, 16.
[1129] Sociedade Nacional de Agricultura, "Falta de contêineres afeta as exportações brasileiras de arroz [Lack of containers affects Brazilian rice exports]," May 23, 2022; USDA, FAS, *Grain and Feed Update: Brazil*, October 5, 2021, 15–16.

Table 7.5 Brazil: exports of rice, by major destination, 2018–23
In thousands of dollars.

Trade partner	2018	2019	2020	2021	2022	2023
Mexico	0	235	29,533	8,384	152,942	119,853
Costa Rica	16,861	4,237	29,155	27,564	49,693	90,338
Senegal	44,525	48,676	40,176	34,727	84,848	87,530
Venezuela	170,568	97,998	103,691	51,371	79,084	82,161
Peru	40,816	49,894	60,766	57,149	36,763	37,962
Gambia	26,478	29,716	30,890	30,124	29,339	36,504
Cuba	27,264	12,280	27,525	29,860	49,834	33,728
United States	15,822	15,998	30,190	18,140	21,171	28,106
El Salvador	0	0	3,087	0	17,323	17,657
Netherlands	5,024	29	6,592	35,489	21,895	16,453
All other	119,389	109,387	141,975	66,282	113,440	71,171
Total	466,748	368,449	503,580	359,090	656,333	621,463

Source: S&P Global, Total exports, HS heading 1006, rice, accessed August 2, 2024.

Between 2018 and 2023, Brazilian exports were concentrated in a few major destination markets, with both quantities and values fluctuating widely during the period (tables 7.4 and 7.5). The most significant development was the emergence of Mexico as the leading destination. Exports to Mexico, consisting primarily of paddy rice, rose from zero in 2018 to a record 447,000 mt in 2022, about one-quarter of all Brazilian exports that year, and remained at close to this share in 2023. These exports can be attributed mostly to the Mexican government's anti-inflation policy that temporarily eliminated the 9 percent most-favored nation tariff on rice imports from any trading partner with a phytosanitary protocol with Mexico.[1130] Senegal is Brazil's second-largest export destination, to which it supplies mostly broken rice in competition with mainly India and Pakistan.[1131] Venezuela was the third-largest destination in 2023 and leading export market for Brazilian rice until 2021. Exports to Venezuela consist of both paddy and milled rice.[1132]

Brazil is also an importer of rice. In 2023, Brazil imported close to 1 million mt (of which about two-thirds were white rice and one-third brown rice), valued at $529 million, accounting for about 14 percent of domestic consumption (tables 7.6 and 7.7). Between 2018 and 2023, import volumes trended up,

[1130] This policy action followed the presidential anti-inflation decree "Paquete contra la inflación la carestia" (PACIC) instituted in May 2022. The rice imports impacted are those falling under Mexican Tariff Schedule subheading 1006.10.99 for other paddy rice, and under the subheading 1006.30.99, which are classified as having a 3:1 or greater ratio between the length and width of the grain. This decree was extended on December 27, 2023 through the end of 2024. USDA, FAS, *Brazil Lowers Agricultural Tariffs to Fight Inflation*, May 16, 2022; Government of Mexico, DOF, "DECRETO por el que se exenta el pago [DECREE exempting the payment]," May 16, 2022; USDA, FAS, *Grain and Feed Annual: Brazil*, April 1, 2024, 18. For more information, see Chapter 9.
[1131] Senegal leads West Africa in rice consumption per capita, at 90 kg per year.
[1132] Brazil and the United States are important sources of Venezuelan rice imports. U.S. exports to Venezuela declined in 2022 due to both a low supply of U.S. rice in the export and price competition with Brazil and other South American producers. The drop in U.S. rice exports' market share in Venezuela and Mexico began showing signs of recovery in the MY 2023/2024 crop, but it is likely that competition with South American producers will continue. USDA, ERS, *Rice Outlook: February 2024*, February 12, 2024, 7–8; S&P Global, HS heading 1006, rice, accessed various dates.

increasing by about 11 percent annually. Over this period, imports grew to meet higher domestic consumption during the COVID-19 pandemic and lower domestic supply.[1133]

Between 2018 and 2023, Brazilian imports were almost entirely from Paraguay and Uruguay, and to a lesser extent, Argentina, all entering Brazil duty free under MERCOSUR trade preferences (tables 7.6 and 7.7). Imports from Paraguay and Uruguay also benefit from proximity and comparatively low shipping costs to certain major population centers in Brazil. These low costs make it cheaper to import rice into certain population centers than to transport domestically produced rice from Southern Brazil.[1134] Imports from Uruguay and Paraguay are also not subject to the value-added taxes and other fees imposed on Brazilian producers, which can make them relatively cheaper.[1135]

Table 7.6 Brazil: imports of rice, by major source, 2018–23

In thousands of metric tons. ** = rounds to zero.

Trade partner	2018	2019	2020	2021	2022	2023
Paraguay	440	516	489	493	602	675
Uruguay	77	109	195	114	176	306
Argentina	87	118	97	63	91	46
Italy	5	5	6	6	6	5
Vietnam	**	**	1	**	**	1
Chile	**	1	0	0	0	1
Thailand	**	**	**	28	**	1
Pakistan	**	**	**	**	**	**
Portugal	**	**	**	**	1	**
India	**	**	21	18	**	**
All other	4	3	165	24	**	**
Total	614	751	975	745	877	1,036

Source: S&P Global, Total exports, HS heading 1006, rice, accessed August 2, 2024.

1133 These factors reduced the domestic supply of rice and raised consumer prices. In response, Brazil established a 400,000 mt duty-free TRQ for rice from September to December 2020 to increase domestic availability. This TRQ temporarily waived the tariff on rice originating outside of MERCOSUR. As a result, U.S. paddy rice exports to Brazil spiked during the second half of 2020. FAO, "Brazil Waves Import Tariffs on Rice," September 14, 2020; USDA, FAS, *Brazil Temporarily Removes Rice Import Tariffs*, May 23, 2024, 2; USDA, FAS, *Grain and Feed Update: Brazil*, July 1, 2022, 19–22.

1134 Much of the rice imported from Paraguay is sold in the state of São Paulo, which has about 20 percent of Brazilian consumers. Industry representative, interview by USITC staff, March 13, 2024; industry representative, interview by USITC staff, April 2, 2024; Azevedo, "Paraná é a principal porta de entrada do arroz importado pelo Brasil [Paraná is the main entry point for rice imported into Brazil]," July 21, 2024; USDA, FAS, *Grain and Feed Annual: Brazil*, April 1, 2020, 23.

1135 Industry representative, interview by USITC staff, April 2, 2024; USA Rice Federation, "Brazil Looks to Temporarily Suspend Tariffs on Rice Imports," August 27, 2020. USDA, FAS, *Grain and Feed Update: Brazil*, November 6, 2023, 28; Industry representative, interview by USITC staff, April 2, 2024; USA Rice Federation, "Brazil Looks to Temporarily Suspend Tariffs on Rice Imports," August 27, 2020.

Table 7.7 Brazil: imports of rice, by major source, 2018–23
In thousands of dollars.

Trade partner	2018	2019	2020	2021	2022	2023
Paraguay	137,472	150,593	164,691	193,249	214,770	310,180
Uruguay	35,377	42,861	89,246	54,408	83,052	173,754
Argentina	35,245	42,730	47,360	31,133	41,255	29,574
Italy	6,005	6,077	7,880	7,742	9,135	11,800
Chile	206	443	0	0	0	1,436
Vietnam	161	197	467	97	82	1,105
Thailand	178	226	343	13,144	306	517
Pakistan	152	180	209	402	301	456
Portugal	6	96	33	13	935	288
Spain	57	88	100	148	101	140
All other	2,449	1,261	66,204	16,459	51	120
Total	217,308	244,752	376,532	316,794	349,987	529,371

Source: S&P Global, Total exports, HS heading 1006, rice, accessed August 2, 2024.

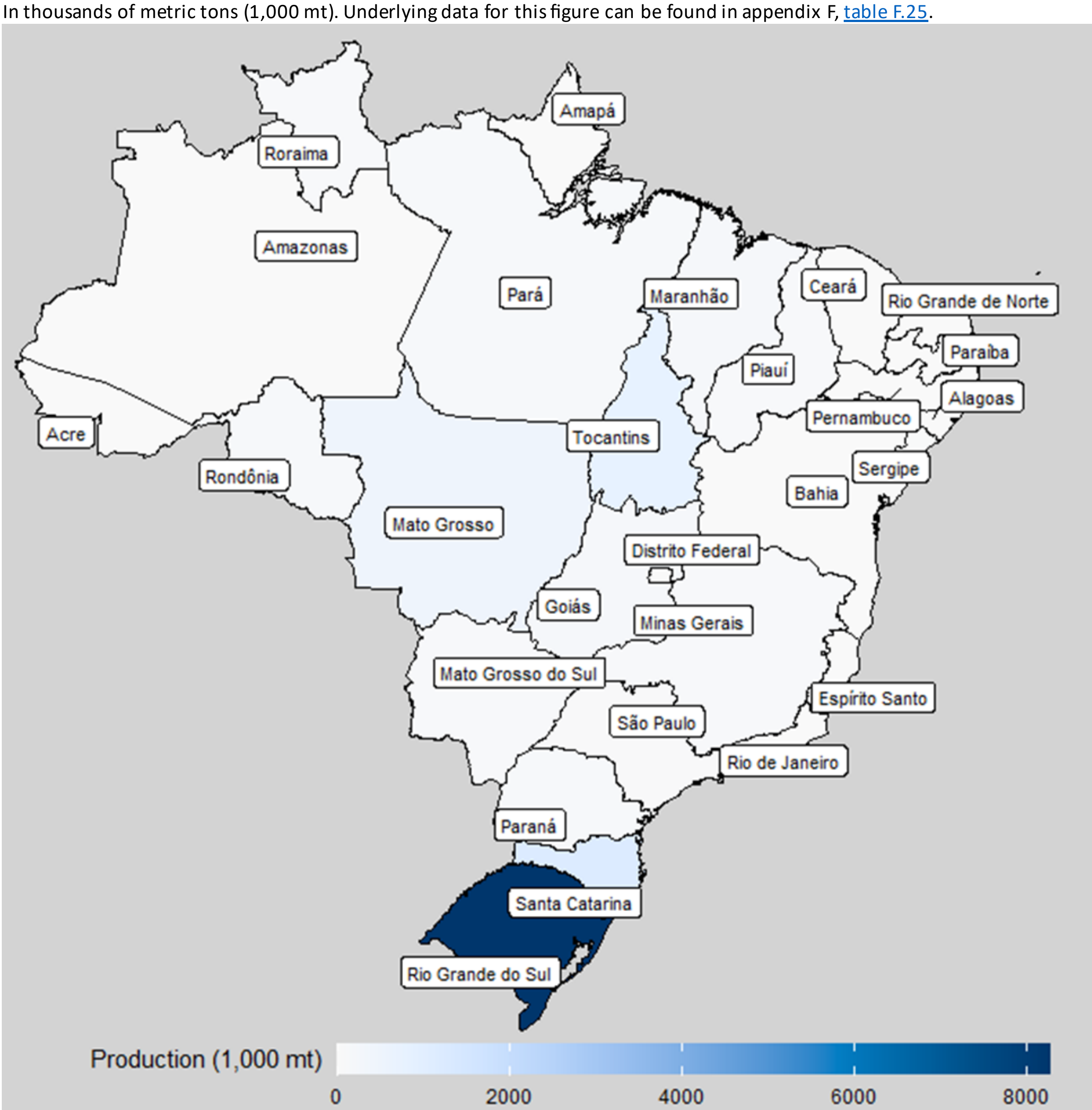
Industry Structure

Brazil's rice production is concentrated in the southern states, primarily Rio Grande do Sul and Santa Catarina (figure 7.2). Rio Grande do Sul produces approximately 70 percent of Brazil's rice and is dominated by medium-sized and large producers, usually rotating the rice crop with pasture.[1136] Santa Catarina contributes 10 percent of production, with mostly small farms organized in cooperatives engaged in both domestic and international sales.[1137] The average rice farm size is approximately 628 hectares; however, farm sizes range from 10 hectares in the northeast to more than 1,000 hectares in the south.[1138]

[1136] CONAB, "Portal de Informações Agropecuárias [Agricultural Information Portal]," accessed various dates.
[1137] CNA, "Santa Catarina Inicia Exportação de Arroz Em Casca [Santa Catarina Begins Exporting Paddy Rice]," accessed August 20, 2024; CONAB, "Portal de Informações Agropecuárias [Agricultural Information Portal]," accessed various dates.
[1138] There are 2,817 registered rice cultivators in Brazil, operating across 1.768 million ha of rice farmland, implying an average farm size of 628 ha. Global Yield Gap Atlas, "Brazil," accessed August 20, 2024; CONAB, "Portal de Informações Agropecuárias [Agricultural Information Portal]," accessed various dates.

Figure 7.2 Brazil: rice production by state, marketing year 2024/25

In thousands of metric tons (1,000 mt). Underlying data for this figure can be found in appendix F, table F.25.



Source: Companhia Nacional de Abastecimento (CONAB). "Portal de Informações Agropecuárias [Agricultural Information Portal]." accessed various dates.

Rice cultivation in Brazil uses two main production methods: irrigated, which dominates in the south, and rainfed, which occurs in Central Brazil. Irrigated rice production makes up 50 percent of land area and supplies about 90 percent of the nation's rice production. Irrigation leads to fewer fluctuations in production yields and less dependence on climatic conditions, including rainfall.[1139] Irrigated rice area

[1139] USDA, FAS, *Grain and Feed Annual: Brazil*, April 4, 2021, 21–26; CONAB, "Mapeamento Da Conab e Da ANA identifica 1,3 milhão de hectares de arroz irrigado [Mapping by CONAB and ANA identifies 1.3 million hectares of irrigated rice]," August 21, 2020.

has much higher yields than rainfed and is typically more mechanized. However, implementation costs are higher and the method relies on abundant water supplies.[1140] In Brazil, 40 percent of the volume of water collected for irrigation is used for rice.[1141] Rainfed rice produced in Central Brazil—referred to as "upland rice"—is mostly produced in the central-western and northern states (led by Mato Grosso, Maranhão, and Rondônia) and supplies about 10 percent of national production.[1142] Upland rice cultivation is generally less mechanized than irrigated rice. Upland rice area is declining, but efforts are underway at the state and national levels to improve yields for upland rice and promote rice within farm crop rotations.[1143]

Nearly all rice grown in Brazil is non-hybrid, long grain indica rice.[1144] Approximately 80 percent of rice planted in Rio Grande do Sul is one of three varieties that are resistant to weedy rice, a rice pest common in South America.[1145] Weedy rice negatively affects both rice yield and milling quality.[1146] Although interest in planting high-quality hybrid rice has been growing, as of 2015, hybrid rice only covers 5 percent of Brazil's planted area.[1147]

The benefits of efficient farm-level production in Brazil are offset, to some extent, by certain constraints in storing, milling, and transporting the product. Many Brazilian farms lack grain storage and warehousing capabilities, with only 39 percent of Brazilian farms having structures to store grain in 2023.[1148] Of those with storage capabilities, approximately 20 percent relied partially or solely on silo bags, which left grain susceptible to vermin and spoilage due to high temperatures and rain.[1149] Furthermore, rice competes with soybeans for transportation and storage space.[1150] Although storage capacity is increasing in Brazil as a result of investments from grain merchants, production continues to

[1140] Placido, "Tudo o que você precisa saber sobre plantação de arroz [Everything you need to know about rice planting]," July 2, 2021.
[1141] CONAB, "Mapeamento Da CONAB e Da ANA identifica 1,3 milhão de hectares de arroz irrigado [Mapping by CONAB and ANA identifies 1.3 million hectares of irrigated rice]," August 21, 2020.
[1142] BASF, "Produção de arroz no Brasil [Rice production in Brazil]," accessed August 20, 2024.
[1143] Placido, "Tudo o que você precisa saber sobre plantação de arroz [Everything you need to know about rice planting]," July 2, 2021; Roberto, "Arroz de terras altas [Upland rice]," March 5, 2024; Thaís de Melo Carvalho et al., "O Arroz de Terras Altas [Upland rice],"April 2020.
[1144] Revista Cultivar, "Calidad Del Arroz Producido En Brasil [Quality of rice produced in Brazil]," June 12, 2015; Avila et al., "Eighteen Years of Clearfield™ Rice in Brazil," September 2021, 1–3.
[1145] The three varieties are: Puitá INTA-CL, Guri INTA CL, and IRGA 424 RI. Muzlera, *Dictionary of Ibero-American Agriculture*, May 23, 2024; Sociedad Rural Concordia, "Gurí Inta CL and Puitá Inta CL, the Most Planted Rice Varieties in Brazil," April 29, 2016; Ribas et al., "An Update of New Flood-Irrigated Rice Cultivars in the SimulArroz Model," 2020.
[1146] Avila et al., "Eighteen Years of Clearfield Rice in Brazil," September 2021, 3.
[1147] Revista Cultivar, "Calidad Del Arroz Producido En Brasil [Quality of rice produced in Brazil]," June 12, 2015.
[1148] USDA, FAS, *Grain and Feed Update: Brazil*, November 6, 2023, 12; USDA, FAS, *Grain and Feed Annual: Brazil*, April 1, 2024, 14.
[1149] Silo bags, also known as grain bags, are large bags made of polyethylene designed to store grain, seeds, and fertilizers. They are used to store commodities on the farm for the short and medium term. Although they are convenient and cost effective, the stored commodities are more susceptible to moisture, pests, and temperature fluctuations than when stored in silos. USDA, FAS, *Grain and Feed Annual: Brazil*, April 1, 2024, 27; Polytex, "Grain Bags," accessed October 1, 2024.
[1150] USDA, FAS, *Grain and Feed Update: Brazil*, November 6, 2023, 12; USDA, FAS, *Grain and Feed Annual: Brazil*, April 1, 2024, 14.

outpace storage capacity growth.[1151] The milling industry in Brazil consists of mills of many sizes, spread throughout the growing areas. Many mills in the southern states are owned by cooperatives and tend to be modern, with high milling efficiency; mills in the northern regions tend to be less modern and less efficient.[1152]

Government Programs

Compared to many major rice-exporting countries, Brazil's agriculture sector receives relatively low levels of government support. Over time, Brazil has also trended away from market price support to other forms of government assistance, especially credit and insurance subsidies.[1153] According to Brazil's notification to the World Trade Organization (WTO) regarding domestic support, its aggregate measure of support for the agriculture sector as a whole and for the rice industry both fall below the de minimis threshold.[1154] According to the Organisation for Economic Co-operation and Development (OECD), for the Brazilian agricultural sector as a whole, the producer support estimate[1155] as a share of gross farm receipts was 3.5 percent during 2022, compared to 12.9 percent for all OECD members.[1156] Producer support estimates are not calculated for rice individually. However, the OECD provides estimates of market price support.[1157] In 2018, 2019, and 2021, the OECD reported no market price support for the Brazilian rice sector. However, it estimated sector-specific market price support at about $440 million in 2020 and 2022, about 13 percent of the value of rice production at the farm gate.[1158] While Brazil offers minimum support price programs, outlined in more detail below; these programs were largely inactive between 2018 and 2023, only triggering once during this period and only covering approximately 6 percent of rice production.

[1151] Colussi, Schnitkey, and Paulson, "Crop Production in Brazil Outpaces Storage Capacity," November 23, 2022.
[1152] U.S. government official, interview by USITC staff, August 30, 2024.
[1153] OECD, *Agricultural Policy Monitoring and Evaluation 2023*, October 30, 2023, 173.
[1154] Brazil is required to submit an annual notification in compliance with the WTO Agreement on Agriculture. However, the last period for which Brazil submitted a notification for rice under product-specific support was MY 2017/18. According to this notification, the aggregate measure of support for rice was below the de minimis threshold. WTO Secretariat, *Trade Policy Review: Brazil*, October 19, 2022, 109; WTO, "Brazil: Domestic Support Notification, 2022," April 19, 2024; WTO, "Brazil: Domestic Support Notification, 2018," February 19, 2020.
[1155] The OECD defines the producer support estimate (PSE) as "the annual monetary value of gross transfers from consumers and taxpayers to agricultural producers, measured at the farm gate level, arising from policy measures that support agriculture, regardless of their nature, objectives or impacts on farm production or income. It includes market price support, budgetary payments and budget revenue foregone, i.e., gross transfers from consumers and taxpayers to agricultural producers arising from policy measures based on: current output, input use, area planted/animal numbers/receipts/incomes (current, non-current), and non-commodity criteria." OECD, *Agricultural Policy Monitoring and Evaluation 2023*, October 30, 2023, 107.
[1156] OECD, "OECD Data Explorer," accessed October 21, 2024.
[1157] Market Price Support (MPS) is calculated as the "annual monetary value of gross transfers from consumers and taxpayers to agricultural producers arising from policy measures that create a gap between domestic market prices and border prices of a specific agricultural commodity, measured at the farm gate level. MPS is available by commodity, and sums of negative and positive components are reported separately where relevant along with the total MPS." OECD, *Agricultural Policy Monitoring and Evaluation 2023*, October 30, 2023, 107.
[1158] OECD, "OECD Data Explorer," accessed October 21, 2024.

Market price support is made available to a range of crops, including rice, and some livestock products through Brazil's Minimum Prices Guarantee Policy.[1159] Each year, minimum prices are set before the upcoming growing season by the National Monetary Council on the basis of international and domestic prices and assessments of regional production costs.[1160]

One such market price support program is operated by the state-owned the National Food Supply Agency (CONAB). The Program for Product Flow (PEP) program offers payments to commercial buyers who pay minimum fixed prices to producers.[1161] Payments are made according to the difference between the minimum price and prevailing market prices. In addition to supporting prices, PEP is used to facilitate the flow of products from regions of excess supply to regions of deficit in Brazil or to the export market.[1162] CONAB also supports prices by offering options contracts to producers and cooperatives through the Equalizing Premium Paid to Rural Producers (PEPRO) program. These contracts give rice sellers the right, but not the obligation, to sell their products to the government at a predetermined execution price (i.e., minimum support prices plus storage and financial costs) at a certain date in the future.[1163] The option to sell to the government is typically exercised when the market price falls below the execution price.[1164] Both PEP and PEPRO pay the difference between the market and minimum prices. Under PEP, this difference goes to the commercial buyer; under PEPRO, the difference goes to the producer.[1165]

Both PEP and PEPRO operated for rice in 2018. When a large crop flooded the market in MY 2017/18, domestic prices fell below the guaranteed minimum price, triggering government intervention in December 2017.[1166] Between February and March 2018, seven auctions were issued under PEPRO and five auctions under PEP seeking procurement of a total of 912,000 mt. Auctions were limited to paddy rice only and to two southern states—Rio Grande do Sul and Santa Catarina. Actual sales were 499,000 mt, representing about 4 percent of Brazil's rice production that year.[1167] In total, the Brazilian government spent over 31 million reals ($8 million) on these procurements. Despite the lack of official statistics on sales and distribution of rice acquired through PEP and PEPRO, USDA Foreign Agricultural Service (FAS) officials and other analysts have stated that most of the rice procured under these programs likely was exported.[1168] Neither PEP nor PEPRO has operated for rice since 2018.

[1159] WTO Secretariat, *Trade Policy Review: Brazil*, October 19, 2022, 115; Government of Brazil. Decree No. 57, 391, 12 December 1965, and Decree-law No. 79, 19 December 1966.
[1160] OECD, *Agricultural Policy Monitoring and Evaluation 2023*, October 30, 2023, 174.
[1161] OECD, *Agricultural Policy Monitoring and Evaluation 2021*, June 22, 2021, 149; Government of Brazil, Decree No. 57, 391, 12 December 1965, and Decree-law No. 79, 19 December 1966.
[1162] DTB Associates, LLP, *Agricultural Subsidies in Key Developing Countries*, November 2014, 37; WTO Secretariat, *Trade Policy Review: Brazil*, October 19, 2022, 116.
[1163] OECD, *Agricultural Policy Monitoring and Evaluation 2021*, June 22, 2021, 149; Government of Brazil. Decree No. 57, 391, 12 December 1965, and Decree-law No. 79, 19 December 1966.
[1164] WTO Secretariat, *Trade Policy Review: Brazil*, October 19, 2022, 116.
[1165] USDA, FAS, *Grain and Feed Annual: Brazil*, April 1, 2021, 24.
[1166] USDA, FAS, *Grain and Feed Annual: Brazil*, April 1, 2021, 24–25.
[1167] USDA, FAS, *Grain and Feed Annual: Brazil*, April 1, 2021, 24–25; CONAB, "Portal de Informações Agropecuárias [Agricultural Information Portal]," accessed various dates.
[1168] USDA, FAS, *Grain and Feed Annual: Brazil*, April 1, 2021, 25; DTB Associates, LLP, *Agricultural Subsidies in Key Developing Countries*, November 2014.

Another market price support program is a direct government purchase program operated by CONAB. Under the program, CONAB can acquire agricultural products from international channels through public auctions, as well as from domestic producers and cooperatives by accepting delivery at the minimum price when the market price is below the minimum price.[1169] However, in the case of rice, current stock levels are very low.[1170]

Brazilian agricultural producers are also supported by government programs that lower the cost of certain inputs, such as subsidized rural credit and crop insurance.[1171] According to the OECD, the most important source of government support for agriculture in Brazil is through agricultural and rural credit programs.[1172] Implemented by the Central Bank, Treasury, and Ministry of Agriculture, loans are provided to both commercial and small-scale family farms at favorable terms, including preferable rates of interest, designed to support producers otherwise excluded from the domestic financial system. Brazil also has credit programs aimed at promoting sustainable agricultural practices.[1173] The Brazilian government also aids its farmers by offering agricultural insurance support, either with subsidies on crop insurance premiums or by providing producers payments to make up for losses incurred because of natural disasters. Insurance programs are available to target both commercial and small family farms.[1174] Despite public reporting on total government expenditures on these programs across all commodities, the extent to which rice producers specifically participate and benefit from such programs is unknown.

The Brazilian government also provides general services support to its agricultural sector. According to Brazil's most recent WTO domestic support notification for 2022, measures include research; pest and disease control; and services pertaining to training, extension, inspection, marketing, promotion, and infrastructure.[1175] The extent to which Brazil's rice farmers benefit from such programs is unknown. However, government-supported research, through its research agency, the Brazilian Agricultural Research Corporation (EMBRAPA), has focused on the rice sector, including conducting extensive research to increase rice yield and cultivate varieties tolerant to various environmental constraints. In fact, EMBRAPA's breeding program has been credited with improving grain yield 0.62–0.73 percent each year for the last 45 years.[1176] Although Brazil has been able to promote yield growth, research is also being conducted to address quality concerns often found in hybrid rice varieties, such as varied grain

[1169] Salati, "Plano Safra Terá Estímulo [Safra Plan will encourage]," June 1, 2024; WTO Secretariat, *Trade Policy Review: Brazil*, October 19, 2022, 116.
[1170] In 2024, the Brazilian government authorized CONAB to acquire imported milled rice in response to flooding in Rio Grande do Sul (the state accounting for about 70 percent of domestic production) that negatively affected rice production. However, the auction was canceled due to "irregularities in the winning bidders." Cruz, "Brazilian Government Cancels Controversial Rice Auction," June 11, 2024; TV BRICS, "Brazil to Purchase Industrially Processed and Packaged Rice on International Market," May 12, 2024; Reuters, "Brazil Ag Minister Says Auction to Import Rice 'Not Necessary,'" July 3, 2024.
[1171] These programs are generally available and not linked to the production of any particular crop (i.e., non-product-specific support).
[1172] OECD, "Agricultural Policy Monitoring and Evaluation 2021," June 22, 2021, 149; WTO Secretariat, *Trade Policy Review: Brazil*, October 19, 2022, 109.
[1173] OECD, "Agricultural Policy Monitoring and Evaluation 2021," June 22, 2021, 149.
[1174] OECD, "Agricultural Policy Monitoring and Evaluation 2022," June 22, 2023, 178.
[1175] WTO, Committee on Agriculture, "Brazil: Domestic Support Notification, 2022," April 19, 2024, 3; WTO, "Brazil: Domestic Support Notification, 2022," April 19, 2024, 3.
[1176] Chakravorty, "Breeding Better Brazilian Rice," June 8, 2018; Streck et al., "Genetic Progress in 45 Years of Irrigated Rice Breeding in Southern Brazil," May 1, 2018.

lengths and chalky kernels.[1177] EMBRAPA also collaborates with the private sector and provides technical assistance to farmers.[1178] The State of Rio Grande do Sul also supports public sector research supporting the development of new varieties through the Rio Grande Rice Research Institute (IRGA). IRGA has developed some of Brazil's most widely used rice varieties and frequently collaborates with EMBRAPA.[1179]

Factors of Competitiveness

Brazil is a competitive exporter in both paddy and milled rice market segments, particularly when exporting to Mexico and Central America. Although Brazil faces high production costs, its efficient, mechanized production practices moderate these high costs to remain competitive against other exporters, especially the United States, in Mexico and Central America.[1180] While these markets are generally price sensitive, Brazil's paddy rice is regarded as high quality, meaning it offers rice with homogenous grain lengths and minimal chalkiness. Despite these advantages, Brazil's off-farm supply chain is inhibited by high transportation costs.

High Production Costs

Brazil faces high rice-production costs compared to many leading rice-exporting countries, such as India, Pakistan, and Vietnam.[1181] This limits Brazil's ability to supply rice to growing, price-sensitive regions like West Africa. However, Brazil's high levels of mechanization and high crop yields help spread fixed costs, including the costs of land, land preparation, harvesting machinery, and irrigation systems, over a larger base of production than less efficient producers. This helps reduce production costs on a per ton basis.[1182]

As a result, Brazil is cost competitive in the paddy rice market segment against other high-cost exporting countries operating highly mechanized production systems in the Western Hemisphere. For example, Brazil's largest export market for rice is Mexico, where Brazil competes with the United States and other South American countries. Average unit values of rice imports into Mexico show that Brazil has slightly lower prices compared to all other import sources, including the United States.[1183]

[1177] Industry representative, interview by USITC staff, March 25, 2024; BASF, *Guida de Híbridos de Arroz [Guide to Rice Hybrids]*, October 5, 2021.
[1178] EMBRAPA, "Embrapa Rice and Beans," accessed November 5, 2024.
[1179] Beintema, Dias Avila, and Pardey, *Agricultural R&D in Brazil: Policy, Investments, and Institutional Profile*, August 2001, 24; Revista Cultivar, "Embrapa-Irga Field Day Takes Place on 26/02," February 22, 2019.
[1180] See chapter 9 for full discussion of the U.S. competitiveness in Mexico and Central America vis-à-vis Brazil.
[1181] See chapter 3 for a cross-country comparison of costs of production.
[1182] For more information, see chapter 3.
[1183] Between 2019 and 2023, the average unit values for paddy rice into Mexico from Brazil and the United States were almost identical, with Brazil on average 2 percent lower than the United States. S&P Global, HS heading 1006, rice, accessed various dates; Industry representative, interview by USITC staff, August 27, 2024.

Participation in the Paddy Rice Market

Brazil and the United States are among the few countries that export significant quantities of paddy rice.[1184] Typically, import tariffs on paddy rice are lower than tariffs on milled rice. This allows mills to import and process paddy rice alongside domestically grown rice.[1185] Therefore, Brazil's paddy rice exports face lower trade barriers and less competition from major rice exporters that do not export large amounts of paddy rice. Exporting paddy rice also allows Brazil's rice industry to make sales without being constrained by bottlenecks in the storage and warehousing stage of the rice value chain, allowing Brazilian producers to "get rice to market as quickly as possible."[1186] Another benefit of exporting paddy rice is that it helps exporters keep costs lower when currency exchange rates are less favorable.[1187]

Brazil began exporting significant quantities of paddy rice in 2008.[1188] Since then, Brazil has become the second-largest paddy rice exporter, at $315 billion of paddy rice exports in 2023, behind the United States, at $476 billion.[1189] Brazil's paddy rice exports have grown at the expense of U.S. paddy rice exports to certain areas, including Mexico, Venezuela, and Central America.[1190] This rapid growth is due to Brazil's ability to offer paddy rice at a lower price—and according to some sources, with higher quality—than the United States.[1191] For example, the USDA Foreign Agricultural Service (FAS) in Caracas, Venezuela, reports that the United States lost a significant amount of its market share in the Venezuelan paddy rice market because of competitive pricing from South American producers, including Brazil.[1192]

High Transportation Costs in the Domestic and International Market

High transportation costs erode the competitiveness of Brazilian rice in both domestic and export markets. These high costs are the key reason Brazil imports rice from neighboring MERCOSUR countries. Under certain circumstances, it is cheaper to import rice from neighboring MERCOSUR countries than to source from domestic producers. Rice in Brazil is moved from farms to ports or domestic markets via trucks, which have limited availability[1193] and confront infrastructure problems such as bottlenecks caused by poor roads and port facilities. Such obstacles lead to significantly higher transportation costs.[1194] Cumulative value-added taxes levied when transporting rice across Brazilian state lines also

[1184] In 2023, the United States and Brazil each accounted for about one-third of global paddy rice exports. S&P Global, HS heading 1006, rice, accessed various dates.
[1185] FAO, "Rice," March 2002.
[1186] U.S. government official, interview by USITC staff, August 30, 2024.
[1187] Generally, paddy rice is cheaper than milled rice because it is less processed. When the Brazilian real appreciates relative to the importing country's currency, some producers will export paddy rice instead of milling it before export. As a result, Brazilian producers do not pass along the additional costs of milling at a less favorable exchange rate to the importer. U.S. government official, interview by USITC staff, September 12, 2024.
[1188] USITC, *Rice*, April 2015, 312.
[1189] S&P Global, HS heading 1006, rice, accessed various dates.
[1190] S&P Global, HS heading 1006, rice, accessed various dates.
[1191] Industry representative, interview by USITC staff, July 31, 2024; industry representative, interview by USITC staff, August 26–28, 2024.
[1192] A dip in Brazil's production beginning at the end of 2023 limited Brazil's exports to Venezuela and allowed U.S. exports to regain some lost market share. USDA, FAS, *Grain and Feed Annual: Venezuela*, April 11, 2024, 12.
[1193] USDA, FAS, *Grain and Feed Annual: Brazil*, April 1, 2024, 12–13; USITC, *Brazil*, 2012, 3-2.
[1194] Schnitkey, "Investments in Brazilian Grain Transportation Shrink U.S. Logistical Advantage," January 19, 2022.

raises transportation costs in the domestic market.[1195] By contrast, Uruguay's and Paraguay's value-added taxes are not cumulative, which means that the tax burden can be significantly lower relative to Brazil's.[1196]

Brazil's high internal transportation costs also affect its export competitiveness in Mexico in contrast to the United States, which can ship to Mexico at low cost.[1197] This gives the United States a logistics advantage, which was especially pronounced when containers were scarce during the COVID-19 pandemic.[1198] In response, the Brazilian government is investing in infrastructure improvements for grain transportation and politicians have made commitments to reform Brazil's value-added tax system. If these efforts are successful, internal transportation costs for Brazilian rice may decline in the future.[1199]

Uruguay

Uruguay's rice industry is nearly entirely export oriented. Production is small compared to many other major exporters, but nearly all of it is exported, making Uruguay the 10th-largest rice exporter in the world in 2023.[1200] Uruguay primarily exports milled long grain, nonaromatic rice to other Western Hemisphere countries, although brown rice exports are on the rise. Uruguay's exports are high due to negligible domestic consumption, efficient production processes from large agribusinesses, and rice with characteristics desired in export markets. Uruguay's rice industry has some of the highest yields globally and one of the strongest reputations for quality in the long grain nonaromatic market segment. These achievements come from coordination across all steps of Uruguay's supply chain and research from the public and private sectors. However, the industry's growth is constrained by land availability and rising irrigation costs.

Production

Uruguay produced 900,000 mt of rice in MY 2023/24, making it the 35th-largest producer in the world with a global share of 0.2 percent.[1201] Between MY 2018/19 and MY 2023/24, production rose about 1.4 percent annually, mostly because of favorable weather conditions, which increased annual yields (table 7.8). Despite relatively steady production, producers in Uruguay reported high costs during this period. These high costs, along with competition from Paraguay's growing rice industry, have pushed some producers to exit Uruguay's rice industry and enter Paraguay's.[1202]

[1195] Industry representative, interview by USITC staff, April 4, 2024.
[1196] Revillion and de Souza, "Rice Production in Mercosur Seen through a Policy Analysis Matrix," April 5, 2023, 58; U.S. government official, interview by USITC staff, August 30, 2024.
[1197] Industry representative, interview by USITC staff, August 26–28, 2024.
[1198] MercoPress, "Brazilian Rice Exports Booming," May 31, 2022.
[1199] USDA, FAS, *Grain and Feed Annual: Brazil*, April 1, 2024, 14–15; U.S. government official, interview by USITC staff, August 30, 2024; Schnitkey, "Investments in Brazilian Grain Transportation Shrink U.S. Logistical Advantage," January 19, 2022.
[1200] USDA, FAS, PSD Online database, accessed March 13, 2024.
[1201] USDA, FAS, PSD Online database, accessed March 13, 2024.
[1202] USDA, FAS, *Grain and Feed Annual: Uruguay*, April 9, 2019, 5.

Rice yields, at about 9 mt/ha, are among the highest in the world, partly because of government investments in developing high-yield and high-quality rice varieties.[1203] The harvested area during this time frame fluctuated little at close to 145,000 hectares annually. Most rice varieties grown in Uruguay are long grain, japonica rice developed domestically and optimized for yield and quality.[1204]

Table 7.8 Uruguay: production, consumption, stocks, and trade, for marketing years 2018/19–2023/24
In metric tons (mt), hectares (ha), kilograms (kg), metric tons per hectare (mt/ha), and percentages (%), by marketing year.

Attribute	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
Beginning stocks (1,000 mt)	107	61	12	113	71	98
Production (milled) (1,000 mt)	840	846	916	974	965	900
Area harvested (1,000 ha)	145	140	139	151	145	145
Yield (rough) (mt/ha)	8.3	8.6	9.4	9.2	9.5	8.9
Imports (1,000 mt)	0	0	0	0	0	0
Consumption and residual (1,000 mt)	40	30	30	30	40	50
Exports (1,000 mt)	846	865	785	986	898	850
Ending stocks (1,000 mt)	61	12	113	71	98	98
Exports-to-production ratio (%)	100.7	102.2	85.7	101.2	93.1	94.4
Ending stocks-to-use ratio (%)	6.9	1.3	13.9	7.0	10.4	10.9
Per capita consumption (kg)	11.7	8.8	8.7	8.8	11.7	15.0

Source: USDA, FAS, PSD Online database, accessed September 13, 2024; World Bank, Data: Population, accessed September 13, 2024.
Note: The marketing year is from April through March of the following year. For example, marketing year 2018/19 is from April 2019 through March 2020. Per capita consumption was calculated using marketing-year apparent consumption divided by calendar year population. All other data, including imports and exports, are based on the marketing year.

Consumption and Stocks

Rice consumption in Uruguay, as noted earlier, is low, both in total and on a per capita basis. Instead, wheat-based products are the main sources of starch in typical diets in Uruguay.[1205] With little domestic demand, Uruguay has one of the most export-oriented rice industries, with about 94 percent of rice production destined for the export market in MY 2023/24 (table 7.8). Rice stocks are small in Uruguay and nearly all privately held by millers.[1206]

Trade

In 2023, Uruguay exported 1.1 million mt of rice and was the 10th-largest exporter, with a global export share of about 2.0 percent (by volume) (tables 7.9 and 7.10).[1207] Uruguay's exports in 2023 were about 34 percent higher than in 2018. During 2018–23, Uruguayan rice exports grew about 6 percent annually. In 2023, close to one-half of its exports were to South America (Brazil, Peru, Venezuela) and Mexico,

[1203] Zorrilla, "Uruguayan Rice," January 1, 2015.
[1204] Rebollo et al., "Consolidating 23 Years of Historical Data from an Irrigated Subtropical Rice Breeding Program in Uruguay," 2023, 2; GMA, "Exports," accessed August 28, 2024.
[1205] In 2022, wheat accounted for approximately 23 percent of calories available for consumption per day, while rice accounted for less than 3 percent. FAO, "FAOSTAT: Food Balances," accessed various dates.
[1206] USDA, FAS, *Grain and Feed Annual: Uruguay*, April 18, 2024, 7.
[1207] USDA, FAS, "PSD Online database," accessed March 13, 2024.

mostly of long grain milled rice.[1208] By volume, 45 percent of Uruguay's exports were to other MERCOSUR member states, MERCOSUR-associated states, and Venezuela in 2023.[1209]

Uruguay's paddy rice exports are increasing (mostly to Costa Rica, Panama, and Venezuela), as are exports of brown rice, mostly to the EU.[1210] Iraq has been an important market, but with large fluctuations between years. These fluctuations are due to high freight and shipping costs and price competition from Thailand.[1211] Because of the growth of rice production and exports in Paraguay, Uruguay's rice exports are facing increased competition in MERCOSUR export markets, particularly in Brazil.[1212] Uruguay imported negligible quantities of rice.

Table 7.9 Uruguay: exports of rice, by destination market, 2018–23
In thousands of metric tons. ** = rounds to zero.

Trade partner	2018	2019	2020	2021	2022	2023
Brazil	76	110	196	111	176	298
Panama	0	**	102	**	**	94
Venezuela	57	107	1	82	155	93
Belgium-Luxembourg	29	25	32	53	41	89
Mexico	81	108	118	81	199	78
Peru	180	160	181	105	53	74
Costa Rica	24	42	23	11	110	64
Spain	6	4	9	8	24	49
Iraq	218	62	4	128	25	34
United Kingdom	14	12	34	27	46	33
All others	145	242	333	155	266	201
Total	829	872	1,032	761	1,096	1,108

Source: S&P Global, Total exports, HS heading 1006, rice, accessed August 2, 2024.

[1208] As discussed in the Regional Overview section, Uruguay exports rice duty free to MERCOSUR member states.
[1209] Venezuela is currently suspended from MERCOSUR. S&P Global, HS heading 1006, rice, accessed various dates; MERCOSUR, "MERCOSUR Countries," accessed April 11, 2024.
[1210] S&P Global, Total exports, HS heading 1006, rice, accessed August 2, 2024.
[1211] USDA, FAS, *Grain and Feed Annual: Uruguay*, April 11, 2022, 9; Thomas, Storey, and Fox, "Iraq Emerges to Dominate Thai White Rice Market," May 24, 2022.
[1212] Industry representative, interview by USITC staff, April 2, 2024; USDA, FAS, *Grain and Feed Annual: Uruguay*, March 30, 2023, 9; USDA, FAS, *Grain and Feed Annual: Uruguay*, April 9, 2019, 5.

Table 7.10 Uruguay: exports of rice, by destination market, 2018–23
In thousands of dollars.

Trade partner	2018	2019	2020	2021	2022	2023
Brazil	36,110	44,352	91,894	53,677	84,868	171,542
Peru	98,379	82,203	96,179	64,601	29,560	48,253
Belgium-Luxembourg	11,787	10,456	12,884	25,958	19,923	47,938
Mexico	40,545	46,385	48,267	36,451	97,558	43,596
Venezuela	19,351	30,313	255	29,228	53,002	37,791
Panama	0	164	29,847	139	113	36,996
Costa Rica	11,627	16,426	12,244	6,402	35,376	28,219
Spain	2,776	1,836	4,165	3,869	11,698	27,861
Iraq	104,542	27,404	2,149	71,981	11,875	19,530
Cuba	6,830	23,105	37,072	0	26,640	19,080
All other	61,965	78,634	127,589	90,225	123,969	114,619
Total	393,913	361,277	462,545	382,531	494,581	595,424

Source: S&P Global, Total exports, HS heading 1006, rice, accessed August 2, 2024.

Industry Structure

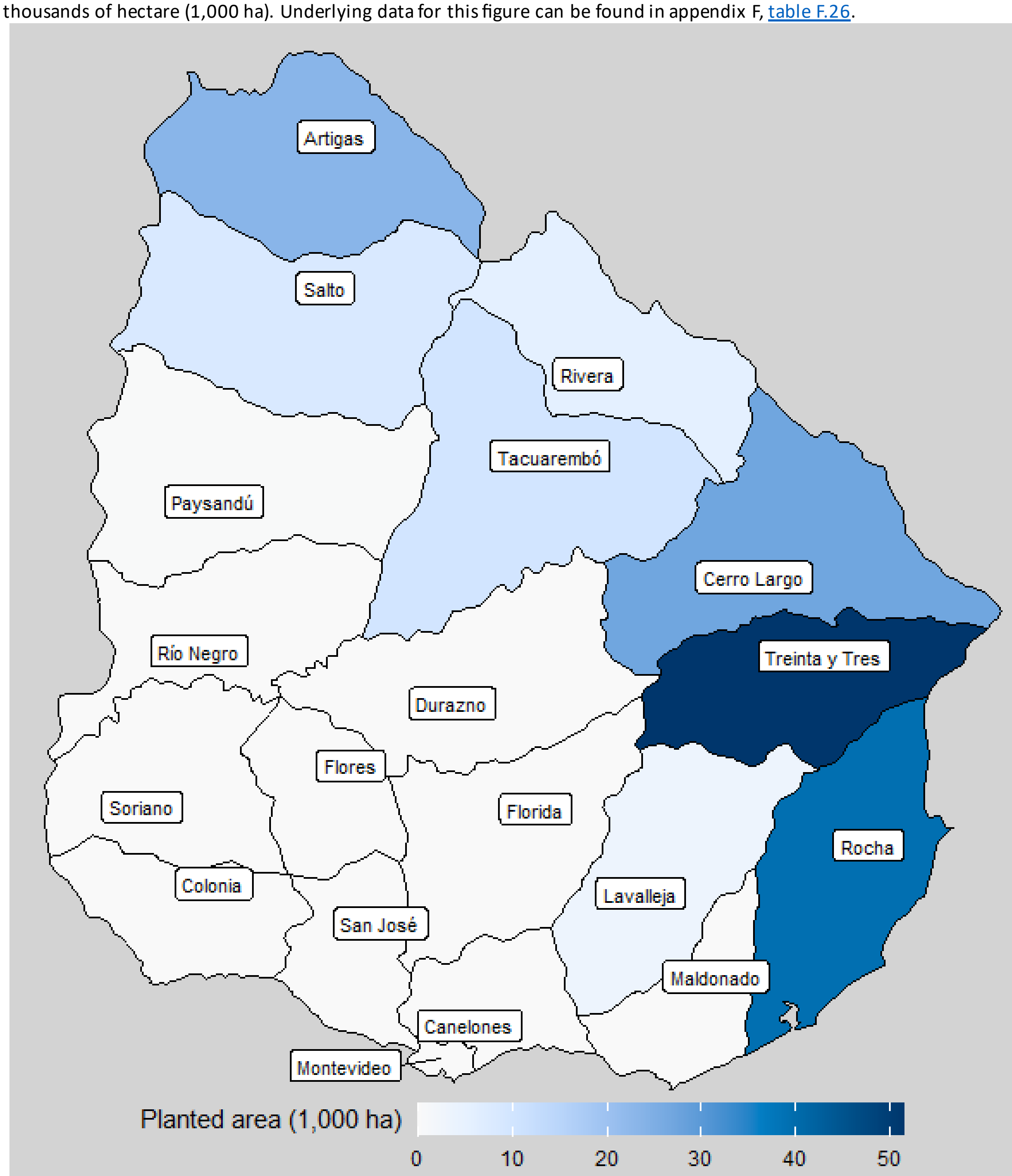
Rice production in Uruguay is efficient, high yield, highly mechanized, and entirely irrigated.[1213] Uruguay produces a single crop each year, sown in early October and harvested in March–April. Production is characterized by the use of high-yielding cultivars; application of advanced agronomic techniques—including direct seeding, which is considered one of the most efficient and sustainable planting methods—and effective soil, fertilizer, and pesticide management.[1214] Uruguayan producers also have a tradition of crop rotation between rice and pasture, which increases productivity and reduces the need for nitrogen-based fertilizers.[1215] These methods reduce costs for water, electricity, and other inputs. As a result, rice yields in Uruguay, which moderate unit production costs, are among the highest in the world.[1216]

The average farm size in Uruguay is 400 hectares.[1217] Most rice farms are in the eastern part of the country, which has easy access to coastal ports, but some rice is also grown in the northern regions (figure 7.3).

[1213] Carracelas et al., "Distinguishing between Yield Plateaus and Yield Ceilings," March 1, 2023.
[1214] Direct-seeding involves planting seeds directly into the field, instead of transplanting seedlings. Direct-seeding uses less water and labor than transplanting. IRRI, "What Is DSR?," 2018; Carracelas et al., "Distinguishing between Yield Plateaus and Yield Ceilings: A Case Study of Rice in Uruguay," March 1, 2023, 4.
[1215] Castillo et al., "The Nitrogen Economy of Rice-Livestock Systems in Uruguay," August 10, 2021.
[1216] Carracelas et al., "Distinguishing between Yield Plateaus and Yield Ceilings," March 1, 2023, 1.
[1217] U.S. government official, interview by USITC staff, September 12, 2024.

Figure 7.3 Uruguay: rice production zones, marketing year 2022/23

In thousands of hectare (1,000 ha). Underlying data for this figure can be found in appendix F, table F.26.



Source: Government of Uruguay, Ministry of Livestock, Agriculture, and Fisheries, "Relevamiento de chacras de arroz zafra 2022/2023 [Survey of Rice Fields for the 2022/23 Harvest]." accessed November 1, 2024.

Rice milling is coordinated through the Gremial de Molinos Arroceros (GMA), an industry association representing eight mills responsible for nearly all rice milling and export.[1218] Mills also provide support services for growers, as well as access to high-quality inputs and technological innovations. SAMAN, a subsidiary of Brazilian company Camil, is the largest mill in Uruguay and accounts for close to half Uruguayan rice production.[1219] SAMAN, like other mills in Uruguay, sources rice from farmers through contract arrangements.[1220]

The Asociación de Cultivadores de Arroz, which represents 85–90 percent of growers, and GMA negotiate a fixed, provisional price at which most rice is purchased. Mills pay producers a deposit for a portion of rice at this price, and the price for the remainder is set on the spot market. This agreement gives producers liquidity and helps all parties plan finances.[1221]

Coordination across the supply chain ensures that rice produced in Uruguay is of high quality in terms of consistent grain length and minimal chalkiness. Uruguay is a global leader in cultivar development—most of which was developed by Uruguay's National Institute of Agricultural Research (INIA)—and industry uptake of certified seed is high.[1222] High standards for such cultivars facilitate efficient, homogeneous milling and certification ensures a baseline quality threshold is met.[1223] Although hybrid varieties occupy less than 10 percent of Uruguay's planted area, they are reportedly of a high quality.[1224] In addition, millers coordinate with producers to grow specific varieties of rice in accordance with customer orders. These varieties are kept separate across harvesting, milling, and export activities.[1225]

Government Programs

Uruguay's government support for the agriculture sector is minimal. According to Uruguay's WTO notifications under the Agreement on Agriculture, most of its domestic support is provided for pest and disease control ($47.2 million in 2020), infrastructure services ($29.5 million in 2020), and research

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[1218] Industry representative, interview by USITC staff, April 2, 2024; Gremial de Molinos Arroceros (GMA). "Exports." Accessed August 28, 2024; Zorrilla, "Existe conformidad por el precio definitivo del arroz [There is agreement on the final price of rice]," April 23, 2022.
[1219] Camil, "Strategy and Competitive Advantages," September 10, 2024; SAMAN, "El Arroz Apreciado en el Mundo [the rice appreciated in the world]," accessed October 1, 2024.
[1220] Industry representative, interview by USITC staff, April 2, 2024; U.S. government official, interview by USITC staff, September 12, 2024.
[1221] Zorrilla, "Existe conformidad por el precio definitivo del arroz [There is agreement on the final price of rice]," April 23, 2022; Agrositio, "Precio definitivo del arroz podrá superar al provisorio [Final price of rice may exceed provisional price]," September 8, 2023; Verde News, "Ajuste en fijación de precio del arroz, con un 20% a comercializar en sistema tipo spot, anunció Lago (ACA) [Adjustment in rice pricing, with 20% to be marketed in spot system, announced Lago (ACA)]," November 14, 2023.
[1222] "Uruguay Stepping into Strong Position on Global Seed Stage," February 6, 2024; Rebollo et al., "Consolidating 23 Years of Historical Data from an Irrigated Subtropical Rice Breeding Program in Uruguay," 2023, 2.
[1223] BBC News, "El enigma del arroz uruguayo [The enigma of Uruguayan rice]," October 24, 2012; Lanfranco et al., "Setting Transformational Pathways Consistent with Post-2015 SDGs," 2018, 7.
[1224] Tseng et al., "Field-Level Factors for Closing Yield Gaps," May 1, 2021; U.S. government official, interview by USITC staff, September 12, 2024.
[1225] Global Yield Gap Atlas, "Uruguay," accessed August 28, 2024; Ministerio de Ganaderia, Agricultura y Pesca Oficina de Estadisticas Agropecuarias, *Encuesta de Arroz [Rice survey]*, September 2019, 4; Tseng et al., "Field-Level Factors for Closing Yield Gaps," May 1, 2021; U.S. government official, interview by USITC staff, August 22, 2024.

($29.0 million in 2020).[1226] Given the export orientation of the industry, government policies focus on supporting the rice sector's productivity levels, particularly through extensive investment in research and development.[1227] Public sector research—including the development of new varieties, chemicals management, and farming practices—is conducted by INIA.[1228] The government of Uruguay provides half of INIA's funding, and producers provide the other half in exchange for technical assistance.[1229]

Factors of Competitiveness

Uruguay's rice industry is organized and efficient, leading to both low costs of production and investment across the rice value chain. Through concerted efforts from rice producers, millers, and researchers, Uruguay has a reputation of exporting high-quality long grain rice. This enhances Uruguay's competitiveness in export markets. However, rice production in Uruguay has not increased significantly over the 2018–23 period because of land and water constraints and leveling yields. This trend suggests that the growth potential for Uruguay's rice industry may be limited.

Efficient, Low-Cost Production

Uruguay produces cost-competitive, high-quality rice. Production costs in MY 2023/24 were estimated at about $220 per metric ton, which is significantly lower than in Brazil, the United States, and many Asian rice-exporting countries.[1230] Its low cost per metric ton stems from a highly efficient production system that benefits from economies of scale, high-quality inputs, and technological innovations, as well as irrigation. Rice yields in Uruguay are also among the highest in the world, which further moderate production costs when measured on the basis of costs per metric ton of rice production. A favorable industry structure, in which mills enter price-setting agreements with and provide support services for growers, promotes investment in efficient production practices.[1231] Also, as a small country with a large coastline, Uruguay enjoys easier transportation and port access than many other rice-producing countries. Lastly, technical assistance from INIA promotes yield growth and efficient production, which further lowers unit costs for rice.

Although rice production was mostly profitable for growers during 2018–23, returns were strongly influenced by external factors, such as the prices of inputs (e.g., fertilizers, chemicals, and energy), freight costs, and exchange rate fluctuations that impact both sales prices and input costs, which are

[1226] WTO, Committee on Agriculture, "Uruguay: Domestic Support Notification, 2024," September 27, 2023.
[1227] Lanfranco et al., "Setting Transformational Pathways Consistent with Post-2015 SDGs," 2018, 3; Government of Uruguay, written submission to the USITC, February 27, 2024.
[1228] Lanfranco et al., "Setting Transformational Pathways Consistent with Post-2015 SDGs," 2018, 7, 11–12, 21.
[1229] Global Forum on Agricultural Research and Innovation, "The Enigma of Uruguayan Rice," October 25, 2012.
[1230] For more information about costs of production in different countries, see chapter 3.
[1231] Agrositio, "Precio definitivo del arroz podrá superar al provisorio [Final price of rice may exceed provisional price]," September 8, 2023; Verde News, "Ajuste" en fijación de precio del arroz, con un 20% a comercializar en sistema tipo spot, anunció Lago (ACA) ["Adjustment" in rice pricing, with 20% to be marketed in spot system, announced Lago (ACA)]," November 14, 2023.

mostly denominated in U.S. dollars and established in international markets.[1232] In some cases, these cost pressures have led to mill closures, a reduction in the number of rice producers, and entry into Paraguay, where profits are higher.[1233]

Organized, Efficient Industry

Uruguay's efficient, organized industry supports the production of high-quality rice at a price that is competitive with other South American suppliers. This allows Uruguay to compete with the United States and South American suppliers in Central America, where buyers are price sensitive but also demand high-quality products. For example, after Costa Rica reduced its import tariffs on rice in 2022, Costa Rican buyers reportedly chose rice from Uruguay and Brazil instead of the United States because of its combination of price and quality, despite longer shipping times.[1234] Uruguay's success in rice quality, discussed below, is a result of coordination across Uruguay's rice industry to harmonize private sector branding efforts and prevent commingling across the supply chain. Uruguay's unique price-setting agreements between farmers and millers also promote investment by providing financial stability to make capital investments in advanced production, harvesting, and milling technologies.[1235]

Reputation for High-Quality Rice

South America's rice is generally of high quality, but rice from Uruguay has a reputation for being the highest quality. This is due to efforts from Uruguay's rice industry starting in the 1970s to export "unmixed" rice, meaning that different varieties are not commingled.[1236] This reputation has reportedly been reinforced by a robust seed certification process and mills promoting their rice as "Uruguayan" instead of advertising their own brand.[1237] Because of these quality standards, rice from Uruguayan suppliers is well received in Central America.[1238] In addition to selling an unmixed product, Uruguayan

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[1232] In response to rising costs, Uruguay has started exporting paddy rice. Lower prices for Thai milled rice also threaten Uruguay's market position in Iraq. U.S. government official, interview by USITC staff, September 12, 2024; Industry representative, interview by USITC staff, April 2, 2024; Malheiros, "Uruguay Processing Industry Suffers," June 20, 2023; Thomas, Storey, and Fox, "Iraq Emerges to Dominate Thai White Rice Market," May 24, 2022; USDA, FAS, *Grain and Feed Annual: Uruguay*, April 11, 2022, 9; ACA, "Costos productivos de la zafra pasada fueron los 'más caros de los últimos años' [Production costs of the last harvest were the 'most expensive in recent years'],'' November 22, 2023.
[1233] USDA, FAS, *Grain and Feed Annual: Uruguay*, April 9, 2019, 5; ACA, "Costos productivos de la zafra pasada fueron los 'más caros de los últimos años' [Production costs of the last harvest were the 'most expensive in recent years'],'' November 22, 2023.
[1234] USDA, FAS, *CORRECTED Costa Rica Rice Situation Update*, August 30, 2023, 7. For more information on competition between rice from the United States and rice from South America, see chapter 9.
[1235] Agrositio, "Precio definitivo del arroz podrá superar al provisorio [Final price of rice may exceed provisional price]," September 8, 2023; Verde News, "'Ajuste' en fijación de precio del arroz, con un 20% a comercializar en sistema tipo spot, anunció Lago (ACA) ["'Adjustment' in rice pricing, with 20% to be marketed in spot system, announced Lago (ACA)]," November 14, 2023.
[1236] USITC, *Rice*, April 2015, 318.
[1237] U.S. government official, interview by USITC staff, September 12, 2024; USITC, *Rice*, April 2015, 318–20.
[1238] USDA, FAS, *CORRECTED Costa Rica Rice Situation Update*, August 30, 2023, 7; FarmProgress, "Rice Quality at Heart of U.S. Market Share Woes," January 3, 2024.

millers work with producers to comply with demanding sanitary and phytosanitary requirements, minimum residual limits regulations, and other quality standards.[1239]

Constraints on Expanding Capacity

Although able to produce high-quality, competitively priced rice, the Uruguayan industry has limits on how far it can expand. Some researchers argue that Uruguay has reached its "yield plateau": Yields are already high, very little suitable rice-growing land remains unplanted, and the scarcity of water in Uruguay would limit further plantings even if land were available.[1240] Droughts in Uruguay have also strained reservoirs for irrigation and led to water security issues. In some cases, this led to political opposition to agribusinesses.[1241] These constraints, along with rising production costs—particularly irrigation and rental costs—have pushed some producers to expand production in Paraguay instead of Uruguay.[1242]

Paraguay

Like Uruguay's, Paraguay's rice industry is almost entirely export oriented. However, Paraguay's exports are less diversified than Uruguay's, with nearly all rice destined for Brazil. Most rice varieties grown in Paraguay are long grain, nonaromatic varieties developed in Brazil and well suited to the Brazilian market. Like other industries in its agriculture sector, Paraguay's rice industry is growing quickly, driven by low land and irrigation costs. These low costs have also attracted private sector investment from neighboring MERCOSUR countries. Paraguay's rice industry is vertically integrated and characterized by large—and expanding—agribusinesses. However, Paraguay's reliance on the Brazilian export market exposes Paraguay's rice industry to risk.

Production

Paraguay produced 860,000 mt of rice in MY 2023/24, making it the 38th-largest producer, with a global share of 0.2 percent (table 7.11).[1243] Between MY 2018/19 and MY 2023/24, production grew by about 3.7 percent annually, mostly as a result of increased area planted, which increased by 3.5 percent over this time frame.[1244] The rise in planted area is associated with several factors, including investors increasing land purchases and converting more area for rice production, high regional prices following weather-related production shortfalls in Brazil and Argentina, and a sharp drop in costs of fertilizer and

[1239] GMA, "Exports," accessed August 28, 2024; U.S. government official, interview by USITC staff, September 12, 2024.
[1240] Carracelas et al., "Distinguishing between Yield Plateaus and Yield Ceilings," March 1, 2023.
[1241] Obaldia, O'Boyle, and Coates, "In Parched Uruguay, Tensions Rise as Water Levels Fall," June 30, 2023; Wadhwa, "Uruguayan Environmentalists Blame Agribusiness and Government for Current Water Crisis," July 13, 2023; Martinez, "Running Dry," October 20, 2023.
[1242] Industry representative, interview by USITC staff, April 4, 2024; USDA, FAS, *Grain and Feed Annual: Uruguay*, April 9, 2019, 5.
[1243] USDA, FAS, PSD Online database, accessed March 13, 2024.
[1244] USDA, FAS, PSD Online database, accessed March 13, 2024

chemical inputs making rice production more attractive.[1245] A drought in marketing year 2021/22 negatively affected production and yield, but production recovered during the next crop year.[1246]

Table 7.11 Paraguay: rice production, consumption, stocks, and trade, marketing years 2018/19–2023/24

In metric tons (mt), hectares (ha), kilograms (kg), metric tons per hectare (mt/ha), and percentages (%), by marketing year.

Attribute	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
Beginning stocks (1,000 mt)	115	91	38	147	75	23
Production (milled) (1,000 mt)	718	798	793	725	850	860
Area harvested (1,000 ha)	164	182	180	170	190	195
Yield (rough) (mt/ha)	6.5	6.5	6.6	6.4	6.7	6.6
Imports (1,000 mt)	2	2	1	0	0	0
Consumption and residual (1,000 mt)	55	50	45	45	45	45
Exports (1,000 mt)	689	803	640	752	857	800
Ending stocks (1,000 mt)	91	38	147	75	23	38
Exports-to-production ratio (%)	96.0	100.6	80.7	103.7	100.8	93.0
Ending stocks-to-use ratio (%)	12.2	4.5	21.5	9.4	2.5	4.5
Per capita consumption (kg)	8.5	7.7	6.8	6.7	6.6	6.6

Sources: USDA, FAS, PSD Online database, accessed March 13, 2024; World Bank Open Data: Population, accessed March 27, 2024.
Note: Per capita consumption was calculated using marketing-year apparent consumption divided by calendar year population. All other data, including imports and exports, are based on the marketing year.

Consumption and Stocks

In MY 2023/24, per capita rice consumption was less than 7 kilograms, significantly less than many other countries in the region. In recent years, rice consumption has been stable at 45,000 mt annually (table 7.11). Like in Uruguay, rice is not a staple starch-based food in the Paraguayan diet; instead, corn and cassava are traditionally consumed.[1247] Like in Uruguay, rice stocks are small and privately held.[1248]

Trade

In 2023, Paraguay exported about 911,000 mt and was the 11th-largest exporter, with a global share of 1.5 percent (by volume).[1249] During 2018–23, Paraguayan rice exports increased by about 5 percent annually (tables 7.12 and 7.13). Brazil was by far the most important destination, contributing about three-quarters of all exports in 2023, followed by Chile, with a 13 percent share. Other destinations for Paraguayan rice include Central American, European, and West African countries. About 50 percent of exports are of white rice and 30 percent are of brown rice; broken rice and a small amount of paddy rice

[1245] USDA, FAS, *Grain and Feed Annual: Paraguay*, April 19, 2023.
[1246] Government of Paraguay, MAG, written submission to the U.S. International Trade Commission in connection with *Rice: Global Competitiveness and Impacts on Trade and the U.S. Industry*, July 12, 2024, 7.
[1247] In 2022, corn and cassava accounted for approximately 42 percent of calories available for consumption per day in a typical Paraguayan diet, while rice accounted for 1.2 percent. FAO, "FAOSTAT: Food Balances," accessed various dates.
[1248] Foreign government official, interview by USITC staff, October 2, 2024.
[1249] USDA, FAS, PSD Online database, accessed March 13, 2024.

account for the remainder.[1250] According to PSD data, Paraguayan imports of rice were minimal during this period.

Table 7.12 Paraguay: exports of rice, by major market, 2018–23
In thousands of metric tons.

Trade partner	2018	2019	2020	2021	2022	2023
Brazil	430	521	496	497	612	685
Chile	55	47	79	55	88	121
Guatemala	3	6	41	2	1	29
Gambia	28	16	13	6	3	15
United Kingdom	1	1	3	7	6	14
Costa Rica	10	12	13	6	1	11
Sierra Leone	10	19	24	8	4	7
Portugal	11	11	10	12	6	6
Guinea-Bissau	1	0	0	0	0	4
El Salvador	0	0	21	0	1	4
All others	159	105	204	100	102	13
Total	707	738	903	693	824	911

Source: S&P Global, Total exports, HS heading 1006, rice, accessed August 2, 2024.

Table 7.13 Paraguay: exports of rice, by major market, 2018–23
In thousands of dollars.

Trade partner	2018	2019	2020	2021	2022	2023
Brazil	131,134	152,193	168,730	191,935	218,659	317,534
Chile	17,358	14,955	28,733	23,340	34,088	56,315
Guatemala	1,103	1,738	10,028	802	451	9,251
United Kingdom	237	254	1,074	3,009	2,143	6,327
Costa Rica	4,436	4,960	4,901	2,966	621	5,794
Gambia	7,021	3,876	3,117	1,769	691	5,013
El Salvador	0	0	5,256	0	437	2,424
Portugal	3,850	3,668	3,196	4,785	2,261	2,352
Sierra Leone	2,757	4,610	6,476	2,458	1,257	2,320
Netherlands	861	1,468	2,662	6,250	1,213	1,429
All other	50,470	38,933	60,834	36,560	31,529	6,122
Total	219,225	226,655	295,007	273,875	293,351	414,880

Source: S&P Global, Total exports, HS heading 1006, rice, accessed August 2, 2024.

Industry Structure

Paraguay's rice industry is relatively new compared to those of Brazil and Uruguay, but Paraguay has rapidly increased production to become a major exporting country to the world market. Rising costs, plateauing yields, and droughts elsewhere in South America have prompted Uruguayan and Brazilian producers to invest in Paraguay's rice sector.[1251] Paraguay's rice industry attracts investment with low

[1250] S&P Global, Total exports, HS heading 1006, rice, accessed August 2, 2024.
[1251] Dry weather in Paraguay has also raised costs for producers. Gateway to South America, "Paraguay Has Potential for More Rice Production," December 3, 2022; USDA, FAS, *Grain and Feed Annual: Paraguay*, April 15, 2022, 7; "Uruguay Farm Sellers Buy in Paraguay Hoping to Repeat Their Earlier Success," March 7, 2015; Lyddon, "Focus on Paraguay," August 2, 2021; Lanfranco et al., "Setting Transformational Pathways Consistent with Post-

taxes; ample water for irrigation; and low costs for land, labor, and energy.[1252] Although the industry is still in its early development phase, government officials in Paraguay have voiced aspirations to become a world leader in rice production.[1253]

Paraguayan rice production is centered in the southeast of the country in the political departments of Itapúa, Misiones, Caazapá, and Ñeembucú (figure 7.4). Production in these areas is irrigated by three water basins, with the Tebicuary River Basin supplying the most water for rice production.[1254] Itapúa and Misiones are the largest producers, accounting for about one-third and one-quarter of Paraguay's total production, respectively.[1255] Rice production is expanding most rapidly along the Paraguay River because of agribusinesses establishing large farms—in some cases more than 1,000 hectares.[1256] The planted area for irrigated rice has increased more than 31 percent—from 120,000 hectares in MY 2013/14 to 158,000 hectares in MY 2022/23.[1257] At the same time, the number of small and medium-sized farms in Paraguarí is declining because of problems with drought and a lack of irrigation.[1258] Several investments to expand rice production in other areas of the country are ongoing. For example, following significant investment, rice is now being produced in the semiarid central areas of the Bajo Chaco.[1259] Yields in these areas are estimated as high as 10 mt/ah, significantly above the national average of 6.5 mt/ha.[1260]

2015 SDGs," 2018; USDA, FAS, *Grain and Feed Annual: Uruguay*, April 9, 2019, 5; Rio Times Staff Reporters, "Brazil's Camil Expands Reach with Strategic Acquisition," September 6, 2024. Industry representative, interview by USITC staff, April 4, 2024.

[1252] U.S. government official, interview by USITC staff, September 12, 2024.

[1253] Amigo Camionero, "Producción de arroz crece en el Chaco y Paraguay apunta a ser líder mundial [Rice production grows in the Chaco and Paraguay aims to be a world leader]," January 26, 2024.

[1254] Government of Paraguay, MAG, Written submission to the U.S. International Trade Commission in connection with *Rice: Global Competitiveness and Impacts on Trade and the U.S. Industry*, July 12, 2024, 9.

[1255] Government of Paraguay, MAG, Written submission to the U.S. International Trade Commission in connection with *Rice: Global Competitiveness and Impacts on Trade and the U.S. Industry*, July 12, 2024, 9.

[1256] U.S. government official interview by USITC staff, September 12, 2024; USDA, FAS, *Grain and Feed Annual: Paraguay*, April 9, 2021, 6.

[1257] Government of Paraguay, MAG, written submission to the U.S. International Trade Commission in connection with *Rice: Global Competitiveness and Impacts on Trade and the U.S. Industry*, July 12, 2024, 4.

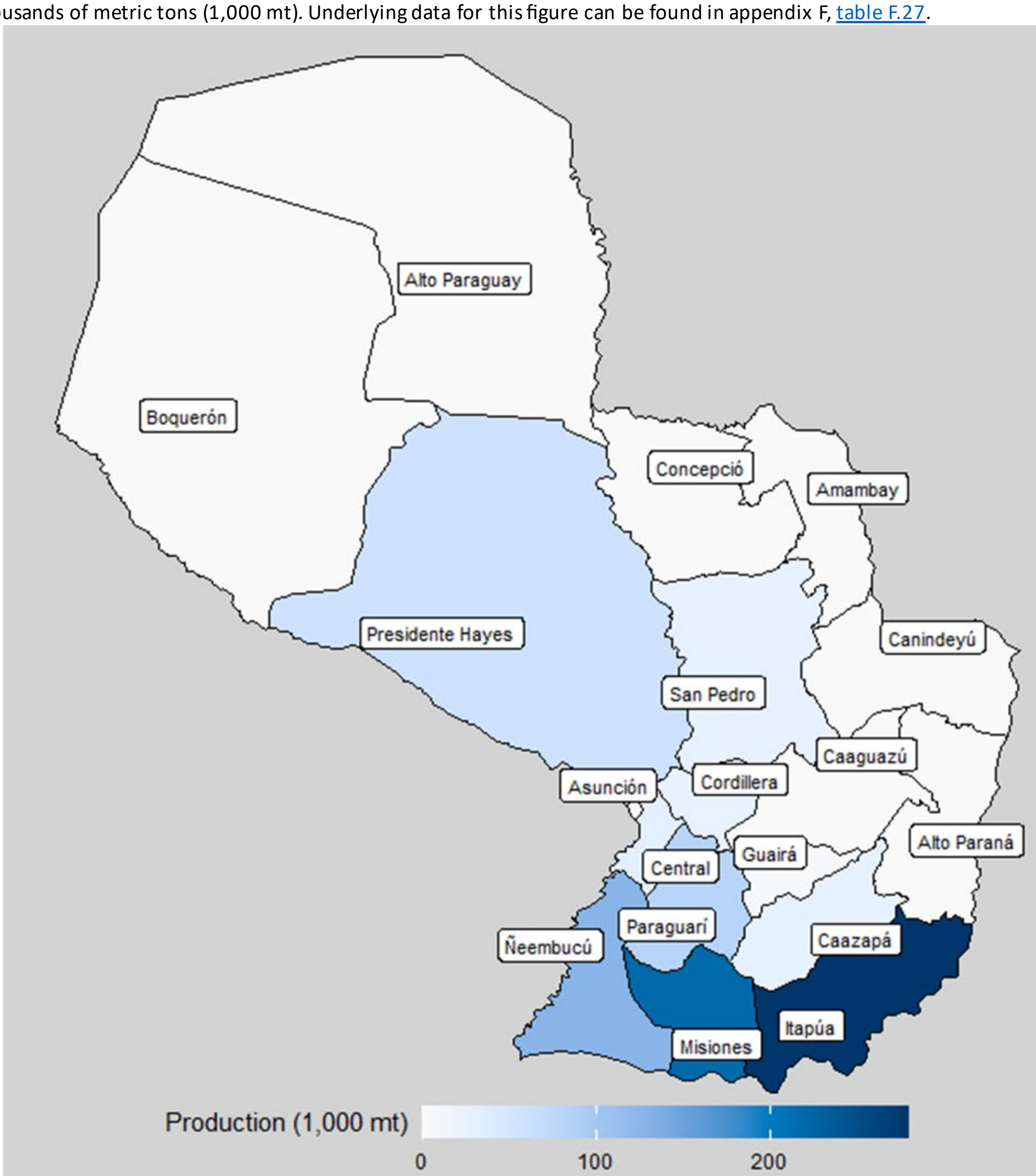
[1258] U.S. government official, interview by USITC staff, September 12, 2024.

[1259] Bajo Chaco is a lowland region near the Paraguay River in Presidente Hayes, Paraguay.

[1260] USDA, FAS, *Grain and Feed Annual: Paraguay*, April 9, 2021, 5.

Figure 7.4 Paraguayan rice-planted area, marketing year 2023/24

In thousands of metric tons (1,000 mt). Underlying data for this figure can be found in appendix F, table F.27.



Source: Government of Paraguay, MAG, written submission to the U.S. International Trade Commission in connection with *Rice: Global Competitiveness and Impacts on Trade and the U.S. Industry*, July 12, 2024, 8.

The number of rice farms in Paraguay is declining because small-scale farmers are exiting the market because of competition from large, mechanized producers. In addition, economic instability, a lack of technical assistance, and uncertainty over land tenure have affected small-scale farming.[1261] These factors have caused a sharp decline in the number of rice farms in Paraguay, despite a large increase in

[1261] Ultima Hora, "Mecanización Desplaza a Pequeños Arroceros [Mechanization Displaces Small Rice Farmers]," December 24, 2008; Fischer et al., "Analysis of the Productivity and Production Cost in Pilot Cultivation," June 3, 2024, 114.

planted area. The 2008 National Agricultural Census in Paraguay found that 1,942 rice farms covered 35,461 hectares of cultivated area, or an average of just over 18 hectares per farm. Approximately 37 percent of these farms were irrigated.[1262] By comparison, the 2022 census reported 220 farms covering 210,653 hectares of cultivated area, or an average of 958 hectares per farm. Approximately 89 percent of these farms were irrigated.[1263]

Paraguayan producers plant rice varieties from neighboring countries, with 11 of the 30 registered cultivars developed in Brazil. The most widely planted cultivars in Paraguay were developed in Brazil.[1264] Like those planted in Uruguay and Brazil, virtually all cultivars planted in Paraguay are non-hybrid and regarded as high quality.[1265] Planting normally takes place from late July through October, with the harvest starting in late December and continuing through April each year. Unlike in Uruguay, continuous rice cropping systems are most common in Paraguay.[1266]

In Paraguay, growers are mostly vertically integrated, so most milling occurs on-farm. By contrast, in Uruguay and Brazil, paddy rice is typically sold to independent mill owners through contracts.[1267] Paraguay's integrated operations tend to be the more cost-efficient operations compared to smaller producers, who generally lack technology.[1268] About one-third of the total harvested area in Paraguay is milled and processed by about a dozen large rice mills.[1269] The Paraguayan Chamber of Rice Industries (CAPARROZ), representing 13 millers, accounts for the majority of rice milling in the industry. Most CAPARROZ members are involved in multiple stages of rice production, including growing, drying, milling and processing, and exporting.[1270]

Paraguay's industry expansion is constrained by infrastructure bottlenecks. Although Paraguay's waterways offer a natural transportation network to connect Paraguay to neighboring countries, Paraguay's port and freight rail infrastructure does not allow Paraguay to take full advantage of these resources.[1271] As a result, Paraguay mainly relies on trucks to transport rice.[1272] Similarly, although Paraguay's river system allows for low-cost, renewable energy through hydropower, smaller farmers and

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[1262] Government of Paraguay, MAG, Written submission to the U.S. International Trade Commission in connection with *Rice: Global Competitiveness and Impacts on Trade and the U.S. Industry*, July 12, 2024, 8.
[1263] Government of Paraguay, MAG, Written submission to the U.S. International Trade Commission in connection with *Rice: Global Competitiveness and Impacts on Trade and the U.S. Industry*, July 12, 2024, 8.
[1264] The most widely planted cultivars are IRGA 424 and IRGA 417. Fischer et al., "Analysis of the Productivity and Production Cost in Pilot Cultivation of the New Rice Variety CEA-5K-PUNTA," June 3, 2024, 114.
[1265] According to industry representatives, nonhybrid rice often has homogeneous grain lengths, while hybrid rice's grain lengths have more variation. This leads to uneven cooking and more broken grains when milling. Industry representative, interview by USITC staff, March 25, 2024; U.S. government official, interview by USITC staff, September 12, 2024.
[1266] Macedo et al., "Irrigated Rice Rotations Affect Yield and Soil Organic Carbon Sequestration in Temperate South America," 2022.
[1267] Foreign government official, interview by USITC staff, October 2, 2024.
[1268] USDA, FAS, *Grain and Feed Annual: Paraguay*, April 17, 2020, 5; U.S. government official, interview by USITC staff, September 12, 2024.
[1269] USDA, FAS, *Grain and Feed Annual: Paraguay*, March 27, 2019, 4; U.S. government official, interview by USITC staff, September 12, 2024.
[1270] Agencia Argentina de Inversiones y Comercio Internacional, "Investigación de Mercado [Market Research]," February 2021, 11.
[1271] U.S. government official, interview by USITC staff, September 12, 2024.
[1272] Foreign government official, interview by USITC staff, October 2, 2024.

millers reportedly struggle to access Paraguay's electricity grid because of the limited last mile connection infrastructure.[1273] However, active government investments in Paraguay's transportation and logistics infrastructure may improve Paraguay's infrastructure conditions in the future.[1274]

Government Programs

The government of Paraguay does not directly intervene in the rice industry. However, Paraguay undertakes certain activities to promote the agricultural sector. According to the WTO's Agriculture Information Management System, domestic support under Article 6.2 of the Agreement on Agriculture ("Development Programs") averaged $9.4 million per year between 2018 and 2022.[1275] Other subsidies averaged $97.2 million between 2018 and 2023.[1276] In 2022, just over half of this support was related to pest and disease control, followed by $11.7 million in agricultural and advisory services.[1277]

Paraguay offers a variety of tax benefits and policies to promote economic activity in the agricultural sector, including a lowered value-added tax for "basic products" at 5 percent versus 10 percent for other goods.[1278] However, according to the U.S. Department of State, certain governance and regulatory issues continue to impede investment.[1279] Additionally, Paraguay's land ownership regime, while promoting growth, international investment, and consolidation among large producers, has received criticism for reducing the number of small farms.[1280]

Factors of Competitiveness

Paraguay has only recently become a major global rice-exporting country. This rapid export success is due primarily to Paraguay's low land cost, which has encouraged rice producers to expand planted area and invest more in mechanized production practices. Cost competitiveness has especially fueled the rapid growth of Paraguayan rice exports to Brazil. Although Brazil offers Paraguay a reliable export market, Paraguay's rice industry is dependent on Brazil for both cultivar development and sales. This exposes Paraguay's rice industry to risks from fluctuations in the Brazilian market and inhibits the Paraguayan industry from developing different varieties of rice for different market segments.

[1273] U.S. government official, interview by USITC staff, September 12, 2024; "Itaipu Hydroelectric Dam," November 30, 2020.
[1274] Amigo Camionero, "Producción de arroz crece en el Chaco y Paraguay apunta a ser líder mundia [Rice production grows in the Chaco and Paraguay aims to be a world leader]," January 26, 2024; U.S. government official, interview by USITC staff, September 12, 2024.
[1275] WTO, Committee on Agriculture, "Paraguay: Domestic Support Notification, 2024," June 20, 2024.
[1276] Paraguay reports these other subsidies to the WTO as exempt from reduction commitments ("Green Box").
[1277] WTO, Committee on Agriculture, "Paraguay: Domestic Support Notification, 2024," June 20, 2024.
[1278] Basic products include rice, pasta, edible oils, maté, milk, eggs, flour, and iodized salt. WTO Secretariat, *Paraguay*, November 29, 2017, 49; WTO Secretariat, *Trade Policy Review: Paraguay*, September 25, 2024, 42.
[1279] These include judicial insecurity and corruption. U.S. Department of State, "2023 Investment Climate Statement: Paraguay," accessed August 28, 2024.
[1280] World Bank Group, "Transforming the Agricultural Practices, Resource Access, and Land Title Stability," accessed December 2, 2024; Oxfam America, "Land and Human Rights in Paraguay," November 2014; Arce, Caballero, and Arias, *Paraguay Agricultural Sector Risk Assessment*, June 2015, I–21; Andrés Gaudín, "Agribusiness Strangles Paraguay's Shrinking Rural Population," October 6, 2017.

Low-Cost, High-Quality Production

According to some sources, Paraguay has the lowest production costs within South America.[1281] Several factors contribute to its low cost. Low land prices in Paraguay, particularly compared to Brazil, has attracted domestic and foreign investment in Paraguay's agricultural sector, including by agribusinesses from other MERCOSUR member states. This investment has fueled the rice industry's growth both new entrants and incumbents expanding planted area.[1282] In addition to land, private investments have been made in machinery and equipment used to improve soil preparation and crop management.[1283] Because farm size is increasing, overall rice production benefits from economies of scale, where the capital costs are spread over a larger amount of production.

Owing to investment and industry structure, Paraguay has a reputation, particularly in Brazil, for delivering the high-quality rice favored by consumers. This high quality can be attributed, at least in part, to mechanized production practices that reduce spoilage and the share of broken kernels in milling.[1284] In addition, large, international operators in Paraguay mill rice on-farm, which not only further reduces spoilage, but also reduces commingling, an important characteristic of high product quality.[1285] Paraguay also benefits from high-yield, high-quality non-hybrid rice varieties developed in neighboring countries.[1286] These varieties are largely substitutable with high-quality rice produced across South America.[1287]

Reliable, Low-Cost Supplier to the Brazilian Market

Paraguay's rice industry developed largely to supply the Brazilian market. More than 90 percent of Paraguay's rice production is exported. Three-quarters of that is consumed in Brazil, a share that has risen over time.[1288] Reportedly, some Brazilian producers choose to sell their rice to overseas markets rather than domestically because of higher foreign prices and returns overseas. This allows Uruguayan and Paraguayan producers to satisfy Brazil's domestic demand at a lower delivered cost than what Brazilian producers can offer.[1289]

Beyond low production costs, Paraguay has other advantages in supplying the Brazilian market. For example, as a MERCOSUR member, Paraguay has tariff-free access to Brazil; it is exempt from the 9 to 10.8 percent tariff countries outside MERCOSUR face. Also, Paraguay's geographic proximity to some of

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[1281] Total production costs were estimated at $1,400 per hectare, providing a net income of $600–$800 per hectare. USDA, FAS, *Grain and Feed Annual: Paraguay*, April 10, 2024, 6.
[1282] Planeta Arroz, "Paraguai será em breve uma potência mundial em arroz [Paraguay Will Soon Be a World Powerhouse in Rice]," January 29, 2024; U.S. government official, interview by USITC staff, September 12, 2024.
[1283] Planeta Arroz, "Feparroz destaca expansão da rizicultura no Paraguai [Feparroz Highlights Expansion of Rice Farming in Paraguay]," September 28, 2024.
[1284] Fukai et al., "Research Strategies for Mechanised Production of Rice in Transition from Subsistence to Commercial Agriculture," January 2, 2019.
[1285] U.S. government official, interview by USITC staff, September 12, 2024; foreign government official, interview by USITC staff, October 2, 2024.
[1286] Fischer et al., "Analysis of the Productivity and Production Cost in Pilot Cultivation," June 3, 2024.
[1287] U.S. government official, interview by USITC staff, August 30, 2024.
[1288] Government of Paraguay, MAG, written submission to the U.S. International Trade Commission in connection with *Rice: Global Competitiveness and Impacts on Trade and the U.S. Industry*, July 12, 2024, 13.
[1289] U.S. government official, interview by USITC staff, September 12, 2024.

Brazil's population centers gives it a transportation cost advantage compared to Brazilian producers because of shorter distances from mill to market. Further disadvantaging Brazilian producers, rice is typically transported by truck throughout Brazil and Brazilian producers often must pay internal value-added taxes when moving product north, from Rio Grande do Sul.[1290]

Brazil affords a large market for Paraguay's rice sector, but the high degree of reliance presents certain drawbacks. The lack of export market diversification means that Paraguay is highly exposed to changes in the Brazilian rice sector, trade policies, and macroeconomy.[1291] For example, a devaluation of the Brazilian currency potentially could lead to Paraguayan rice becoming comparatively more expensive relative to rice from Brazilian production and cause a reduction in exports.[1292] Paraguay's president expressed aspirations to develop Paraguay into a "world powerhouse for rice," including expanding into other export markets.[1293] However, recent trade trends indicate that the Paraguayan rice industry is becoming more reliant on the Brazilian market, rather than less. In addition, because Paraguay lacks a seed certification program, it uses seeds imported from Brazil for planting.[1294] Without a certification program, Paraguay is unable to develop its own cultivars adapted and tailored to the demands of certain export markets.[1295] According to government officials, although the two most widely planted rice cultivars are from Brazil and both well received in the Brazilian markets, Paraguay does not have access to Brazil's best and highest-value cultivars.[1296] However, Paraguayan government and industry seek to develop a seed certification program.[1297] If successful, Paraguay's rice industry could develop higher-value cultivars and establish a national "brand" for Paraguayan rice to compete in both the Brazilian market and other export markets.

[1290] Most rice from Paraguay is imported into Paraná, which borders Paraguay and the State of São Paulo, Brazil. São Paulo is a major population center. Rice produced in Rio Grande do Sul, Brazil, must travel through the States of Santa Catarina and Paraná before entering the State of São Paulo. U.S. government official, interview by USITC staff, September 12, 2024; U.S. government official, interview by USITC staff, August 8, 2024; USDA, FAS, *Grain and Feed Annual: Paraguay*, April 10, 2024, 7; Azevedo, "Paraná é a principal porta de entrada do arroz importado pelo Brasil [Paraná is the main entry point for rice imported into Brazil]," July 21, 2024.
[1291] Arce, Caballero, and Arias, *Paraguay Agricultural Sector Risk Assessment*, June 2015, I–12.
[1292] USDA, FAS, *Grain and Feed Annual: Paraguay*, March 27, 2019, 4.
[1293] Planeta Arroz, "Paraguai será em breve uma potência mundial em arroz [Paraguay Will Soon Be a World Powerhouse in Rice]," January 29, 2024; foreign government official, interview by USITC staff, October 2, 2024.
[1294] Foreign government official, interview by USITC staff, October 2, 2024; Planeta Arroz, "Paraguai busca variedades próprias de arroz [Paraguay seeks its own rice varieties]," November 23, 2023.
[1295] ABC Color, "Paraguay necesita contar con variedades propias de arroz [Paraguay needs to have its own rice varieties]," November 1, 2023.
[1296] Foreign government official, interview by USITC staff, October 2, 2024.
[1297] Foreign government official, interview by USITC staff, October 2, 2024.

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Chapter 8
Effects of Rice Policies and Programs

Countries use a variety of policy instruments to achieve a range of objectives related to their rice consumption, production, or trade, as previous chapters discuss. These country-specific policies can have significant effects on global rice markets beyond the countries that apply them. This chapter presents results from a global partial equilibrium model used to simulate how various government policies affect global production, consumption, trade, and prices of rice, using market data and policies in 18 country groups, including the United States and major rice-producing countries in Asia and South America. Because government policies related to the rice industry are too numerous and diverse to be examined in their entirety, this chapter focuses on a set of policies that U.S. rice industry representatives have identified as particularly relevant or concerning in markets for U.S. rice.

Simulations model hypothetical counterfactual changes in these identified policies to provide an estimation of how the policies would affect international rice markets were the changes to be introduced. To simulate the effects of these hypothetical policy changes, the U.S. International Trade Commission (Commission) first ran a model with existing policies in place as of 2023, establishing base levels of production, revenue, consumption, trade, and prices. The Commission then altered government policy model inputs, which the model used to produce new, counterfactual levels of production, revenue, consumption, trade, and prices. The difference between the base levels and counterfactual levels provides an estimate of the effects of each hypothetical government policy change.

Overview of Key Findings

The Commission considered counterfactual changes to the following policies: tariffs, export bans, tariff-rate quotas (TRQs), export taxes, minimum support prices (MSPs), and government-to-government contracts. Together, counterfactual results indicate that rice policies introduced by an individual country can have a significant impact on global rice prices and trade, as well as on consumers and rice growers in the United States. Rice policies can affect consumption and caloric intake in developing countries, the magnitude of which depends on the policy and on the enacting country's role in global rice trade.

An increase in Japan's rice TRQ and an imposition of export charges on rice from Thailand would have modest effects on U.S. rice producers. Export charges on Thai rice, meanwhile, would have the largest effects on U.S. rice consumers. A multilateral removal of all tariffs on rice would have a large effect on U.S. rice producers and on the global rice market. The model shows tariff liberalization would also have a positive effect on food security as measured by the average calorie gap in certain net importing countries, with all other policy simulations having little or no impact on food security. However, the multilateral removal of tariffs is a policy change of much greater scope than the other counterfactuals discussed in this chapter, and as such, the magnitude of its effect is not directly comparable with other simulations.

Economic Effects of Rice Policies

A variety of government programs affect global rice markets. A rice policy implemented by an individual country can affect trade, consumption, production, and prices of rice throughout the world. For example, a policy disincentivizing exports from one country could decrease rice consumption in all countries that import from that country while raising domestic production in importing countries as their consumers substitute domestically produced rice for the lower volume of imports. A policy intending to stimulate domestic production could make domestically produced rice cheaper and cause consumers to use less foreign-produced rice, lowering exports from other countries and production of rice in those countries. Given the segmented nature of the rice market, the effects of government programs that affect rice production or trade may be more acute in certain regions or markets.

Governments can use tariffs and TRQs to protect their domestic rice industries from import competition. If a government were to lower its tariff rate or, alternatively, to raise the volume of in-quota imports permitted under its TRQ, imports would become less expensive, resulting in higher levels of imports in the market of the initiating country. The availability of cheaper imported rice could cause domestic consumption to rise, domestic production to fall, and more production in trading partners' rice industries to meet the higher demand for imports. Conversely, if a government raised its tariff rate, production in trading partners' rice industries could decrease.

However, if multiple countries lowered their tariffs simultaneously, exports and domestic production in each country could increase or decrease, depending on the relative size of the tariffs and each country's status as a major importer or exporter of rice. For example, if all countries eliminated tariffs on rice, production in a major rice-exporting country with low initial import tariffs would benefit from greater access to foreign markets more than it would lose from increased competition in the domestic market. Because that country's tariff was low from the outset, its rice industry was never strongly insulated by tariffs from foreign competition. Production in a rice-exporting country with higher import tariffs might instead fall because increased competition in the domestic market outweighs a higher degree of access to foreign markets.

Export bans or export charges are trade barriers used by governments to address food security. By inducing rice producers to sell rice domestically rather than for export, more rice would be available domestically at lower prices for domestic consumers. Removing export bans or export charges could lead to higher domestic prices and lower domestic consumption because more rice would be exported without any increase in imports. Competition from the newly increased exports could cause consumption to rise and production to fall in other countries.

Governments use their public stockholdings of rice to insulate both consumers from rising prices and producers from falling prices. These policies stabilize domestic markets by design but can transfer instability onto international markets. For example, a release of public rice stocks into the domestic market would lower domestic prices, as intended, but could reduce imports and lower international rice prices as well, with potential negative impacts on foreign rice producers.[1298]

[1298] OECD, *The Economic Effects of Public Stockholding Policies*, October 18, 2018, 15.

Minimum support prices often complement the maintenance of public stocks when governments offer to buy rice from producers at a preannounced minimum support price.[1299] If the minimum support price is raised above market price, then domestic rice producers have an incentive to increase production. Because rice producers can sell some of their rice to the government at above-market rates, they can maintain profits while selling additional rice to consumers at lower prices. Lower prices in turn would generate higher rice consumption. Production and exports of rice from other countries could fall because of increased competition with domestic rice. A minimum support price below the market price would not affect markets at all.

Analytical Approach

The Commission developed a global partial equilibrium model to simulate the economic effects of specific policies and programs on international rice markets. The model captures important market features such as the general production and milling process, the substitutability of different varieties of rice, and government policy mechanisms relating to the consumption, production, and trade of rice. Consumers in the model would be able to substitute between aromatic rice and nonaromatic rice and between rice of different country origins. Simulations of the model were performed using data on 18 country groups in 2023.

The model contains 18 country groups: 16 individual countries, one aggregated group of developed countries, and one aggregated group of developing countries. Individual countries in the model are the United States, 12 countries in East Asia and Southeast Asia (including China, Indonesia, Thailand, and Vietnam) and South Asia (including Bangladesh, India, and Pakistan) (table 8.1), and major South American rice producers Brazil, Paraguay, and Uruguay.[1300]

[1299] OECD, *The Economic Effects of Public Stockholding Policies*, October 18, 2018, 24, 59.
[1300] For more detailed discussion of rice markets in India, see chapter 5. For discussion of rice markets in Indonesia, Japan, Thailand, and Vietnam, see chapter 6. For discussion of rice markets in South America, see chapter 7.

Table 8.1 Individual countries included in the rice model
M = net importer; X = net exporter

Country	Region	Global rice market status
Bangladesh	South Asia	M
Brazil	South America	X
Burma	Southeast Asia	X
Cambodia	Southeast Asia	M
China	East Asia	M
India	South Asia	X
Indonesia	Southeast Asia	M
Japan	East Asia	M
Pakistan	South Asia	X
Paraguay	South America	X
Philippines	Southeast Asia	M
South Korea	East Asia	M
Thailand	Southeast Asia	X
United States	North America	X
Uruguay	South America	X
Vietnam	Southeast Asia	X

Source: S&P Global, Total exports, HS heading 1006, rice, accessed August 30, 2024.

India, Thailand, and Vietnam export the largest quantities of rice. The United States is a net exporter of rice, with U.S. rice exports slightly more than three times as high as U.S. imports in 2023. China imported the largest quantities of rice in 2023, followed by the Philippines and Indonesia.[1301]

Production of milled rice and paddy rice in the model is a simplification of the actual rice production stages, as shown in figure 1.1 in chapter 1. Production of milled rice for purposes of the partial equilibrium model occurs in two stages: farming of paddy rice and processing, or milling, of this paddy rice. Production of paddy rice in the model is a function of fertilizer, pesticides, energy, water, seed, land, labor, and capital. These inputs are allowed to adjust freely, so simulated effects should be interpreted as long-run impacts rather than short-run impacts. For processing, the model assumes a fixed milling cost in dollars per metric ton of paddy rice—identical across all countries—which is the fixed value added to paddy rice being milled. Countries in the model would be able to trade rice in milled varieties or paddy varieties; if the latter, the importing country would process the paddy rice that it has imported.

The model includes both aromatic and nonaromatic rice. Consumers decide how much rice to consume of each variety from each country source. For example, the model allows for consumer substitution between Pakistani aromatic rice and Indian aromatic rice, or between U.S. nonaromatic rice and Brazilian nonaromatic rice.[1302] The model is constructed so that consumers are willing to substitute between different origins of the same variety of rice more readily than they substitute between varieties of rice.

The model is used to analyze seven types of policies relevant to the global rice trade: tariffs, export bans, TRQs, export taxes, MSPs, public stockholdings, and government-to-government contracts. The price that consumers pay for rice takes into account where the rice is produced and processed as well as import

[1301] S&P Global, Total exports, HS heading 1006, rice, accessed August 30, 2024.
[1302] Rice consumers select across multiple attributes when purchasing rice, so the model assumes that rice is not perfectly substitutable across different varieties or different origins. Bairagi et al., “Determinants of Consumer Preferences,” July 2017.

tariffs, export taxes, and consumption subsidies. The model does not include transportation or other costs in its simulations.

Data Sources

Data on bilateral trade flows of nonaromatic rice come from the Global Trade Atlas; data on production of nonaromatic rice come from the USDA's Production, Supply, and Distribution Online database. The model also incorporates data on producer prices from the Food and Agriculture Organization of the United Nations; for countries that did not have this information in recent years, producer prices were calculated by scaling up prices from the 2015 USITC rice report by the average price increase for countries that do have these data.[1303] Data for aromatic shares of rice production and trade for India, Thailand, and Vietnam come from country-specific sources.[1304] For Pakistan, data were assigned using aromatic shares of rice production and trade from the 2013 RiceFlow database because more recent country-specific information was not available.[1305] Data collection on the share of production costs for each input likewise comes from either RiceFlow or country-specific reports.[1306]

The model also employs policy data on TRQs for Japan[1307] and import tariffs applied by all other countries. Data on tariffs come from the World Integrated Trade Solution.[1308] Information on TRQs for Japan comes from USDA Global Agricultural Information Network reports.

1303 FAO, "Producer Prices," accessed various dates; USITC, *Rice: Global Competitiveness*, April 2015.
1304 S&P Global, GTAS database, Exports, HS Heading 1006, accessed August 30, 2024; Government of Thailand, Office of Agricultural Economics, *Agricultural Statistics of Thailand 2023*, March 2024; USDA, FAS, *Grain and Feed Annual: India 2024*, March 29, 2024; U.S. government official, interview by USITC staff, September 20, 2024.
1305 India, Pakistan, Thailand, and Vietnam are the only four countries that produce significant amounts of aromatic rice. For more information on aromatic and nonaromatic rice production data, see appendix E. Durand-Morat and Wailes, "RiceFlow: A Multi-Region, Multi-Product, Spatial Partial Equilibrium Model," July 2010.
1306 Kookkaew, "Cost and Return on Investment," January 2019, 91; Government of India, MAFW, "Cost of Cultivation/Production Estimates," April 6, 2024; ACA, "Costos productivos [Production costs]," December 2023, 30; BRRI, "Estimation of Costs and Returns," November 2023, 245; Government of Pakistan, "Rice Paddy Policy Analysis for 2022–23 Crop," accessed October 29, 2024, 13; Durand-Morat and Wailes, "RiceFlow: A Multi-Region, Multi-Product, Spatial Partial Equilibrium Model," July 2010; Fakkhong and Suwanmaneepong, "Determinants of Profitability of Rice Farming," 2016; 통계청 [Statistics Korea], "2023 년산 논벼(쌀) 생산비조사 결과 [Results of the 2023 Rice Paddy Production Cost Survey]," December 12, 2024; Government of Japan, MAFF, "農産物生産費統計 [Agricultural Production Cost Statistics]," December 12, 2024; Khoiriyah et al., "Analyzing The Cost of Paddy Rice Labor in Indonesia," August 19, 2023, 195–198.
1307 Although multiple other countries have rice TRQs, the model focuses on Japan because Japan is the most important export market for U.S. medium grain rice and computational difficulties inhibit the modeling of TRQs for every country that uses them.
1308 Each country's tariffs in the model are given by the most-favored-nation tariff that it applies to rice imports. If one country applies a preferential tariff rate to imports from another country as part of a free trade agreement, that preferential rate is used instead. For more details on the construction of tariff rates, see appendix E.

Caveats and Limitations

Before presenting simulation results, this chapter discusses some ways in which the model cannot perfectly represent the reality of international rice markets. Discussions for each simulation also present any additional caveats and limitations relevant to that particular simulation.

One limitation of the model simulations relates to aggregation across countries and rice varieties. To limit computational intensity, the model includes only 16 countries directly and aggregates the remaining countries into high-income and developing groups. This aggregation limits the model's ability to look at granular impacts of rice policies on many developing countries, particularly developing countries in Africa and the Middle East. In addition to country-level aggregation, the model incorporates only two rice varieties—nonaromatic and aromatic—and does not distinguish between long grain, medium grain, and short grain nonaromatic varieties. However, the demand parameters in the model capture many of the differences in country-specific rice characteristics because they are calibrated to the production and consumption characteristics of each country or country group. The model differentiates milled rice from unmilled (paddy) rice, of which the United States is a major exporter.[1309]

Data on input costs, production of aromatic rice, and bilateral trade in aromatic rice were not available for every country in 2023. To overcome these data limitations, the model incorporates information on aromatic shares of production and aromatic share of bilateral trade flows from the 2013 RiceFlow model. The model also uses data on producer prices from the USITC 2015 Rice report for countries where more recent producer price data were absent. Such information reflects international rice markets from about 10 years ago rather than the present but would not unduly skew results unless countries substantially adjusted their aromatic production or trade profiles during this time.

Furthermore, the model does not consider potential future government interventions, such as production or consumption subsidies, that might arise in response to changes in prices, production, revenue, and profit. Nor does the model, in its analysis of food security, account for differences in food security across various segments of a country's population. The model also treats public stockholding (PSH) as an endogenous outcome of MSP and export control policies. This approach fits well with India's PSH policies[1310] but may not be representative of countries that set their PSH levels exogenously rather than adjust PSH levels in response to previous events.

The design of the model addresses elements of the request letter, which notes two specific government policies: PSH programs and export restrictions.[1311] Unlike the 2015 USITC report, whose simulations involved removing tariffs, producer subsidies, or consumer subsidies from all countries simultaneously,[1312] this report did not examine major categories of government policies for rice across countries. With the exception of simulation 6, which establishes some continuity with the 2015 report, the model instead presents illustrative examples of particular policies used by specific countries and a range of probable effects for these policies in order to respond to the current request letter. Although the 2015 modeling approach is more suitable for comparing the economic effects that different rice

[1309] S&P Global, Total exports, HS heading 1006, rice, accessed August 30, 2024.
[1310] OECD, *The Economic Effects of Public Stockholding Policies*, October 18, 2018, 24.
[1311] See appendix A for the request letter from the House Ways and Means Committee.
[1312] USITC, *Rice: Global Competitiveness*, 2015, 354.

policies could have, the approach used in this chapter more accurately estimates the economic effects of specific rice policies that individual countries could use.

Model Simulation Results

This section contains the model results for six simulations conducted with the aforementioned partial equilibrium model of global rice trade in order to illustrate the effects of various types of policies applied by countries of interest listed in the request for this investigation. Simulations 1, 2, and 6 estimate the impact of removing or relaxing a policy or program; simulations 3–5 expand existing policies or model a policy that was not active in the base year (table 8.2). Simulations 1–5 consider unilateral policy changes that take place in one or two countries only; simulation 6 considers a multilateral policy counterfactual scenario that takes effect among all countries featured in the model except Japan.

Table 8.2 Overview of modeling simulations

mt = metric tons; TRQ = tariff-rate quota; MSP = minimum support price; PSH = public stockholding; — = not applicable as simulation 6 does not include multiple cases.

Simulation	Policy change	Initiating country	Lowest impact (case a)	Middle impact (case b)	Highest impact (case c)
Simulation 1	Removal of export ban, PSH	India	10% increase in exports	30% increase in exports	50% increase in exports
Simulation 2	Relaxing of TRQ	Japan	Increase TRQ by 10%	Increase TRQ by 30%	Increase TRQ by 50%
Simulation 3	Imposing export charges	Thailand	2.5% charge	5% charge	10% charge
Simulation 4	Imposing an MSP	Brazil	MSP 2.5% above market price	MSP 5% above market price	MSP 10% above market price
Simulation 5	Government-to-government contract	India, Philippines	50,000 mt transferred	150,000 mt transferred	295,000 mt transferred
Simulation 6	Removal of all tariffs	All but Japan	—	—	—

Source: USITC.

For each simulation, results are shown for the United States on changes in consumer price, consumption, producer prices, production, revenue, profits, exports, and imports.[1313] This chapter then discusses effects of the counterfactual simulation on the initiating country—for example, if India relaxed its export ban, it would be the initiating country—as well as a sample of other countries that are either highly relevant to the given simulation or whose outcomes are strongly affected by the given simulation. Results on changes in production are shown for all countries, and changes in other variables are shown selectively based on each variable's relevance for the given simulation and the given country. Discussion of how counterfactual policy changes impact countries outside the United States helps provide a more complete insight into the economic effects that these policies can have, as well as context for discussion at the end of this chapter on how simulations 1–6 affect food security.

[1313] Because of the specific functional forms used to represent consumption and production, percentage changes in revenue calculated using this model are always equal to percentage changes in profit.

Results are presented both as changes in quantity and percentage changes from the given baseline value. Production quantities are given in terms of paddy rice; consumption, export, and import quantities are in milled rice equivalents.

As shown in table 8.2 above, simulations in this chapter model the effects of changes to India's export ban, a TRQ on imports of rice into Japan, export charges on rice from Thailand, a market support price for rice produced in Brazil, and a government-to-government contract between India and the Philippines. This chapter also discusses the estimated effects of removing tariffs on rice in all countries featured in the model, including the developed- and developing-country aggregates.

With the exception of simulation 6 (removal of all tariffs), simulations model a range of counterfactual scenarios arranged in order of lowest impact to highest impact, denoted by case a, case b, and case c in table 8.2. For example, simulations 2a, 2b, and 2c model increases in Japan's rice TRQ of 10 percent, 30 percent, and 50 percent, respectively. Simulations 1a, 1b, and 1c compute results under different assumptions about how a removal of India's export ban would affect exports of rice from India. The ranges in simulations 1–5 were modeled to reflect possible real-world scenarios, given present policies or policy changes that have occurred in the past.

With the exception of simulation 3, counterfactual policy changes apply only to nonaromatic rice. For example, simulation 6 removes all tariffs on nonaromatic rice, but not tariffs on aromatic rice. Simulation 3, however, introduces export charges on nonaromatic and aromatic rice from Thailand. Because the United States largely produces nonaromatic rice but consumes both aromatic and nonaromatic rice,[1314] this chapter provides results on changes in the average consumer price among both varieties and changes in total consumption of both varieties. Changes in production, revenue, profits, and exports reflect nonaromatic rice only. Results from other countries follow the same guidelines, unless otherwise specified.

Simulation 1: Removal of India's Export Ban

This simulation models a removal of India's export ban on nonaromatic rice, which was in effect from July 2023 until September 2024.[1315] Because India is a prominent exporter of rice, the imposition and removal of export restrictions in India cause volatility in global rice markets. For example, India introduced an export ban on non-basmati rice in 2007 and 2008 to improve food security in India.[1316] These restrictions caused global rice prices to increase,[1317] which likely exacerbated food insecurity in countries that relied on rice imports. Representatives of the U.S. rice industry have indicated concern

[1314] USDA, FAS, "Grains," accessed various dates.
[1315] Jadhav, Bhardwaj, and Dugar, "India Scraps Parboiled Rice Export Tax," October 23, 2024. For more information on India's export ban, see chapter 5.
[1316] Sharma, *Food Export Restrictions: Review of the 2007-2010 Experience and Considerations for Disciplining Restrictive Measures*, May 2011; Jensen and Anderson, "Grain Price Spikes and Beggar-Thy-Neighbor Policy Responses," August 12, 2015.
[1317] Sharma, *Food Export Restrictions: Review of the 2007-2010 Experience and Considerations for Disciplining Restrictive Measures*, May 2011; Headey, "Rethinking the Global Food Crisis," April 2011; Jensen and Anderson, "Grain Price Spikes and Beggar-Thy-Neighbor Policy Responses," August 12, 2015.

with India's export ban policies given previous experiences with these restrictions and the volatility they can create in global rice markets.[1318]

The model estimates the effect of a removal of India's export ban by initially calibrating parameters with observed India nonaromatic exports from 2023, which primarily occurred between January and June before the implementation of the ban; next, the model simulates the effect of increasing exports by a percentage of this quantity.[1319] This simulation assumes that a removal of India's export ban would not affect rice consumption in India, because India's government would release public stocks of rice to keep consumption at the level that existed while the export ban was still in place. Because the removal of India's export ban would have an unknown effect on its exports of nonaromatic rice, this modeling simulation uses a couple of reference points. A 30 percent increase in nonaromatic exports from India would make total Indian rice exports about equal to their level in 2022.[1320] Simulations 1a and 1b therefore assume that the removal of India's export ban would lead exports to increase by 10 percent and 30 percent, respectively, from their 2023 levels, while simulation 1c models a somewhat larger increase of 50 percent. In the model simulation, India would not impose export charges on nonaromatic rice after removing its export ban.

The Indian government has historically used export restrictions in tandem with public stockholding to prevent volatility in domestic prices and increase the availability of rice for consumers in India. The country reversed its most recent export ban in September 2024; India removed export taxes on rice but set a floor price for nonaromatic rice exports.[1321] Because the base year used in computing the model does not include September 2024, simulation 1 does not feature minimum floor export prices India imposed at the time. Instead, it models a range of counterfactual export increases.

Removing India's export ban would cause consumer prices in the United States to fall and U.S. consumption to rise, as U.S. imports of nonaromatic rice from India would increase 1.4–7.2 percent (table 8.3). Percentage changes in average consumer prices, producer prices, and total consumption would be smaller than 0.5 percent. U.S. production, revenue, profits, and exports all would decline because the newly increased nonaromatic exports from India would compete with U.S. production of nonaromatic rice in world markets; revenue and profits would fall by 1.1 percent if India's exports were to increase by 50 percent compared to 2023 levels.

While U.S. rice industry representatives have indicated that the removal of India's export ban could have large negative impacts on the U.S. rice industry, the results of simulation 1 do not reflect an effect on production, revenue, or profits for U.S. producers of much more than 1 percent. Because this is a long-run model (that is, inputs may be freely adjusted), the percentage change effects shown in table 8.2 and

[1318] USITC, hearing transcript, April 30, 2024, 16 (testimony of Kirk Satterfield, USA Rice); USITC, hearing transcript, April 30, 2024, 89 (testimony of Peter Bachmann, USA Rice).
[1319] This simulation is unable to use 2022 trade numbers as a benchmark in computing counterfactual exports. Because Indian export data are not separately available for aromatic rice and nonaromatic rice, doing so would require an assumption that aromatic shares of trade would not have differed between 2022 and 2023. This assumption is unrealistic given that India imposed an export ban halfway through 2023 that applied only to nonaromatic rice.
[1320] S&P Global, Total exports, HS heading 1006, rice, accessed August 30, 2024; USDA, FAS, "Grains," accessed various dates.
[1321] Jadhav, Bhardwaj, and Dugar, "India Scraps Parboiled Rice Export Tax," October 23, 2024.

table 8.3 do not capture any short-term volatility that a removal of India's export ban may introduce into global rice markets.

Table 8.3 Estimated percentage change effects of removing India's export ban, United States, 2023
mt = metric tons; ** = change is less than 0.05% in magnitude.

Variable	Baseline value (0%)	Simulation 1a (10% increase)	Simulation 1b (30% increase)	Simulation 1c (50% increase)
Average consumer prices	$588.9/mt	**	−0.1	−0.2
Producer prices	$427.7/mt	**	−0.1	−0.1
Total consumption	6,928,351 mt	0.1	0.2	0.3
Nonaromatic production	9,939,077 mt	−0.2	−0.6	−1.0
Nonaromatic exports	1,366,976 mt	−0.8	−2.3	−3.7
Nonaromatic imports	599,279 mt	1.4	4.3	7.2
Producer revenue	$4,250,843,759	−0.2	−0.7	−1.1
Producer profit	$586,616,439	−0.2	−0.7	−1.1

Source: USITC estimates, accessed December 9, 2024.

In India, prices would rise and public stockholding would fall if rice producers were to export some of their production, an option not available to them when the export ban was in place. Because the government of India releases public stocks of rice to keep Indian consumption at a constant level in the model, public stocks of rice would fall 0.6–3.0 percent. Governments' use of public rice stocks to maintain food security helps constrain domestic price increases, keeping increases in the average consumer price of rice in India below 1 percent. However, this release of public stocks could also compound the effects of removing the export ban, as the release of additional rice onto world markets could further crowd out production of rice in other countries, such as the United States.

Table 8.4 Estimated percentage change effects of removing India's export ban, by country, 2023
mt = metric tons; ** = change is less than 0.05% in magnitude.

Country	Variable	Baseline	Simulation 1a (10%)	Simulation 1b (30%)	Simulation 1c (50%)
India	Nonaromatic production	181,367,689 mt	0.5	1.4	2.4
India	Average consumer price	$336.7 mt	0.1	0.4	0.7
India	Total public stockholding	31,450,000 mt	−0.6	−1.8	−3.0
Bangladesh	Nonaromatic production	55,529,109 mt	−0.1	−0.2	−0.4
Bangladesh	Average consumer price	$357.1/mt	**	−0.1	−0.1
Bangladesh	Total consumption	37,381,916 mt	**	**	−0.1
Pakistan	Nonaromatic production	8,775,648 mt	−0.1	−0.4	−0.7
Pakistan	Nonaromatic exports	1,951,569 mt	−0.6	−1.7	−2.8
Developing-country group	Nonaromatic production	76,785,934 mt	−0.8	−2.2	−3.7
Developing-country group	Average consumer prices	$428.1/mt	−0.3	−0.9	−1.5
Developing-country group	Total consumption	68,153,766 mt	0.2	0.6	1.0

Source: USITC estimates, accessed December 9, 2024.

The developing-country group, which includes West African countries for whom India is an important supplier of rice,[1322] would experience lower prices, lower production, and higher consumption in this

[1322] S&P Global, Total exports, HS heading 1006, rice, accessed August 30, 2024.

simulation. Most increases in India's rice exports would go to this group, rather than to other rice-importing countries such as Bangladesh, Indonesia, or the Philippines. This percentage decrease in prices would be higher than the percentage decrease in prices for the United States in all three cases considered. Production and exports of Pakistani rice, which competes with Indian rice in African and Asian markets, would decrease.[1323]

Simulation 2: Expansion of Japan's Rice TRQ

In addition to tariffs, governments may restrict imports by setting TRQs. Japan's TRQ policy allows for an annual quota of 682,000 metric tons (mt) in milled rice.[1324] Imports of rice within the quota enter duty free; imports in excess of the quota face a prohibitively high out-of-quota rate of 341 yen per kilogram, equivalent to an ad valorem tariff of 793 percent.[1325] Because Japan is a major importer of U.S. rice,[1326] changes in its rice TRQ have a direct effect on U.S. exports. Access to the Japanese market is especially critical to the rice industry in California.[1327]

Japan's TRQ applies to imports from all countries and is filled every Japanese fiscal year.[1328] The TRQ does not set quantity limits for individual countries, however, so the model sets TRQs for exports of nonaromatic rice from each country to Japan equal to that country's quantity of nonaromatic rice exports to Japan in 2023. Simulation 2 then models increases in this amount. Recent changes in Japanese TRQ policy have been limited, with the most recent major change being an increase of about 80 percent in Japanese fiscal year 1997.[1329] The simulation therefore considers a wide spectrum of increases of 10 percent, 30 percent, and 50 percent in the amounts of rice each country exports to Japan at a tariff rate of zero.

With a higher within quota limit for Japan's rice TRQ, U.S. rice producers would be able to send more rice to the Japanese market at a zero tariff rate. Depending on the extent to which the TRQ is relaxed, U.S. production would rise by up to 1.2 percent, or about 120,000 mt, and its exports would rise by up to 7.1 percent, or almost 100,000 mt (table 8.5). U.S. consumer rice prices would rise—and U.S.

[1323] Although Pakistan shares a border with India, consumers in Pakistan consume wheat as a staple grain rather than rice, and Pakistan's rice industry is thus more export oriented. Removal of India's export ban therefore would result in increased competition between Pakistan and India in international rice markets rather than having any strong effects on consumers in Pakistan.
[1324] The quota includes both aromatic and nonaromatic rice; Japan, however, consumes very little aromatic rice, so the model assumes that Japanese rice quotas would apply exclusively to nonaromatic rice. For more information about Japan's TRQ, see chapter 9. S&P Global, Total exports, HS heading 1006, rice, accessed August 30, 2024; USDA, FAS, *Grain and Feed Annual: Japan*, March 20, 2024, 14.
[1325] Fukuda, Dyck, and Stout, *Rice Sector Policies in Japan*, March 2003, 12.
[1326] Japan was the third-largest destination for U.S. rice exports by volume in 2023, accounting for 9.7 percent of all U.S. rice exports and 57.9 percent of U.S. medium grain rice exports. For more information about U.S. export markets, see chapter 9. "Exports, HS Heading 1006," accessed August 30, 2024.
[1327] Industry representative, interview by USITC staff, August 23, 2024.
[1328] Japan administers its TRQ according to the Japanese fiscal year, which runs from April to March and is therefore different from the calendar year. GTAS import data based on the calendar year show that the volume of Japanese rice imports is higher than Japan's TRQ, but in reality exports of rice to Japan do not overfill the quota. For more details about Japan's rice TRQ, see chapter 9. S&P Global, Total exports, HS Heading 1006, rice, accessed August 30, 2024; USDA, FAS, *Grain and Feed Annual: Japan*, March 20, 2024.
[1329] Takahashi and Honma, "Evaluation of the Japanese Rice Policy Reforms," 2009, 4–5.

consumption of rice would fall—as some U.S. rice producers would opt to export rice instead of selling it in the domestic market. Changes in consumer price and consumption under the counterfactual scenario would be smaller, both in percentage terms and in magnitude, than changes in production and exports.

Table 8.5 Estimated percentage change effects of increasing Japan tariff-rate quota, United States, 2023
mt = metric tons; ** = change is less than 0.05% in magnitude.

Variable	Baseline value (0%)	Simulation 2a (10% increase)	Simulation 2b (30% increase)	Simulation 2c (50% increase)
Average consumer prices	$588.9/mt	**	0.1	0.1
Producer prices	$427.7/mt	**	0.1	0.2
Total consumption	6,928,351 mt	**	0.1	0.1
Nonaromatic production	9,939,077 mt	0.2	0.7	1.2
Nonaromatic exports	1,366,976 mt	1.4	4.3	7.1
Nonaromatic imports	599,279 mt	0.1	0.2	0.3
Producer revenue	$4,250,843,759	0.3	0.8	1.4
Producer profit	$586,616,439	0.3	0.8	1.4

Source: USITC estimates, accessed December 9, 2024.

The Commission's model treats the United States as a single market, without distinguishing between different U.S. regions. Model results therefore obscure any heterogeneity in how changes in Japan's TRQ policy would affect different rice-growing areas of the United States. Effects of Japan's increased TRQ on production of rice in California would be likely higher than the U.S. aggregate changes shown in table 8.5.

An increase in the quota for U.S. rice exports to Japan would increase rice consumption in Japan between 0.6 percent and 3.2 percent, depending on the extent to which the quota would be relaxed (table 8.6). This increase would be equivalent to 50,691 mt in the first simulation, 153,183 mt in the second, and 256,940 mt in the third. Production, meanwhile, would decrease by up to 1.3 percent because an increased volume of imports would substitute for production of rice by Japanese producers.

Table 8.6 Estimated percentage change effects of increasing Japan tariff-rate quota, by country, 2023
mt = metric tons; ** = change is less than 0.05% in magnitude.

Country	Variable	Baseline value (0%)	Simulation 2a (10%)	Simulation 2b (30%)	Simulation 2c (50%)
Japan	Production of nonaromatic rice	9,989,001mt	−0.3	−0.8	−1.3
Japan	Average consumer price	$1949/mt	−0.1	−0.4	−0.6
Japan	Total consumption	7,922,710 mt	0.6	1.9	3.2
Thailand	Production of nonaromatic rice	19,682,018 mt	0.2	0.7	1.1
Thailand	Nonaromatic exports	5,200,990 mt	0.6	1.9	3.1
China	Production of nonaromatic rice	206,957,313 mt	0.0	**	**
China	Nonaromatic exports	868,725 mt	0.8	2.5	4.2

Source: USITC estimates, accessed December 9, 2024.

Relaxing Japan's TRQ would also cause production and exports to increase for China and Thailand, two other important exporters of rice to Japan.[1330] Exports from Thailand would increase by up to 3.1 percent and exports from China would increase by up to 4.2 percent in the third simulation. China would display higher percentage increases in exports and lower percentage increases in production than

[1330] S&P Global, Total exports, HS heading 1006, rice, accessed August 30, 2024.

Thailand because, compared to Thailand, it has a higher baseline for production and lower baseline for exports. China's baseline production was 207 million mt of rice in 2023 compared with about 20 million mt of rice for Thailand,[1331] but Thailand exported 5 million mt of nonaromatic rice compared with less than 1 million mt for China.[1332]

Simulation 3: Thai Export Charges

Export charges are fees levied on exports in order to incentivize producers to sell rice domestically rather than export it, thus increasing the availability of domestically produced rice. Because Thailand is a major rice exporter,[1333] its export charge policies are highly relevant to global rice markets. Although Thailand does not currently apply such charges, it has done so in the past, and thus export charges likely remain part of Thailand's available rice policies that could be imposed in the future.[1334]

The model represents export charges as an ad valorem wedge between the price producers would receive for their rice and the price that foreign consumers would pay for that rice. Baseline export charges would be zero for all countries. Because Thailand has a maximum statutory export charge of 10 percent,[1335] this simulation examines the impact of ad valorem charges on Thai exports of 2.5 percent, 5 percent, and 10 percent. Thailand's export charge applies to all varieties of rice,[1336] including aromatic rice of which Thailand is a major producer and exporter.[1337] Therefore, unlike the other simulations, this simulation applies to aromatic and nonaromatic rice, and table 8.7 presents changes in U.S. consumption separately for aromatic rice and nonaromatic rice.

The imposition of charges on Thai exports would cause U.S. rice prices to increase and U.S. consumption to fall. Total U.S. rice consumption would fall by 0.4 percent for an ad valorem export charge of 2.5 percent, 0.7 percent for a charge of 5 percent, and 1.3 percent for a charge of 10 percent (table 8.7).[1338] This decrease in total rice consumption would be due predominantly to a decrease in consumption of aromatic rice; for example, in simulation 3a, consumption of nonaromatic rice would increase by 0.1 percent but consumption of aromatic rice would decrease by 4.3 percent. Although U.S. consumers would be able to substitute domestically produced nonaromatic rice for the loss in nonaromatic rice imports, the United States would not produce significant quantities of aromatic rice,[1339] so a higher price on rice imports from a large exporter such as Thailand would lower consumption.

[1331] USDA, FAS, "Grains," accessed various dates.
[1332] S&P Global, Total exports, HS heading 1006, rice, accessed August 30, 2024.
[1333] S&P Global, Total exports, HS heading 1006, rice, accessed August 30, 2024.
[1334] WTO, *Trade Policy Review: Thailand*, January 18, 2021, 63.
[1335] WTO, *Trade Policy Review: Thailand*, January 18, 2021, 63.
[1336] WTO, *Trade Policy Review: Thailand*, January 18, 2021, 63.
[1337] USDA, FAS, "Grains," accessed various dates.
[1338] Thailand in the past has typically imposed export charges on bilateral trade flows with certain other countries rather than imposing a charge on all of its exports, so the effects presented below represent upper limits on export charge effects. Theparat, "Govt to Slash Rice Export Tax," April 28, 2021.
[1339] USDA, FAS, "Grains," accessed various dates.

Table 8.7 Estimated percentage change effects of Thailand's export charges, United States, 2023
mt = metric tons.

Variable	Baseline value (0%)	Simulation 3a (2.5% charge)	Simulation 3b (5% charge)	Simulation 3c (10% charge)
Average consumer prices	$588.9/mt	0.3	0.5	1.0
Producer prices	$427.7/mt	0.1	0.1	0.2
Total consumption	6,928,351 mt	−0.4	−0.7	−1.3
Nonaromatic consumption	6,189,958 mt	0.1	0.2	0.4
Aromatic consumption	738,394 mt	−4.3	−8.3	−15.0
Nonaromatic production	9,939,077 mt	0.4	0.8	1.6
Nonaromatic exports	1,366,976 mt	0.2	0.4	0.8
Nonaromatic imports	599,279 mt	−3.7	−7.0	−12.5
Producer revenue	$4,250,843,759	0.5	1.0	1.8
Producer profit	$586,616,439	0.5	1.0	1.8

Source: USITC estimates, accessed December 9, 2024.

Export charges in Thailand would also result in U.S. rice production, revenue, and profits increasing; for a Thai export charge of 10 percent, U.S. production would rise by 1.6 percent and U.S. revenue and profits would increase by 1.8 percent. U.S. rice producers would benefit from U.S. consumers' ability to substitute domestically produced nonaromatic rice for Thai nonaromatic rice. The U.S. rice industry would benefit further from increased exports to developing markets.

Charges on rice exports from Thailand would cause consumer prices in Thailand to fall and consumption to rise, as Thai rice producers would reorient their production toward the domestic market instead of selling it abroad (table 8.8). Prices would decline and consumption would increase by slightly less than 1 percent if export charges were to reach the maximum statutory rate of 10 percent. Thai rice production would decrease in all simulations, indicating that consumption in domestic markets would not increase enough to compensate for the decrease in exports. The decrease in aromatic rice production would be smaller than the decrease in nonaromatic rice production, both in absolute terms and as a percentage of its base value.

Table 8.8 Estimated percentage change effects of Thailand's export charges, by country, 2023
mt = metric tons; ** = change is less than 0.05% in magnitude.

Country	Variable	Baseline value (0%)	Simulation 3a (2.5%)	Simulation 3b (5%)	Simulation 3c (10%)
Thailand	Nonaromatic production	19,682,018 mt	−3.4	−6.4	−11.4
Thailand	Aromatic production	10,606,050 mt	−2.1	−4.0	−7.2
Thailand	Average consumer price	$352.0/mt	−0.2	−0.4	−0.8
Thailand	Total consumption	13,202,449 mt	0.3	0.5	0.9
Vietnam	Nonaromatic production	17,279,978 mt	0.0	**	**
Vietnam	Nonaromatic exports	6,857,782 mt	0.3	0.6	1.1
Vietnam	Aromatic exports	463,951 mt	1.5	3.0	5.7
Indonesia	Nonaromatic production	51,973,230 mt	0.0	0.0	0.0
Indonesia	Average consumer price	$640.7/mt	0.2	0.3	0.6
Indonesia	Total consumption	36,062,853 mt	−0.2	−0.4	−0.8
Developing country group	Nonaromatic production	76,785,934 mt	0.0	**	**
Developing country group	Average consumer price	$428.1/mt	0.1	0.2	0.4
Developing country group	Total consumption	68,153,766 mt	−0.1	−0.2	−0.3

Source: USITC estimates, accessed December 9, 2024.

Because Thailand is a major exporter of rice,[1340] the export charges also would decrease rice consumption and would increase rice prices in the markets to which Thailand exports. Prices would increase by up to 0.6 percent in Indonesia and 0.4 percent in the group of developing countries. Exports from Vietnam, a major rice exporter that borders Thailand, would increase by up to 1.1 percent for nonaromatic rice and 5.7 percent for aromatic rice.[1341] The percentage increase in aromatic rice exports from Vietnam would be higher than that of nonaromatic rice exports because, although every country featured in this model produces nonaromatic rice, Thailand and Vietnam are two of the few countries that produce aromatic rice.[1342] As a result, aromatic rice exports in Vietnam would disproportionately benefit from an imposition of export charges in Thailand. However, an increase in exports from Vietnam would not be enough to overcome a decrease in exports from Thailand and rice consumption in developing countries would fall.

Simulation 4: Minimum Support Price in Brazil

This simulation models a minimum support price (MSP) in Brazil that is higher than the market price. The MSP simulated in the model approximately represents the Equalizing Premium Paid to Rural Producers (PEPRO) program.[1343] When the MSP is higher than the prevailing market price, the PEPRO program compensates millers for buying rice at that higher price.[1344] The PEPRO program for rice was only available for paddy rice and has not been active since 2018, when it operated for two months. Furthermore, the primary purpose of this program is to move commodities between Brazilian states

[1340] S&P Global, Total exports, HS heading 1006, rice, accessed August 30, 2024.
[1341] The results of the simulation for aromatic rice versus aromatic rice are presented in appendix E.
[1342] USDA, FAS, PSD Online database, accessed November 4, 2024.
[1343] For more information about the PEPRO program in Brazil, see chapter 7.
[1344] The MSP in the model would go to farmers rather than millers, introducing a slight discrepancy between the model and the PEPRO program.

rather than internationally. Nonetheless, Brazil does not prohibit rice purchased under the program from being exported, and the USDA Foreign Agricultural Service reports that the majority of rice procured using the program in 2018 likely was exported.[1345] The rice industries in Brazil and the United States directly compete in Western Hemisphere export markets, and USA Rice voiced concerns in 2018 about the potential for Brazil's minimum price guarantee to support exports.[1346]

The model represents the MSP as a production subsidy equal to the percentage difference between the set MSP and the market price. The simulation considers increases of 2.5 percent, 5 percent, and 10 percent above the baseline market price. When the program was last active in 2018, the value of the MSP was roughly 5.7% over market price, close to the middle counterfactual estimate.[1347]

The introduction of a binding MSP in Brazil would induce higher production of Brazilian rice. Production and exports in the United States would fall by less than 0.5 percent, but the influx of imported rice from Brazil would cause consumption in the United States to rise by 12,681 mt, or 0.2 percent. Percentage changes would be small in magnitude; all price decreases would be less than 0.1 percent, and would result in a loss in profit of 0.2 percent that would correspond to slightly less than $1.4 million (table 8.9). U.S. exports would decrease by up to 5,377 mt if the MSP subsidy were 10 percent. Although MSP policies can undermine U.S. competitiveness in international rice markets, the policy modeled in this simulation and applied by Brazil in 2018 is small in scope and therefore would not have a large effect on the United States.

Table 8.9 Estimated percentage change effects of Brazil's minimum support price, United States, 2023

mt = metric tons; ** = change is less than 0.05% in magnitude.

Variable	Baseline value (0%)	Simulation 4a (2.5% subsidy)	Simulation 4b (5% subsidy)	Simulation 4c (10% subsidy)
Average consumer prices	$588.9/mt	**	**	–0.1
Producer prices	$427.7/mt	0.0	**	**
Total consumption	6,928,351 mt	**	0.1	0.2
Nonaromatic production	9,939,077 mt	**	–0.1	–0.2
Nonaromatic exports	1,366,976 mt	–0.1	–0.2	–0.4
Nonaromatic imports	599,279 mt	0.8	1.8	3.8
Producer revenue	$4,250,843,759	–0.1	–0.1	–0.2
Producer profit	$586,616,439	–0.1	–0.1	–0.2

Source: USITC estimates, accessed December 9, 2024.

The support paid to Brazilian producers by their government would enable them to produce more rice, which would result in cheaper rice for domestic consumers as a well as a greater volume of exports. For example, the introduction of an MSP that is 5 percent higher than the market price would result in an increase of 22.4 percent in Brazilian exports, equivalent to 179,269 mt (table 8.10). Domestic consumption of rice in Brazil would increase 2–8 percent, and domestic prices would decrease by up to 6.8 percent.

[1345] USDA, FAS, *Grain and Feed Annual: Brazil*, April 4, 2021, 25.
[1346] USA Rice, "Brazil Reactivates Domestic Support Programs as Exports to the U.S. Rise," April 11, 2018.
[1347] The PEP and PEPRO programs are discussed in more detail in chapter 7. The 5.7% number was calculated as the per-unit program expenditure (total expenditure over program volume) divided by the per-unit market price.

Table 8.10 Estimated percentage change effects of Brazil's minimum support price, Latin American countries, 2023
mt = metric tons.

Country	Variable	Baseline value (0%)	Simulation 4a (2.5%)	Simulation 4b (5%)	Simulation 4c (10%)
Brazil	Nonaromatic production	10,661,663 mt	4.1	8.2	16.5
Brazil	Average consumer price	$420.5/mt	−1.8	−3.5	−6.8
Brazil	Total consumption	7,478,356 mt	2.0	4.0	8.0
Brazil	Nonaromatic exports	799,481 mt	10.8	22.4	48.3
Paraguay	Nonaromatic production	1,283,747 mt	−3.9	−7.6	−14.1
Paraguay	Nonaromatic exports	838,639 mt	−4.0	−7.8	−14.5
Uruguay	Nonaromatic production	1,441,006 mt	−1.8	−3.4	−6.3
Uruguay	Nonaromatic exports	890,825 mt	−2.0	−3.8	−7.0

Source: USITC estimates, accessed December 9, 2024.

Paraguay and Uruguay have little domestic rice consumption;[1348] therefore, analysis of these two countries in table 8.10 focuses on their production and exports. Results indicate that the increased exports that would result from an MSP increase in Brazil would substitute for exports of rice in Paraguay and Uruguay. If Brazil were to increase its MSP 10 percent above the market price, rice production in Paraguay would fall by 14.1 percent, or 181,612 mt, and rice production in Uruguay would fall by 6.3 percent, or 91,290 mt. Percentage changes in Paraguay and Uruguay rice production would be fairly large and would correspond to quantity changes of under 200,000 mt because, in the baseline, Paraguay and Uruguay are not large-scale rice producers.

Brazil's MSP policy would therefore have larger effects on rice producers in Latin America than on the United States. Effects on world consumption of rice would be ambiguous because the increase in rice production and exports from Brazil would be counteracted by a decrease in rice production and exports from countries that neighbor Brazil.

Simulation 5: Indian and Philippines Government-to-Government Contract

This simulation models a government-to-government contract between India and the Philippines by fixing rice exports from India to the Philippines at various levels, ranging from 50,000 mt to 295,000 mt. In the baseline version of the model, exports from India to the Philippines in 2023 are about 23,000 mt.[1349]

The government of India approved rice exports by National Cooperative Export Limited (NCEL) to several countries during 2023, including up to 295,000 mt of rice exports to the Philippines, despite Indian

[1348] USDA, FAS, "Grains," accessed various dates.
[1349] S&P Global, Total exports, HS heading 1006, rice, accessed August 30, 2024.

restrictions of rice exports to other markets.[1350] An export amount totaling 295,000 mt would be slightly less than 2 percent of all Philippines rice consumption in 2023,[1351] and would exceed the exports from India to the Philippines observed in the data.[1352] Government-to-government export contracts such as the contract between India and the Philippines could undermine U.S. competitiveness in the markets that would import U.S. rice.[1353]

The increase in exports to the Philippines under India's government-to-government contract would have essentially no effect on rice markets in the United States, regardless of the amount of rice exported from India to the Philippines. Unlike Cambodia, South Korea, or Japan, the Philippines is not a major destination for U.S. rice exports.[1354] Although government-to-government contracts in general have the potential to undermine U.S. competitiveness, an increase in trade between India and the Philippines would not affect U.S. rice producers.[1355]

Effects of the government-to-government contract on India also would be small, though they would be larger than the effects of the government-to-government contract on the United States. If India were to export 295,000 mt to the Philippines, the full amount permitted under the deal, consumption in India would fall by 0.1 percent, or slightly more than 60,000 mt, as a result of slightly higher domestic prices. The deal would affect outcomes in the Philippines: The counterfactual of 295,000 mt of exports through the government-to-government deal would result in a consumer price decrease of 0.40 percent and an increase of 0.50 percent in total consumption.

Simulation 6: Multilateral Removal of Tariffs

This model simulation would eliminate all import tariffs on nonaromatic rice for 15 individual countries and the two aggregated country groups. Results provide insight into the effects of tariff removal as well as an understanding of how multilateral trade policies may affect rice markets differently from the unilateral policies studied in simulations 1–5.[1356] Simulation 6 does not remove TRQs imposed by any markets because it is not computationally feasible while simultaneously removing all import tariffs; a

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[1350] NCEL is a national cooperative association set up by the Ministry of Cooperation under the Multi-State Cooperative Societies Act (MSCS) of 2002. NCEL is designed to primarily promote agricultural commodity exports for the benefit of farmers. NCEL is managed by a five-member board of directors, one of whom is a government official from the National Cooperative Development Corporation (an agency within the Ministry of Cooperation). No Indian government rice was exported under the exemption, instead private exporters were allowed to contract and ship the quantities via the NCEL. NCEL, "Organizational setup," accessed December 20, 2024; NCDC, "Genesis and Functions," accessed December 20, 2024; Sarangi, "Export of Non-Basmati White Rice," October 18, 2023; for more information, see chapter 5.
[1351] USDA, FAS, "Grains," accessed various dates.
[1352] S&P Global, Total exports, HS heading 1006, rice, accessed August 30, 2024.
[1353] USITC, hearing transcript, April 30, 2024, 89 (testimony of Peter Bachmann, USA Rice).
[1354] S&P Global, GTAS database, Total exports, HS heading 1006, rice, accessed August 30, 2024.
[1355] More broadly, countries that are prominent destinations for U.S. rice exports do not maintain government-to-government contracts with other countries. FAO, "Commodity Policy Developments," accessed September 4, 2024.
[1356] The 2015 USITC rice report found that a multilateral removal of all tariffs would have the largest impact on the U.S. rice industry when compared with the multilateral removal of other governmental policies such as producer subsidies. This simulation therefore also provides some parallels and continuity with the 2015 report, although it does not present comprehensive findings about all governmental policies related to rice. USITC, *Rice: Global Competitiveness*, April 2015, 353.

change in the TRQ on rice imports in Japan is studied in simulation 2. Simulation 6 would affect international rice markets more than simulations 1–5 and reflects a policy change in many countries rather than in a single country. Therefore, simulation 6 is not directly comparable with simulations 1–5, which were chosen to reflect real-world conditions or recent or historical policy changes in international rice markets.

Several countries in East Asia, Southeast Asia, and South Asia, including India, the Philippines, and Thailand, levy tariffs with an ad valorem equivalent of more than 25 percent. In contrast, Brazil, Burma, Cambodia, and Uruguay maintain average tariffs on rice of under 10 percent. The United States levies an ad valorem equivalent rate of less than 2 percent.[1357] Tariff rates for the developed- and developing-country groups are estimated as a weighted average of tariff rates in the countries that constitute those groupings; aggregate rates would be 3.79 percent for developed countries and 14.3 percent for developing countries.[1358]

Model results indicate that removing all tariffs on rice would lead to a 0.8 percent increase in consumer prices in the United States, as well as a 1.0 percent increase in producer prices (table 8.11). Production of nonaromatic rice would increase by 709,359 mt, or 7.1 percent of its baseline level,[1359] and U.S. exports would increase by 565,251 mt, or 41.4 percent from the baseline. Because the United States is a net exporter of nonaromatic rice (table 8.1) and U.S. tariffs are relatively low,[1360] the positive effect on production and exports of increased access to foreign markets would outweigh the negative effect of having more competition from imports. The absence of import tariffs in export destinations would induce U.S. rice producers to sell their rice production abroad rather than domestically, so U.S. domestic prices would rise and domestic consumption would fall, even though rice production in the United States would have expanded.

Table 8.11 Estimated percentage change effects of eliminating tariffs on rice, United States, 2023
mt = metric tons.

Variable	Baseline Value (0%)	Simulation 6 Change
Average consumer prices	$588.93/mt	0.8
Producer prices	$427.7/mt	1.0
Total consumption	6,928,351 mt	−0.5
Nonaromatic production	9,939,077 mt	7.1
Nonaromatic exports	1,366,976 mt	41.4
Nonaromatic imports	599,279 mt	3.8
Producer revenue	$4,250,843,759	8.2
Producer profit	$586,616,439	8.2

Source: USITC estimates, accessed December 9, 2024.

[1357] UNCTAD, TRAINS, WITS database, “Tariff-View and Export Raw Data,” accessed various dates.
[1358] Calculations by USITC. Data from UNCTAD, TRAINS, WITS database, “Tariff-View and Export Raw Data,” accessed various dates; S&P Global, Total exports, HS heading 1006, rice, accessed August 30, 2024.
[1359] Estimated changes in U.S. production and exports would be lower than those estimated in the 2015 USITC rice report, even though tariffs on U.S. rice exports did not decrease significantly between 2013, the year modeled in the 2015 report, and 2023. For further discussion on the difference between the two models, see the modeling appendix. USITC, *Rice: Global Competitiveness*, April 2015, 363.
[1360] UNCTAD, TRAINS, WITS, “Tariff-View and Export Raw Data,” accessed various dates.

Results for countries outside the United States are shown for the three largest exporters of rice and the three largest importers of rice, as well as the developing country group (table 8.12).[1361] The removal of all tariffs on rice would result in higher consumer prices in Thailand and Vietnam and lower prices in China, India, Indonesia, the Philippines, and the group of developing countries. Although both Indonesia and the Philippines would import large amounts of rice,[1362] tariffs in the Philippines are substantially higher than in Indonesia.[1363] As a result, the elimination of tariffs would cause prices to fall significantly in the Philippines but not in Indonesia. Although India's tariff on rice is high, tariff elimination results show almost no impact on domestic prices because, in this simulation, the country's export ban is assumed to remain in effect, meaning domestic supply would remain high and would lessen the demand for imports. Total consumption of rice in China would change by less than 1 percent, even when its tariff of more than 50 percent would be eliminated, because rice consumed by China domestically would continue to be grown mostly domestically.[1364] Changes in tariffs would have little effect on domestic prices.

Table 8.12 Estimated percentage change effects of eliminating tariffs on rice, by country, 2023
MFN = most-favored nation.

Country	Initial MFN tariff rate (ad valorem equivalent)	Average consumer price	Total consumption	Nonaromatic rice production	Nonaromatic rice imports
India	77.5	−0.1	0.0	−0.1	559.5
Thailand	52.0	0.8	−1.3	19.3	194.3
Vietnam	35.0	1.4	−1.6	29.9	1.8
China	51.3	−1.0	0.8	−2.1	202.5
Indonesia	5.5	−0.5	0.9	−0.4	14.4
Philippines	39.0	−12.1	9.0	−29.4	143.8
Developing-country group	14.3	−2.7	1.4	-6.3	32.8

Source: USITC estimates, accessed December 9, 2024; UNCTAD, TRAINS, WITS database, "Tariff-View and Export Raw Data," accessed various dates.
Note: Because of space constraints, table 8.12 does not present baseline values for the counterfactual results presented. These baseline values are present in all other tables.

Imports would increase in every country because the elimination of tariffs on rice reduces barriers to trade. Import increases would be especially large in China and the Philippines, two countries that would import large quantities of rice and currently charge high tariffs on their rice imports.[1365] Large percentage increases in India and Thailand, however, primarily would be caused by the low import quantities each country would have in the baseline;[1366] in both countries, changes of over 100 percent would correspond with quantity changes of less than 100,000 mt.

The changes in prices resulting from tariff elimination would be positively correlated with changes in rice production and inversely correlated with changes in consumption. An increase in imported rice would

[1361] As discussed earlier in chapter 8, India, Thailand, and Vietnam are the largest exporters of rice while China, Indonesia, and the Philippines are the largest importers of rice. S&P Global, GTAS database, Exports, HS heading 1006, accessed August 30, 2024.
[1362] S&P Global, Total exports, HS heading 1006, rice, accessed August 30, 2024.
[1363] UNCTAD, TRAINS, WITS database, "Tariff-View and Export Raw Data," accessed various dates.
[1364] USDA, FAS, "Grains," accessed various dates.
[1365] S&P Global, Total exports, HS heading 1006, rice, accessed August 30, 2024.
[1366] S&P Global, Total exports, HS heading 1006, rice, accessed August 30, 2024.

result in substitution for domestic production in Indonesia, the Philippines, and the developing-country group, as well as production decreases and consumption increases. Major exporters Thailand and Vietnam would increase their production by 3,790,103 mt, or 19.3 percent, and 10,324,087 mt, or 29.9 percent, respectively. However, lower trade barriers would cause producers in those countries to export rice rather than sell it at home. With less rice available domestically, domestic consumption would decrease as consumer prices rise.

While simulation 6 would affect international rice markets more than simulations 1-5, a direct comparison of the multilateral tariff removal in simulation 6 with unilateral policies in simulations 1–5 is difficult because, unlike the policy counterfactuals discussed in those simulations, the 100 percent removal of import tariffs was not chosen to reflect real-world conditions or recent or historical policy changes in international rice markets, and, moreover, it reflects a policy change in many countries rather than a policy change in one or two countries. The magnitude of a full tariff removal would be greater than would the more incremental policy changes presented in simulations 1–5, and would therefore generate larger effects on U.S. rice markets even if tariff removal in general were a less consequential policy.

Food Security

The Commission model can provide insight into how the six government policies described in the simulations above may influence food security in developing countries. One of the key model outputs is the change in quantity of rice consumption in each country as a result of the policy shocks that are simulated.

The USDA Economic Research Service provides a suite of indicators that it uses to assess food security in developing nations, one of which is a calorie gap index. The calorie gap index for each country is equal to the gap between the average caloric intake that a person living a moderately active lifestyle requires to be considered food secure (2,100 kilocalories per day) and the average daily per capita consumption in the country, with decreases in the calorie gap indicating greater food security.[1367] Converting the changes in consumption produced by the model into kilocalories per day per capita, the model can be used to estimate changes in this calorie gap index.

Table 8.14 presents estimates, in percentages, of the change in the calorie gap index for all developing countries[1368] in the model, including individual developing countries, as well as the aggregated developing-country group, as a result of the policy changes described in simulations 1–6. Results are presented as a range in parentheses with the smallest magnitude value (from simulation a) followed by the highest magnitude value (from simulation c) except for simulation 6 where there is only one simulation.

[1367] USDA, FAS, “Global Food Security Snapshot,” accessed various dates.
[1368] The World Bank defines developing countries as countries meeting its criteria for low-income or lower-middle-income countries. World Bank, “World Bank Country and Lending Groups – World Bank Data Help Desk,” accessed July 8, 2024.

Table 8.14 Estimated percentage change effect of each simulation on the USDA Economic Research Service Calorie Gap Index

MSP = minimum support price; ** = change is less than 0.05% in magnitude.

Country	Simulation 1 (Removal of India's export ban)	Simulation 2 (Increase in Japan TRQ)	Simulation 3 (Thailand export charges)	Simulation 4 (Brazil MSP)	Simulation 5 (India-Philippines rice contract)	Simulation 6 (Multilateral tariff removal)
Bangladesh	(0.1, 0.6)	(0.0, 0.0)	(**, −0.2)	(0.0, 0.0)	(0.0, 0.0)	−0.3
Burma	(**, −0.2)	(0.0, 0.0)	(**, 0.2)	(0.0, **)	(0.0, **)	11.0
Cambodia	(**, −0.3)	(0.0, **)	(**, 0.2)	(0.0, **)	(0.0, 0.0)	7.0
India	(0.5, 2.4)	(0.0, 0.0)	(0.0, **)	(0.0, 0.0)	(**, 0.2)	**
Indonesia	(−0.1, −0.4)	(0.0, 0.1)	(1.1, 3.5)	(0.0, 0.0)	(0.0, **)	−3.8
Pakistan	(**, −0.2)	(0.0, 0.0)	(**, 0.1)	(0.0, **)	(0.0, 0.0)	2.8
Philippines	(0.0, **)	(0.0, 0.0)	(0.1, 0.4)	(0.0, 0.0)	(−0.1, −2.1)	−36.5
Vietnam	(−0.8, −4.5)	(0.0, 0.0)	(0.1, 0.2)	(0.0, **)	(0.0, −0.1)	12.9
Developing-country group	(−0.1, −0.3)	(0.0, 0.0)	(**, 0.1)	(**, −0.1)	(0.0, 0.0)	−0.4

Source: USITC estimates, accessed December 9, 2024.

Results in table 8.14 show that the unilateral policy measures modeled in simulations 1–5 would not strongly affect calorie gaps; simulations 1 and 3 would produce the largest changes in developing countries' calorie gaps. A removal of India's export ban would increase the calorie gap in India because of renewed rice outflows; its removal would also decrease the calorie gap in Vietnam as Vietnam's rice exports would decrease, and would enable domestic rice consumers in Vietnam to consume more rice. Export charges imposed by Thailand would decrease food security in major importers Indonesia and the Philippines as a result of the loss of rice from Thailand. In addition, the government-to-government export contract in simulation 5 would result in a modest decrease in the Philippines' calorie gap and would cause a small increase in India's calorie gap, assuming no further intervention by India, because India would send slightly more rice to Philippines than it would in the baseline.

Simulations 2 and 4 would produce negligible changes in the calorie gap index for the developing countries surveyed in table 8.14. Simulation 2 involves a policy change that would have been initiated by a high-income country, Japan, which would primarily affect high-income or upper-middle-income countries,[1369] MSP changes in simulation 4 would primarily affect high-income or upper-middle-income countries in Latin America.

Removing tariffs for all bilateral flows (simulation 6) would result in a large increase in rice imports and consumption overall, which in turn would decrease the average calorie gap in countries that benefit from those increases. However, some countries would have a calorie gap increase. For example, Vietnam is a major producer and exporter of rice.[1370] The decrease in trade barriers would increase the amount of rice that would be exported, while simultaneously decreasing domestic consumption and increasing Vietnam's calorie gap index. Another example is Cambodia, a major importer of rice with relatively low initial tariffs.[1371] The elimination of all tariff barriers would divert rice to countries that would experience

[1369] World Bank, "World Bank Country and Lending Groups – World Bank Data Help Desk," accessed July 8, 2024.
[1370] USDA, FAS, "Grains," accessed various dates.
[1371] USDA, FAS, "Grains," accessed various dates.

larger reductions in barriers, decrease imports of rice in Cambodia, and increase Cambodia's calorie gap index.

This section represents changes in food security using changes in the calorie gap index for each country's overall population. Because this calorie gap index is calculated using average daily per capita rice consumption, results presented in table 8.14 do not assess the distribution of changes in food security within a country. Changes in rice consumption for some demographic groups might differ from changes in total rice consumption across the whole country.

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Chapter 9
Impact of Foreign Exports on the U.S. Rice Industry

Introduction

The U.S. rice industry competes with global exporters in the U.S. market and foreign markets. In the United States, domestic production is the source of about 80 percent of rice consumption. U.S. rice imports are increasing to meet growing demand, particularly for aromatic rice from Thailand and India.[1372] Aromatic rice (jasmine and basmati) is highly valued by U.S. consumers for its aroma and flavor, both as table rice prepared at home and in restaurants and foodservice. U.S. production of aromatic varieties remains small, necessitating imports. Medium grain and other rice types constitute a small share of the U.S. import market relative to aromatic varieties.

U.S.-produced rice of all types and varieties competes with other sources of rice in export markets. As a net exporter of rice, the U.S. rice industry depends on foreign markets, which receive about half of the rice crop each year. The United States is the world's largest exporter of paddy rice. U.S. paddy rice is primarily exported throughout the Western Hemisphere, particularly to Mexico and various Central American markets, where it faces growing competition from South American producers. For long grain rice, more than 70 percent of U.S. exports are shipped to Haiti and Iraq. Finally, U.S. medium grain rice is primarily produced in California and exported to Japan, but also to Canada and South Korea, where consumer preferences and trade agreements provide market access to U.S. rice producers.

The United States exports to a large number of markets, and export volumes have generally been consistent over the time frame examined in this report, with a few notable exceptions: The United States lost market shares in Mexico's paddy rice market and in the medium grain rice markets of Jordan, South Korea, and Taiwan. Each of these markets has its own dynamics and set of competitors. Broadly, U.S. export competition in its important export markets comes from lower-priced Asian suppliers of long grain white rice and South American suppliers of lower-priced paddy and white rice.

Competition in the U.S. Market

The United States is a significant consumer of all types of rice, which are supplied by both domestic production and imports.[1373] The domestic industry's share of the U.S. market varies considerably by rice

[1372] Caraway, "USA-Grown Rice Rules Domestic Market," December 15, 2023.
[1373] Import data presentations in this section that include breakouts for aromatic rice are limited to 2021–23 because those are the years after changes were introduced to the HTS to capture imports of aromatic rice varieties, which constitute more than half of U.S. imports. Effective July 1, 2020, HTS statistical reporting numbers 1006.20.4020 (brown long grain) and 1006.30.9055 (white long grain) were discontinued and replaced with 1006.20.4025 (brown long grain basmati), 1006.20.4035 (other brown long grain), 1006.30.9057 (white long grain jasmine rice), 1006.30.9059 (white long grain basmati rice), and 1006.30.9061 (other white long grain). USITC, "2020 HTSA (Rev. 14)," July 8, 2020.

type. Between 2018 and 2023, imports made up nearly 97 percent of the U.S. market for aromatic rice, 15 percent of the market for medium and short grain rice, and less than 10 percent of the market for white long grain rice. As described in chapter 4, U.S. imports of rice have generally increased over time, particularly of aromatic rice from Thailand and India.

Aromatic Rice

The U.S. market for aromatic rice exhibited strong growth during 2018–23, a continuation of a longer-term trend toward rising consumer demand for these varieties. Imports supplied the vast majority of this demand, despite some recent efforts to increase domestic aromatic rice production. As a result of limited domestic production and high consumer demand, aromatic rice is the largest category of U.S. rice imports. Between 2021 and 2023, white jasmine rice made up 38 percent of total U.S. rice imports by volume, and white basmati rice accounted for 17 percent.[1374]

The increase in U.S. demand for aromatic rice comes largely from a growing Asian-American population, as well as the increasing popularity of Asian foods among the general population.[1375] Americans with ethnic ties to Southeast Asia or South Asia may prefer aromatic rice imported from their regions of origin.[1376] In addition, according to U.S. industry representatives, demand for aromatic rice is crowding out demand for nonaromatic long grain rice even among segments of the U.S. population that have historically preferred nonaromatic rice, such as Chinese Americans.[1377] These changing consumer preferences have led to the increased use of jasmine rice in the foodservice segment, where it is increasingly offered on restaurant menus.[1378] Similarly, U.S. consumer demand for the distinct aroma and flavor of basmati rice is strong, particularly for use in Indian and Mediterranean dishes.[1379] When consumers buy aromatic rice in retail stores, recognition of origin may factor into purchase decisions because they are likely to associate jasmine rice with Thailand and basmati rice with India.[1380]

The U.S. industry does not produce aromatic rice in large volumes.[1381] However, the U.S. industry recognizes the growing market for aromatic rice and has made extensive efforts to develop varieties that are adaptable to conditions in the domestic rice-growing regions. The U.S. rice industry has reportedly made strong progress over the past 10–15 years in breeding domestic jasmine rice that fulfills desired agronomic and cooking characteristics (flavor and texture).[1382] Specifically, these domestic varieties have reportedly competed well against Thai jasmine rice in blind taste tests.[1383] One industry representative reported that efforts to develop U.S.-grown basmati rice have not progressed as much as

[1374] The first year U.S. trade data for aromatic rice were available was 2021. USITC DataWeb/Census, HTS subheading 1006.30.90, accessed August 2024.
[1375] Ehmke and Hamilton, *Fragrant Rice: Opportunity or Threat*, September 2021, 3.
[1376] Industry representatives, interview by USITC staff, May 1, 2024.
[1377] Industry representatives, interview by USITC staff, May 1, 2024.
[1378] Boyd, "Success Is in the Air," December 1, 2019.
[1379] USA Rice, "U.S. Rice Varieties," accessed September 3, 2024.
[1380] Ehmke and Hamilton, *Fragrant Rice: Opportunity or Threat*, September 2021, 4; industry representatives, interview by USITC staff, May 1, 2024.
[1381] Ehmke and Hamilton, *Fragrant Rice: Opportunity or Threat*, September 2021.
[1382] Industry representatives, interview by USITC staff, May 1, 2024.
[1383] Industry representatives, interview by USITC staff, May 1, 2024.

those for jasmine rice.[1384] An additional obstacle for U.S.-grown aromatic rice is that grocery retailers are reportedly reluctant to stock it because the volume available is somewhat limited and they believe that shoppers will prefer the imported brands that they recognize.[1385] Despite these challenges, demand for domestically grown aromatic rice was temporarily boosted following the COVID-19 pandemic because there were fewer imports of these varieties as a result of international shipping challenges at that time. U.S. farmers, particularly in southwestern Louisiana, were able to increase domestic production and sales of aromatic rice.[1386]

Data for 2021–23 (when import data specific to aromatic rice became available) show that U.S. aromatic rice imports returned to historical levels as effects of the pandemic eased and continued to increase commensurate with rising demand. Between 2021 and 2023, U.S. imports of white long grain jasmine and basmati rice increased by 39 percent and 60 percent, respectively, by volume. Thailand is by far the largest supplier of jasmine rice to the U.S. market. During 2021–23, Thailand was the source of about 97 percent of imports of this rice variety (table 9.1). India is the leading supplier of basmati rice to the U.S. market (table 9.2), representing most U.S. imports of basmati rice (81 percent by volume), with smaller quantities also supplied by Pakistan (9 percent) and Thailand (7 percent).

Table 9.1 United States: imports of white long grain jasmine rice, by trade partner, 2021–23
In thousands of metric tons.

Trade partner	2021	2022	2023
Thailand	356	475	494
Vietnam	7	11	11
All other	3	4	3
Total	366	490	508

Source: USITC DataWeb/Census, HTS statistical reporting number 1006.30.9057, accessed August 2024.

Table 9.2 United States: imports of white long grain basmati rice, by trade partner, 2021–23
In thousands of metric tons.

Trade partner	2021	2022	2023
India	117	169	197
Pakistan	17	17	21
Thailand	10	17	16
All other	4	7	2
Total	148	210	237

Source: USITC DataWeb/Census, HTS statistical reporting number 1006.30.9059, accessed August 2024.

Medium and Short Grain Rice

U.S. demand for medium and short grain rice is growing, supplied by both domestically grown rice (85 percent), mostly from California, and imports (15 percent). White medium grain rice accounted for 14 percent of total U.S. rice imports by volume in 2023, and short grain rice made up an additional 3 percent. Medium grain rice and short grain rice are somewhat interchangeable with one another because both types are stickier than long grain types when cooked and both are used in popular dishes

[1384] Industry representatives, interview by USITC staff, May 1, 2024.
[1385] Industry representatives, interview by USITC staff, May 1, 2024.
[1386] Caraway, "USA-Grown Rice Rules Domestic Market," December 15, 2023.

such as sushi.[1387] Medium grain rice is much more common in the U.S. market than short grain rice because it is more widely produced, both in the United States and in major exporting countries. Both types are discussed together in this section, consistent with common practice in rice industry publications.

U.S. producers of medium and short grain rice report that the U.S. market is generally stable and reliable, partly because buyers generally recognize the consistent quality of Calrose rice, which supplies the majority of U.S. production of medium grain rice.[1388] Domestically, U.S. white medium grain rice is sold primarily through ethnic or specialty market food distributors and to a lesser degree through industrial food processors, retail grocery stores, and broadline foodservice distributors.[1389] One major California rice mill stated that about half of its sales are to retail (mostly through ethnic or specialty market distributors, as noted above) and half are to foodservice.[1390] Another California producer noted that U.S. sushi restaurants are a reliable market because most of the rice used in these restaurants is domestically produced Calrose rice.[1391]

One medium grain market where U.S. producers have lost competitiveness is in Puerto Rico, a U.S. territory that has long demanded medium grain rice. Since 2018, U.S. rice has been largely replaced in Puerto Rico by lower-priced imports of white medium grain rice from China. Nearly all these shipments are sourced from China's government-accumulated stocks and sold at discounted prices. Additionally, U.S. suppliers face higher freight costs for rice shipped to Puerto Rico than they would otherwise as a result of provisions of the U.S. Jones Shipping Act of 1920 (Jones Act); the provisions require that rice shipped to Puerto Rico be transported on U.S.-flagged vessels, and this reportedly further hinders U.S. competitiveness in the market.[1392] According to a USDA report, Puerto Rico frequently changes its sources of medium grain rice depending on price, so shipping costs—including costs incurred because of the Jones Act—can be a determining factor in sourcing.[1393]

Increased imports of medium grain rice in Puerto Rico were part of an overall uptick in U.S. imports of medium and short grain rice. During 2018–23, U.S. imports of white medium grain rice increased by 31 percent (from 147,000 mt in 2018 to 193,000 mt in 2023) (table 9.3). China was the source of 40 percent of U.S. imports of white medium grain rice for most of this period. Other consistent suppliers of white medium grain rice were Thailand and India. During 2022–23, the United States also imported 34,000 mt of white medium grain rice from Australia to make up for the drought-related supply shortage in California.[1394]

[1387] USA Rice, "Part V: Additional Resources," accessed December 9, 2024, 47.
[1388] Grown in California and increasingly in other countries such as Australia and Vietnam, Calrose is a variety of medium grain white rice known for having a sticky texture.
[1389] USA Rice, *U.S. Rice Domestic Usage Report for the Marketing Year 2021–2022*, 14.
[1390] Industry representative, interview by USITC staff, August 27, 2024.
[1391] Industry representative, interview by USITC staff, August 27, 2024.
[1392] Industry representative, interview by USITC staff, July 29–August 1, 2024; USDA, ERS, "U.S Rice Imports in 2019 Are Projected at a Record High for Third Consecutive Year," March 30, 2020.
[1393] USDA, ERS, *A Deeper Look Into the USDA Crop Baseline Projections*, November 2019, 28.
[1394] USDA, ERS, "Rice Sector at a Glance," September 27, 2023.

Table 9.3 United States: imports of white medium grain rice, by trade partner, 2018–23
In thousands of metric tons. ** = rounds to 0 (less than 500 metric tons).

Trade partner	2018	2019	2020	2021	2022	2023
China	65	64	64	64	85	85
Thailand	52	63	72	53	53	45
India	21	25	42	47	47	36
Australia	4	**	**	0	17	17
All other	5	5	9	7	8	10
Total	147	157	188	171	210	193

Source: USITC DataWeb/Census, HTS statistical reporting number 1006.30.9065, accessed August 2024.

Imports of white short grain rice are small but growing rapidly. The volume of U.S. imports doubled from 24,000 mt in 2018 to 48,000 mt in 2023 (table 9.4). The top suppliers in 2023 were Thailand, India, Vietnam, and Japan. All of these suppliers, except India, grew their exports substantially over the period. Vietnam and Japan, in particular, each increased their exports of short grain white rice to the United States from less than 1,000 mt in 2018 to more than 5,000 mt in 2023. Although this represents only a small volume of trade, California producers have raised concerns that exports from Japan are growing because of export promotion programs in that country and are likely to continue to grow given Japan's declining population and per capita rice consumption.[1395] A publication by the U.S. rice industry notes that in 2018, the first year after Japan's new promotion programs took effect, Japanese production of rice intended for export markets more than doubled.[1396] California producers are concerned that this would displace U.S. domestic production in the U.S. market for specialty short grain rice (e.g., the koshihikari variety), which is a high-value niche market.[1397]

Table 9.4 United States: imports of white short grain rice, by trade partner, 2018–23
In thousands of metric tons. ** = rounds to 0 (less than 500 metric tons).

Trade partner	2018	2019	2020	2021	2022	2023
Thailand	10	10	16	12	13	15
India	7	6	10	5	7	8
Vietnam	**	**	**	1	2	5
Japan	1	1	2	2	3	5
All other	6	9	8	8	9	14
Total	24	26	36	27	34	48

Source: USITC DataWeb/Census, HTS statistical reporting number 1006.30.9075, accessed August 2024.

Nonaromatic White Long Grain Rice

Imports of nonaromatic white long grain rice have increased in recent years. U.S. imports increased by 63 percent, from 105,000 mt in 2021 to 171,000 mt in 2023 (table 9.5). Domestically grown rice supplies the vast majority of U.S. demand for nonaromatic long grain rice, but the increase in U.S. imports over this period suggests that foreign suppliers are gaining modest market shares in this segment. Thailand is the leading source for U.S. imports of nonaromatic white long grain rice, supplying more than three-fourths of those imports each year from 2021 through 2023. During those three years, U.S. imports from

[1395] Industry representative, interview by USITC staff, August 27, 2024.
[1396] Fukuda and Conner, *Japan Rice Exports and Policy Overview*, June 2020, 4.
[1397] Industry representative, interview by USITC staff, August 27, 2024.

Thailand increased by 66 percent, from 79,000 mt in 2021 to 131,000 mt in 2023, driving most of the overall growth for this rice category.

Table 9.5 United States: imports of nonaromatic white long grain rice, by trade partner, 2021–23
In thousands of metric tons.

Trade partner	2021	2022	2023
Thailand	79	119	131
Vietnam	2	2	9
Brazil	5	7	9
India	5	12	6
All other	14	16	16
Total	105	156	171

Source: USITC DataWeb/Census, HTS statistical reporting number 1006.30.9061, accessed August 2024.

Because nonaromatic rice is a small share of overall U.S. rice imports from Thailand and U.S. import data distinguishing between aromatic and nonaromatic rice only became available in 2021, the drivers of increased U.S. nonaromatic rice imports are not clear. Nonaromatic rice from Thailand does not appear to be widely available in U.S. retail markets. In some instances, food distributors that import jasmine rice from Thailand likely also import smaller quantities of nonaromatic long grain rice from the same companies to repack or use in foodservice.[1398] The U.S. rice industry believes that, in other instances, these imports from Thailand might have been jasmine rice that were misclassified because of the introduction of new HTS statistical reporting numbers for aromatic rice in 2021.[1399] Vietnam, Brazil, and India also supply much smaller quantities of nonaromatic white long grain rice to the U.S. market, and imports from all these sources increased between 2021 and 2023.

Competition in U.S. Export Markets

The U.S. rice industry exports many rice types, offering a diverse product mix to appeal to buyers in various markets. Paddy, long grain white, and medium grain white rice constituted the largest shares of U.S. exports, for a combined 86 percent of exports in 2023 (table 9.6). The United States is the world's largest supplier of paddy rice; exports of paddy rice made up 44 percent of total U.S. rice exports in 2023. Long grain and medium grain white rice exports made up 28 and 15 percent of the total, respectively.

[1398] Industry representative, email correspondence with USITC staff, November 5, 2024.
[1399] Industry representative, email correspondence with USITC staff, November 5, 2024.

Table 9.6 United States: rice exports, by type, 2018–23

In thousands of metric tons.

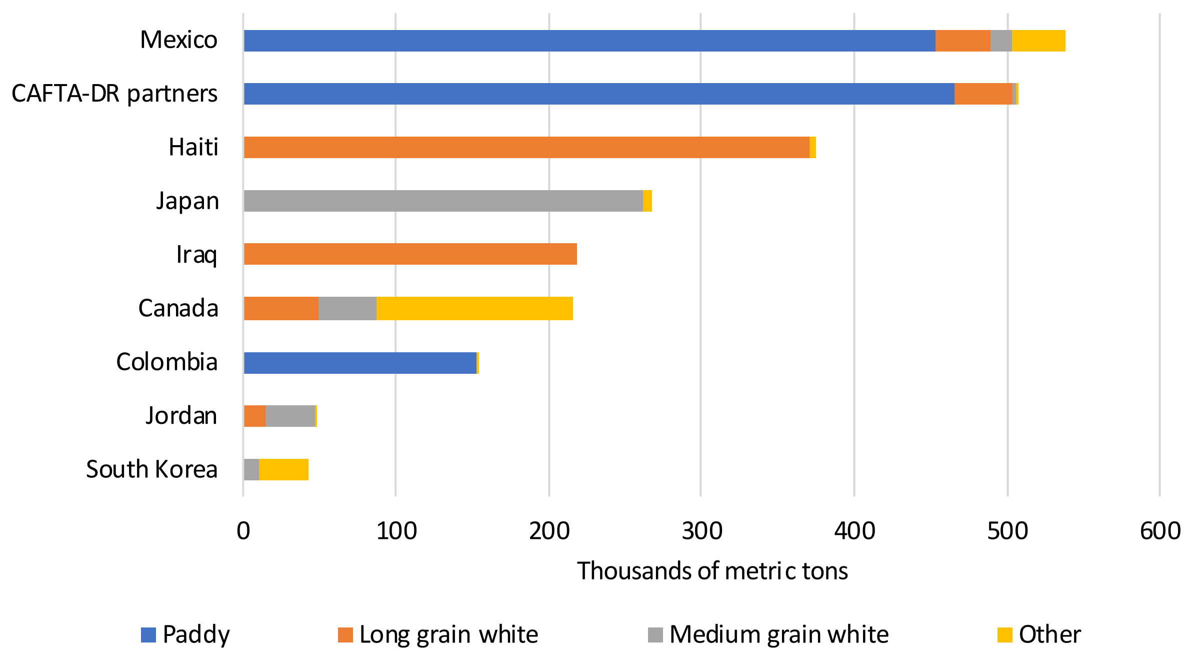
Rice type	2018	2019	2020	2021	2022	2023
Paddy	1,353	1,603	1,374	1,500	958	1,206
Long grain white	776	823	649	764	665	773
Medium grain white	550	666	652	634	406	403
Parboiled rice	208	215	190	185	166	154
Brown rice	149	213	267	183	179	108
White short grain and mixtures	94	59	102	93	75	69
Brokens	60	63	59	53	40	40
Total	3,191	3,642	3,292	3,411	2,489	2,753

Source: USITC DataWeb/Census based on HS subheadings and Schedule B numbers under HS subheading 1006, accessed August 2024.

Although the United States exports a diverse mix of rice types, most of its major export markets concentrate their purchases on a single type of U.S. rice. Major markets in Latin America (Mexico, Central American countries, and Colombia) import mostly paddy rice from the United States (figure 9.1). Haiti and Iraq import mostly long grain white rice. Japan and Jordan import mostly medium grain white rice, and South Korea imports mostly medium grain brown rice. Canada is the only major market that imports a mix of rice types.

Figure 9.1 U.S. exports to major markets by rice type, 2023

In thousands of metric tons. Underlying data for this figure can be found in appendix F, table F.28.



Source: USITC DataWeb/Census based on HS subheadings and Schedule B numbers under HS subheading 1006.

Because buyers in U.S. export markets focus their purchases on specific types of rice that are largely not interchangeable, U.S. producers have limited opportunity to make up a decline in exports to a particular market. For example, from 2018 to 2023, total U.S. exports of paddy rice declined by 10.9 percent (table 9.7), mostly because U.S. paddy rice exports to Mexico declined by 31 percent and to Costa Rica by 86 percent. Paddy rice exports also declined to Guatemala and El Salvador. U.S. paddy rice exporters sought other markets for their rice, increasing shipments to other Central and South American markets that had demand for paddy rice, including Honduras (12 percent increase), Colombia (43 percent increase), and Nicaragua (1,050 percent increase). Relatively few countries buy paddy rice, however, and these smaller markets did not fully make up for the lost sales from the United States to Mexico, its largest export market for paddy rice.

Table 9.7 United States: paddy rice exports, by trade partner, 2018–23
In thousands of metric tons.

Trade partner	2018	2019	2020	2021	2022	2023
Mexico	657	780	522	677	346	453
Honduras	187	147	113	154	129	209
Colombia	107	126	178	9	138	152
Nicaragua	10	128	92	110	114	115
Guatemala	119	113	81	117	111	83
Venezuela	41	52	91	247	0	77
Panama	16	44	15	24	64	57
El Salvador	78	77	74	86	30	49
Costa Rica	65	71	52	73	23	9
All other	74	65	154	2	1	1
Total	1,353	1,603	1,374	1,500	958	1,206

Source: S&P Global, Total exports, HS subheading 1006.10, rice in the husk (paddy or rough), accessed August 2, 2024.

Similarly, for long grain white rice, the United States experienced a drop in sales between 2018 and 2023 to its largest export market for this type of rice (Haiti). U.S. exports to Haiti averaged 51.9 percent of U.S. long grain white rice exports from 2018 to 2023 (table 9.8). Political instability in Haiti made delivery of U.S. rice exports more challenging in 2022 and 2023, as described in the section on the Haitian market below. U.S. exports to Iraq, the second-largest market for long grain rice, were highly inconsistent between 2020 and 2022 in part because of financing difficulties noted in the Iraq market section below. U.S. exports to Iraq increased in 2023, however, making up for the dip in exports to Haiti. This recovery in the Iraq market was well timed to avoid an overall dip in U.S. exports of long grain rice because, outside of Haiti and Iraq, other U.S. markets for long grain rice are much smaller. These smaller markets include Canada, Mexico, and the Dominican Republic, all of which are reliable markets offering logistics advantages for the United States.

Table 9.8 United States: long grain rice exports, by trade partner, 2018–23
In thousands of metric tons. ** = rounds to zero.

Trade partner	2018	2019	2020	2021	2022	2023
Haiti	407	448	452	401	382	370
Iraq	157	154	0	120	88	219
Canada	67	88	93	92	90	73
Mexico	43	38	47	46	39	41
Dominican Republic	18	22	36	26	21	36
Jordan	**	0	0	2	14	14
Taiwan	1	2	16	6	9	13
United Kingdom	17	4	17	21	22	12
Bahamas	5	5	5	5	5	5
Jamaica	3	3	4	4	4	4
All other	101	92	47	104	56	25
Total	819	856	719	825	730	813

Source: USITC DataWeb/Census based on HTS statistical reporting numbers 1006.20.4020 (rice, long grain, husked (brown)) and 1006.30.9010 (rice, semi-milled or wholly milled, long grain, not elsewhere specified or included), accessed August 2, 2024.

Export markets for U.S. medium grain rice were more stable than other rice types between 2018 and 2023. However, U.S. medium grain rice producers are reportedly looking for new markets to ensure long-term stability because the largest markets in East Asia are not growing. Japan, which mostly imports white medium grain rice, has been a top export market for U.S. medium grain rice producers for the past three decades and was the largest market for these exports in every year from 2018 to 2023 (table 9.9). As described in the Japan section below, levels of U.S. exports of medium grain rice were generally stable but limited by population decline and import restrictions in Japan. Other important markets for U.S. medium grain white rice during 2018–23 included Canada, Jordan, and Taiwan. South Korea was also an important U.S. medium grain rice destination, but it imports mostly medium grain brown rice (U.S. exports of brown medium grain rice are combined with white in table 9.9). South Korea manages its imports through a process described in the profile below, and U.S. rice producers did not fill 2023 tenders until December and then shipped the rice in 2024. That rice is recorded in 2024 trade data and, therefore, not reported in table 9.9.[1400]

[1400] U.S. government official, interview by USITC staff, August 22, 2023.

Table 9.9 United States: medium grain rice exports, by trade partner, 2018–23
In thousands of metric tons. ** = rounds to zero.

Trade partner	2018	2019	2020	2021	2022	2023
Japan	262	320	292	297	238	262
Canada	47	48	46	47	54	43
South Korea	111	149	191	156	98	42
Jordan	78	88	83	66	8	33
Taiwan	42	62	45	50	53	21
Mexico	18	13	15	14	15	14
Saudi Arabia	10	32	43	16	3	5
Israel	10	20	35	24	2	5
Belgium	**	1	4	5	2	4
Netherlands	5	4	3	9	8	3
All other	63	93	66	48	23	18
Total	647	829	823	732	500	451

Source: USITC DataWeb/Census based on HTS statistical reporting numbers 1006.20.4040 (rice, medium grain, husked (brown)) and 1006.30.9020 (rice, semi-milled or wholly milled, medium grain, not elsewhere specified or included), accessed August 2, 2024.

The markets profiled in the regional sections that follow include the largest U.S. rice export markets. These are Mexico, Central America (markets that are individually small, but collectively represent the second-largest U.S. rice market), Haiti, Canada, Japan, and Iraq. Within the regional sections, this chapter also gives information about U.S. exports to several smaller or emerging markets. As noted above, such markets are important to offset declines in U.S. exports to larger markets that import the same type of rice. The smaller markets described below include South Korea, Taiwan, Jordan, Türkiye, and Egypt. Within the market profiles, additional detail is given for markets that experienced significant changes either in the volume of U.S. rice exports or the U.S. competitive position between 2018 and 2023.

U.S. Competitiveness by Region

U.S. rice exports fell from 2018 to 2023, but U.S. rice producers continued to export large quantities of rice to the same markets year over year. Additionally, these markets continued to import the same type of rice from U.S. producers. However, U.S. market share fell in some of these markets. Changing consumer preferences, weather conditions, trade disputes, supply shortages, and fluctuating rice prices led some rice-producing and -consuming countries to impose changes to their trade policies to preserve their domestic industry, assure sufficient domestic rice supplies, or regulate prices. These changes impacted U.S. export competitiveness and, in some cases, led to declines in U.S. rice exports. However, owing in large part to bilateral trade agreements and geographic proximity, the United States maintains a competitive advantage in some rice markets.

Latin America

Geographic proximity, trade agreements, and consistent consumer demand for rice make Mexico and Central America important markets for U.S. rice exporters. In 2023, nearly 40 percent of U.S. paddy rice exports went to Mexico, and slightly more than 50 percent went to Central America.[1401] However, increased competition from South American paddy rice exporters, including Brazil and Uruguay, has lowered the U.S. market share in Mexico and some Central American countries. As such, overall U.S.

[1401] S&P Global, HS heading 1006, rice, accessed August 30, 2024.

paddy rice exports declined from 2018 to 2023, driven mainly by the 31 percent drop in U.S. exports of paddy rice to Mexico.

Rice consumers in Mexico and Central America are generally price sensitive, and competition in these markets is mostly based on price.[1402] Therefore, even small changes in tariff preferences can lead to large changes in market share. For this reason, the declines in U.S. exports to Mexico and Central America are associated with changes in import tariff rates faced by U.S. competitors, which eroded U.S. preferences under the United States-Mexico-Canada Agreement (USMCA) in the Mexican market and CAFTA-DR in Central America.

Mexico

In Mexico, the United States lost some of its share of an important and growing market. Mexican rice consumption is rising, driven by persistent food price inflation starting in 2021, which increased demand for relatively affordable foods like rice.[1403] Mexico's per capita consumption is relatively low compared to global rates, at approximately 8.5 kilograms (kg) per capita per year.[1404] Like other Latin American consumers, Mexican consumers prefer long grain rice with homogenous grain lengths and minimal chalky grains, uniform cooking, and minimal "stickiness."[1405] However, consumers in Mexico are also price sensitive, a trait which was exacerbated by rising food costs during the period.[1406] As a result, most competition in the Mexican rice market is based on price, not product differentiation.[1407] An average of about 12 percent of Mexico's rice consumption between MY 2021/22 and 2023/24 was produced domestically, and nearly all rice produced in Mexico is destined for human consumption in the domestic market (exports are about one percent of domestic consumption). Imports of both paddy and milled rice satisfy the remainder of Mexico's consumption.[1408]

Despite rising rice consumption and some government price support for Mexico's rice crop, the planted area for rice in Mexico has been decreasing in recent years because of lower profits from rice farming and competition from import sources.[1409] In response, some farmers switched to crops like sugarcane that require fewer inputs, command higher prices, and receive greater government support.[1410] The

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1402 Industry representative, interview by USITC staff, August 26–28, 2024.

1403 USDA, FAS, *Grain and Feed Update: Mexico*, January 25, 2024; Trading Economics, "Mexico Food Inflation," accessed November 11, 2024.

1404 For a cross-regional comparison of rice competitiveness, see chapter 3.

1405 Horizon Ag, "Horizon Ag Varieties Ranked High for Quality," accessed November 4, 2024; Fitchette, "Rice Quality at Heart of U.S. Market Share Woes," January 3, 2024; Angira, Guerra, and Deliberto, "Breeding Rice for Latin American Export Markets," June 17, 2022.

1406 Industry representative, interview by USITC staff, August 26–28, 2024; USDA, FAS, "Mexico Announces New Anti-Inflationary Program," October 4, 2022.

1407 Industry representative, interview by USITC staff, August 26–28, 2024; U.S. government official, interview by USITC staff, August 22, 2024.

1408 USDA, FAS, *Grain and Feed Update: Mexico*, September 27, 2023, 15–16; USRPA, "Market Update - Mexico's Rice Market in Transition," December 9, 2022.

1409 USDA, FAS, *Grain and Feed Annual: Mexico*, March 22, 2023, 14–15.

1410 The government of Mexico has a minimum purchase price program for grains operated by its food security program, *Seguridad Alimentaria Mexicana* (Segalmex). For rice, the price is guaranteed for purchases up to a certain volume from small and medium-sized growers. USDA, FAS, *Grain and Feed Update: Mexico*, January 25, 2024, 13; Government of Mexico, DOF, "ACUERDO por el que se dan a conocer las Reglas de Operación del longer-term trend of decreased planting area for rice coupled with lower domestic rice yields in recent years has put downward pressure on Mexico's overall domestic rice production.[1411]

Although this downward pressure on Mexican rice production drives demand for rice imports, Mexico's import volume of all rice types has fluctuated and decreased overall from 2018 to 2023 (table 9.10). These shifts in volume are largely a result of Mexican tariff-rate quota policy in the first years of the period, explained in greater detail in table 9.13 below.[1412]

Table 9.10 Mexico: total rice imports, by trade partner, 2018–23
In thousands of metric tons. ** = rounds to 0 (less than 500 metric tons).

Trade partner	2018	2019	2020	2021	2022	2023
United States	765	779	709	805	240	424
Brazil	0	1	99	0	236	96
Uruguay	78	27	37	53	25	94
Argentina	33	5	12	4	2	10
All other	135	**	72	9	**	1
Total	1,012	812	929	872	503	626

Source: S&P Global, General imports, HS heading 1006, rice, accessed November 5, 2024.

Between 2018 and 2023, the leading source countries of Mexico's rice imports varied as well. The United States continued to supply the majority of Mexico's rice imports, but its share of total rice imports slipped from 76.5 percent (by volume) in 2018 to 67.7 percent in 2023 because of increasing competition from Brazil in the paddy rice segment in particular (tables 9.11 and 9.12).

Table 9.11 Mexico: imports of paddy rice, by trade partner, 2018–23
In thousands of metric tons.

Trade partner	2018	2019	2020	2021	2022	2023
United States	677	720	651	737	196	349
Brazil	0	0	89	0	236	96
Uruguay	0	0	0	16	0	0
Guyana	88	0	0	0	0	0
Paraguay	20	0	48	0	0	0
Total	785	720	789	753	431	446

Source: S&P Global, General imports, HS subheading 1006.10, rice in the husk (paddy or rough), accessed November 5, 2024.

These import shifts in the paddy market are largely the result of price competition, as suggested by average unit values and changes to Mexican tariff policy (described in greater detail after table 9.12). Average unit values (AUVs) for paddy rice imported into Mexico suggest that during 2018–23, Brazil was able to offer Mexican paddy rice buyers a consistently lower price than the United States. In 2020,

Programa de Precios de Garantía a Productos Alimentarios Básicos [ACUERDO por el que se dan a conocer las Reglas de Operación del Programa de Precios de Garantía a Productos Alimentarios Básicos]," August 1, 2024; USDA, FAS, *Grain and Feed Update: Mexico*, September 27, 2023, 16.

1411 On the supply side, low summer 2022 rainfall in some of Mexico's largest rice-producing states and high chemical input costs led to lower-than-expected yields for Mexican rice producers for MY 2022/23. These low yields led to an estimated 20 percent decline in Mexican rice production totals from the previous marketing year (263,000 mt to 208,000 mt on a paddy basis). Drought conditions were also severe in Mexico's rice-producing states in summer 2023. USDA, FAS, *Grain and Feed Update: Mexico*, January 25, 2024, 13–15.

1412 USDA, FAS, *Grain and Feed Annual: Mexico, Slight Changes in Production as Grain Imports Continue Upward Trend*, March 7, 2018, 17.

Mexico's import AUVs for paddy rice from Brazil were about 5 percent lower than import AUVs for U.S. rice.[1413] In 2022, because of low water levels in the Mississippi River, U.S. exporters faced bottlenecks with barge shipping rice down the river, slowing exports to Mexico; import AUVs for paddy rice from Brazil were approximately 15 percent lower.[1414]

Table 9.12 Mexico: imports of milled rice, by trade partner, 2018–23

In thousands of metric tons. ** = rounds to 0 (less than 500 metric tons).

Trade partner	2018	2019	2020	2021	2022	2023
Uruguay	78	27	37	37	25	94
United States	74	51	52	66	45	74
Thailand	26	**	1	**	0	32
Argentina	33	5	12	4	2	10
Vietnam	**	0	0	0	0	1
Italy	**	0	0	**	**	**
India	**	0	0	0	0	**
Paraguay	**	0	23	9	0	0
Brazil	0	1	10	0	0	0
Total	213	83	134	117	72	212

Source: S&P Global, General imports, HS subheading 1006.30, semi-milled or wholly milled rice, whether or not polished or glazed, accessed December 13, 2024.

Despite these lower AUVs for Mexican rice imports from Brazil, U.S. rice shipments to Mexico remain competitive given the seasonality of rice supply and the short shipping distance from the United States

[1413] Rice is harvested in the second half of the calendar year in the United States and the first half of the year in Brazil. Monthly AUVs for paddy rice imported into Mexico from Brazil for the first and second half of 2020 averaged to $335.45/mt and $343.63/mt, respectively. During the same periods, AUVs for paddy rice imported into Mexico from the United States averaged to $354.46 and $362.74/mt. S&P Global, HS heading 1006, rice, accessed November 11, 2024; USDA, FAS, *Planting of Summer Crops Begins in Brazil*, September 22, 2017; USA Rice, "How Rice Grows," accessed January 8, 2025.

[1414] U.S. industry noted that the comparatively lower prices from Brazil were especially pronounced in 2022. In 2022, AUVs for Brazilian paddy rice were $349.96/mt and $432.27/mt for the first and second half of the year, respectively; AUVs for the United States over the same time period were $409.81/mt and $512.09/mt. S&P Global, HS heading 1006, rice, accessed August 30, 2024. Industry representative, interview by USITC staff, July 29–August 1, 2024. U.S. paddy rice to Mexico is more often shipped in bulk vessels rather than containers; these shipments experienced less freight cost pressure compared to rail and container shipments that impacted other rice shipments, which more frequently ship via container as described in chapter 3. Industry representative, interview by USITC staff, August 26–28, 2024; industry representatives, interviews by USITC staff, July 29–August 1, 2024. While rail is the U.S. rice industry's preferred mode of transport for domestic shipments, rice is most commonly exported to Mexico through the port of New Orleans via bulk vessels. USA Rice, "USA Rice Outlines Trade and Transportation Priorities," March 2, 2023; USITC DataWeb, HTS 1006.10 domestic exports by district, 2018–23, accessed August 28, 2024; USDA, FAS, *United States-Mexico Agricultural Trade Logistics Review*, December 23, 2022, 5–7, 26; USDA, AMS, *Transportation of U.S. Grains: A Modal Share Analysis, 1984–2022 Update*, September 2024, 7.

to Mexico.[1415] Rice is harvested in the second half of the calendar year in the United States and the first half of the year in Brazil, so U.S. and Brazilian rice supply availability does not often overlap.[1416]

The United States also supplied milled rice to the Mexican market and was the top exporter of milled rice to Mexico by volume from 2019 to 2022. The U.S. share of Mexican milled rice imports was relatively high (ranging from 34 percent to 63 percent each year from 2018 to 2023), despite competition from Uruguay (table 9.12).

For both paddy and milled rice imports, the drops in U.S. share of the Mexican market between 2018 and 2023 were driven by two factors described in the paragraphs that follow. First, import tariff changes during this period affected the relative cost competitiveness of import suppliers in the Mexican market. Second, Mexico's enforcement of sanitary and phytosanitary measures limited incoming shipments from Brazil and Uruguay in 2019.

The United States still exports a large volume of paddy and milled rice to Mexico, but its relative competitiveness in this market declined because of tariff preference erosion. In response to rising food prices and in an effort to diversify its sources of food imports, the Mexican government has historically made multiple adjustments to its tariff rates (table 9.13). These changes allowed for imports from other countries to compete against the United States and Uruguay, which benefit from tariff-free access to the Mexican market (the United States received tariff-free access under NAFTA, and later, the USMCA; Uruguay received tariff-free access under the Mexico-Uruguay Free Trade Agreement signed in 2004).[1417] For instance, the removal of duties on Mexican paddy imports in 2022 saw imports of paddy shipments from Brazil resume at high volumes in May 2022 and 2023 after no Brazilian import shipments were received in 2021.[1418] The removal of duties on Mexican milled rice imports in 2023 saw subsequent increases in import volumes in that year from Thailand, Argentina, Vietnam and India (countries without FTAs with Mexico). The U.S. share in Mexican milled rice imports decreased in 2023 compared to the previous year as a result of increased shipments from these markets and Uruguay, although the volume of U.S. milled rice shipments to Mexico increased by over 69,000 metric tons compared to 2022.[1419]

[1415] Shipments from Port Santos, Brazil (where most Brazilian rice is exported from) travel 5,442 nautical miles to Veracruz, Mexico (22 days at 10 knots), while shipments from New Orleans to Veracruz travel 810 nautical miles (3 days at 10 knots). Sea-Distances.org, Port Santos, Brazil to Veracruz, Mexico, accessed December 26, 2024; Sea-Distances.org, New Orleans, USA to Veracruz, Mexico, accessed December 26, 2024.
[1416] Industry representative, interview by USITC staff, August 26–28, 2024; industry representatives, interviews by USITC staff, Louisiana and Arkansas, July–August 2024; USDA, FAS, *Planting of Summer Crops Begins in Brazil*, September 22, 2017; USA Rice, "How Rice Grows," accessed January 8, 2025.
[1417] Mexico-Uruguay Free Trade Agreement (July 15, 2004).
[1418] These shipments entered under the Mexican Tariff Schedule subheading 1006.10.99.
[1419] These shipments entered under the Mexican Tariff Schedule subheading 1006.30.99.

Table 9.13 Mexico: changes to most-favored-nation tariffs and other trade measures on rice imports, 2008–2022

Date	Description
May 2008	The Mexican government eliminated its 20 percent tariff on milled and brown rice and the 9 percent tariff on paddy rice to lower consumer prices during the period of high food prices of 2007–08.
January 2015	Mexico reimposed a 9 percent tariff on imported paddy rice (and another tariff for other types of further processed rice) and reinstated its 20 percent tariff on brown, milled, and broken rice.
June 2016	Mexico issued a decree (June 8, 2016) implementing a policy responding to shortages in the domestic food supply, in an effort to lessen price effects on consumers.
March 2017	Because of shortages in the domestic food supply, Mexico opened a tariff-rate quota (TRQ) for beef and rice, allowing for 150,000 metric tons (mt) of rice to enter duty free. For rice exporters participating within quota, a maximum of 10,000 mt of rice per "requestor" was permitted, with certificates allocated on a first-come first-served basis. The TRQ was extended for all rice types until the end of 2019.[1]
August 2020	Because of economic pressures during the outbreak of the COVID-19 pandemic, Mexico reinstated a temporary TRQ under the above policy for 105,000 mt of paddy rice only, from any origin.[2]
May 2022	Responding to rising prices, the Mexican government instituted a presidential anti-inflation decree which allows paddy rice imports with zero tariffs from any trading partner with a sanitary and phytosanitary standards protocol with Mexico.[3]
January 2023	The Mexican government extended its presidential anti-inflation decree to allow milled rice imports with zero tariffs from any trading partner with a sanitary and phytosanitary standards protocol with Mexico.

Sources (in chronological order as presented in the table): USDA, FAS, *Mexico Publishes Tariff Modifications on Basic Commodities*, May 30, 2008; Government of Mexico, DOF, "DECRETO Por El Que Se Modifica La Tarifa de La Ley de Los Impuestos Generales de Importación y de Exportación [DECREE Amending the Tariff of the General Import and Export Tax Law]," May 27, 2008 (see also 2007 Mexican imports tariffs on rice in Government of Mexico, DOF, "DECRETO Por El Que Se Expide La Ley de Los Impuestos Generales de Importación y de Exportación [DECREE Issuing the General Import and Export Tax Law]," June 18, 2007, 39); USDA, FAS, *Mexico Announces Rice Tariffs*, December 16, 2014; Government of Mexico, DOF, "DECRETO Por El Que Se Modifica La Tarifa de La Ley de Los Impuestos Generales de Importación y de Exportación [DECREE Amending the Tariff of the General Import and Export Tax Law]," December 10, 2014; USDA, FAS, *Mexico Establishes TRQs but No Need to Worry*, June 9, 2016; Government of Mexico, DOF, "DECRETO Por El Que Se Establece El Arancel-Cupo [DECREE Establishing the Tariff-Quota]," June 8, 2016; USDA, FAS, *Mexico Modifies TRQs for Five Agricultural Products*, January 5, 2018; USDA, FAS, Mexico Modifies TRQs for Five Agricultural Products, January 5, 2018; Government of Mexico, DOF, "ACUERDO Por El Que Se Dan a Conocer Los Cupos Para Importar Carne de Res y Arroz [AGREEMENT Announcing Import Quotas for Beef and Rice]," March 1, 2017; USDA, FAS, *Mexico Announces Unilateral Rice TRQs*, September 9, 2020; Government of Mexico, DOF, "ACUERDO Por El Que Se Da a Conocer El Cupo Multianual [AGREEMENT Announcing the Multi-Year Quota]," September 7, 2020; USDA, FAS, *Grain and Feed Update: Mexico*, January 25, 2024; Government of Mexico, DOF, "Decree," May 16, 2022; Government of Mexico, DOF, "DECRETO por el que se exenta el pago de arancel de importación [DECREE exempting the payment of import duties]," January 6, 2023; USA Rice, "In Effort to Curb Inflation, Mexico Removes Duty on U.S. Rice Competitors," May 25, 2022.
Notes: 1. Rice shipments within the quota limit enacted in 2017 included paddy (1006.10.01), brown (1006.20.01), milled (1006.30.01, 1006.30.99), and broken rice (1006.40.01). 2. Under the new TRQs established in 2020, Mexico permits duty-free entry of 30,000 mt of rice from any origin until December 31, 2020, and another 75,000 mt from January 31, 2021, until December 31, 2021. 3. The rice imports affected by the 2022 decree were those under Mexican Tariff Schedule subheading 1006.10.99 for other paddy rice, while those included under the 2023 expansion of the decree were under the subheading 1006.30.99, which are classified as having a 3:1 or greater ratio between the length and width of the grain. This decree was extended on December 27, 2023, through the end of 2024. The tariff exemption on milled rice imports was removed by presidential decree on December 31, 2024, returning MFN tariffs to 20 percent. Government of Mexico, DOF, "DECRETO por el que se modifica el diverso [DECREE amending the various one]," December 31, 2024.

The United States supplied most of Mexico's milled rice imports before 2018 and during 2019–22; Uruguay was Mexico's largest source of milled rice imports in 2018 and 2023.[1420] Since 1991, Mexico's most-favored-nation (MFN) tariff, when in place, has been 20 percent for imported brown and milled rice

[1420] S&P Global, HS heading 1006, rice, accessed December 5, 2024.

from countries with which it does not have a free trade agreement.[1421] The import tariff on paddy rice is lower, at 9 percent.[1422] However, the Mexican government has made changes to these rates in response to market conditions, as described in the table below.

Enforcement of sanitary and phytosanitary standards protocols have also affected Mexico's import balance for both paddy and milled rice. The presence of fungus *phona sorghina* in Brazilian paddy fields in 2019 led to Mexico rejecting Brazilian paddy exports in that year.[1423] After this phytosanitary threat was resolved in 2020, Brazil expanded its share of paddy rice exports to Mexico. Also in 2019, the discovery of khapra beetles in a shipment of Uruguayan milled rice limited imports from September 2019 to April 2020.[1424] On November 24, 2020, Mexican phytosanitary authorities announced a long-term authorization for imports of Uruguayan rice into the country. Despite this authorization, milled rice imports from Uruguay did not significantly increase in 2021 and fell in 2022, perhaps because of strong domestic production in Mexico during MY 2020/21.[1425]

Because Mexican rice consumers are price sensitive, low-cost suppliers may be able to gain market share in Mexico in the future. For example, the United States may face increasing competition from Vietnam in the milled rice market segment. Vietnam and Mexico signed the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) in 2019, which continues to be phased in. Under the agreement, Mexico's tariff on milled rice imports from other CPTPP trading partners was lowered from 20 percent and is to become zero percent over 10 years, with a 2 percentage point tariff-rate decrease per year. Therefore, the duty on Vietnamese milled rice imported by Mexico under CPTPP decreased from 20 percent in 2018 to 10 percent in 2023 (year 5 of 10 of the tariff elimination phase-in).[1426]

Costa Rica

Although Costa Rica is not a large market for U.S. exports, it is a market where tariff preference erosion eroded U.S. competitiveness. Exports from Brazil displaced U.S. exports, which were diverted to other

[1421] UNCTAD, TRAINS database, Mexico MFN tariffs 1991–2023, accessed December 5, 2024. MFN rates for broken rice (HS 1006.40) were 10 percent from 1991 to 2008 and 20 percent from 2015 through 2023.
[1422] USDA, FAS, *Mexico Publishes Tariff Modifications on Basic Commodities*, May 30, 2008; Government of Mexico, DOF, "DECRETO Por El Que Se Expide La Ley de Los Impuestos Generales de Importación y de Exportación [DECREE Issuing the General Import and Export Tax Law]," July 1, 2020, 51.
[1423] USA Rice, "Mexico Opens Rice Market to Brazil," May 21, 2019.
[1424] Import shipments were permitted to resume in April 2020. USDA, FAS, *Grain and Feed Annual: Uruguay*, April 17, 2020, 9; USA Rice, "Mexico Drops Pest-Related Ban on Uruguayan Imports," May 6, 2020. About the same time, Mexico allowed milled rice imports from Brazil in 2019, lifting any sanitary and phytosanitary standards restrictions on the imports after Brazil granted its reciprocal approval of sanitary and phytosanitary standards requirements for beans from Mexico. Government of Brazil, Ministry of Foreign Affairs, "Apertura del mercado para exportaciones brasileñas de arroz procesado a México [Opening of the market for Brazilian exports of processed rice to Mexico]," November 5, 2019; Agencia Brasil, "Governo Comemora Abertura Do Mercado Mexicano Para o Arroz Brasileiro [Government Celebrates Opening of Mexican Market for Brazilian Rice]," May 24, 2019. Mexico's opening of the milled rice market to Brazil had little effect, however, as milled rice imports from Mexico's other major trading partners—the United States and Uruguay—already enjoyed duty-free access to the Mexican market
[1425] USDA, FAS, *Grain and Feed Update: Mexico*, January 14, 2021.
[1426] Paddy and brown rice under the agreement had a base rate of duty free, while the base tariff rate for broken rice was 10 percent with elimination on entry into force. CPTPP, Mexican Tariff Elimination Schedule (December 30, 2018), 16; CPTPP, General Notes of Annex 2-D Tariff Elimination of Mexico (December 30, 2018), 1; SICE, OAS, CPTPP, December 30, 2018.

Central American markets, explained in more detail in the next section. Costa Rica is also an important part of the Central American region, which (combined) is nearly as large an export market for U.S. rice as Mexico, as shown in figure 9.1.

Costa Rica's rice consumption is stable and high for Central America, with per capita consumption of 45–48 kg per year.[1427] Although consumption is stable, Costa Rican consumers have shifted toward higher-quality rice. Reportedly, Costa Rican consumers increasingly prefer rice with a lower percentage of broken grains and fewer chalky grains.[1428] Some sources report that Costa Ricans also prefer the cooking characteristics of rice from South America, which is reportedly less sticky after cooking.[1429]

Costa Rica's rice production declined significantly in recent years. In 2022, Costa Rica's agricultural reform shifted the industry away from fixed prices for rice production and toward a market-based system. This, combined with poor weather starting in 2023, reduced rice production and introduced more competition from imports.[1430] As a result of these factors, domestic production of rice in Costa Rica fell by 40 percent in marketing year (MY) 2022/23 compared to MY 2021/22,[1431] which represents a decline in domestic production as a share of consumption from 41.7 percent to 27.8 percent.[1432]

U.S. rice exports to Costa Rica declined significantly during the reporting period, and rice from South America captured nearly all the market share the United States lost. During the reporting period, Brazil's rice exports to Costa Rica grew more than 200,000 mt, making it the largest rice supplier (table 9.14). Additionally, exports from Uruguay and Argentina increased by 33,640 mt and 1,420 mt, respectively, from 2018 to 2023. Over 99 percent of the increase in Brazilian rice exports to Costa Rica was in paddy rice. Paddy rice exports from Brazil to Costa Rica were almost nonexistent in 2018 and rose quickly during the period, with a 91,950 mt (or 73.2 percent) increase from 2022 to 2023 alone (table 9.15). From 2018 to 2023, exports of paddy rice from Uruguay to Costa Rica also increased by 48,380 mt, overtaking U.S. paddy rice exports in 2023.

Table 9.14 Costa Rica: total rice imports, by trade partner, 2018–23
In thousands of metric tons. ** = rounds to 0 (less than 500 metric tons).

Trade partner	2018	2019	2020	2021	2022	2023
Brazil	1	15	120	76	126	218
Uruguay	24	36	23	9	45	58
Argentina	11	58	5	6	9	13
United States	72	81	67	77	33	11
Paraguay	7	10	13	5	1	8
All other	**	2	1	7	1	**
Total	116	202	228	179	214	307

Source: S&P Global, General imports, HS heading 1006, rice, accessed August 5, 2024.

1427 USDA, FAS, *CORRECTED Costa Rica Rice Situation Update*, August 30, 2023, 5.
1428 USDA, FAS, *CORRECTED Costa Rica Rice Situation Update*, August 30, 2023, 6.
1429 USDA, FAS, *CORRECTED Costa Rica Rice Situation Update*, August 30, 2023, 5–6; Fitchette, "Rice Quality at Heart of U.S. Market Share Woes in Latin America," January 3, 2024.
1430 USDA, FAS, *CORRECTED Costa Rica Rice Situation Update*, August 30, 2023, 4–5.
1431 USDA, FAS, *CORRECTED Costa Rica Rice Situation Update*, August 30, 2023, 2.
1432 USDA, FAS, PSD Online database, accessed November 4, 2024.

Table 9.15 Costa Rica: paddy rice imports, by trade partner, 2018–23
In thousands of metric tons. ** = rounds to 0 (less than 500 metric tons).

Trade partner	2018	2019	2020	2021	2022	2023
Brazil	**	15	120	76	126	218
Uruguay	**	16	0	0	26	49
United States	65	75	65	73	31	10
All others	0	43	**	3	**	0
Total	65	148	185	152	183	276

Source: S&P Global, GTAS database, General imports, HS subheading 1006.10, rice in the husk (paddy or rough), accessed August 5, 2024.

Historically, U.S. rice exports have benefited from duty-free access to the Costa Rican market under CAFTA-DR. When CAFTA-DR was fully implemented in 2009, the United States was afforded increasing market access in Costa Rica and other signatory countries under a gradual tariff phase-out regime. Effective in 2025, the United States has tariff-free, quota-free access to the Costa Rican rice import market.[1433]

In 2022, the United States lost its tariff preference advantage for rice vis-à-vis certain other global suppliers. That year, in response to high consumer prices, the Costa Rican government by executive order reduced its 35 percent duty on rice to 4 percent for milled rice and 3.5 percent for paddy rice.[1434] This lowered tariff allowed Brazilian and Uruguayan exporters to compete on a price basis with the United States.[1435] As a result, imports from Brazil and Uruguay surged between 2022 and 2023. However, following a complaint from local rice producers, in April 2024, a Costa Rican administrative court suspended the August 2022 tariff reduction.[1436] The ruling reinstated the 35 percent tariff rate until June 2024, when a Costa Rican court overturned the earlier court's ruling, reinstating the tariff on non-U.S.-origin rice back to its reduced rate.[1437]

As the United States' tariff preferences have eroded as a result of Costa Rica's 2022 executive order, so too has U.S. rice competitiveness. Previously, the United States was able to offer significantly cheaper rice to Costa Rica, but the removal of tariff barriers has allowed for Brazilian and Uruguayan producers to gain a foothold in the Costa Rican market. Reportedly, Costa Ricans prefer rice from Brazil and Uruguay.[1438] If the tariff rate set in 2022 were to remain, the U.S. rice industry may continue to lose its market share. The Costa Rican domestic rice industry may also continue to struggle to compete against imported rice.

Other Central American Markets

Rice consumption in Central America is modest, but the area is an important market for U.S. exports of paddy rice. Although corn is the traditional starch of choice in Central America, Panama and Nicaragua,

[1433] USDA, FAS, *Tariff Snapback Boosts Demand for US Rice*, April 16, 2024, 2.
[1434] USDA, FAS, *Tariff Snapback Boosts Demand for US Rice*, April 16, 2024, 2; Costa Rica, "Modification of Tariff Duties on the Import of Paddy and Milled Rice," August 3, 2022.
[1435] USDA, FAS, *Tariff Snapback Boosts Demand for US Rice*, April 16, 2024, 2.
[1436] Costa Rica, "Modification of Tariff Duties on the Import of Paddy and Milled Rice," August 3, 2022.
[1437] USDA, FAS, *Costa Rica Slashes Rice Tariffs Again*, June 12, 2024; USDA, FAS, *Tariff Snapback Boosts Demand for US Rice*, April 16, 2024, 1; Costa Rica, "Modification of Tariff Duties on the Import of Paddy and Milled Rice," August 3, 2022, 43.
[1438] USDA, FAS, *CORRECTED Costa Rica Rice Situation Update*, August 30, 2023, 2.

like Costa Rica, are notable rice consumers.[1439] In Central America, imports satisfy a significant share of domestic consumption, with domestic production fulfilling between 40 and 70 percent of domestic demand across the region's largest rice consumers.[1440] Brazil, the United States, and Uruguay supply most of the region's rice imports.[1441]

After Costa Rica issued its 2022 executive order lowering its tariff on rice, U.S. rice exporters shipped rice to other Central American countries—primarily Honduras—to offset the loss of the Costa Rican market.[1442] Between 2021 and 2023, as U.S. exports to Costa Rica fell by more than 67,000 mt, exports to Honduras grew by nearly 48,000 mt and exports to Panama increased by more than 26,000 mt (table 9.16).

Table 9.16 United States: total rice exports to Central America, by trade partner, 2018–23
In thousands of metric tons. ** = rounds to 0 (less than 500 metric tons).

Trade partner	2018	2019	2020	2021	2022	2023
Honduras	196	161	124	163	131	210
Nicaragua	11	132	92	110	115	116
Guatemala	123	117	84	121	114	85
Panama	24	51	24	32	66	58
El Salvador	79	78	75	86	31	49
Costa Rica	74	76	54	77	24	10
Belize	1	**	**	**	**	1
Total	507	616	454	590	480	528

Source: S&P Global, Total exports, HS heading 1006, rice, accessed August 5, 2024.

Table 9.17 United States: total rice exports to Central America, by trade partner and value, 2018–23
In millions of dollars. ** = rounds to 0 (less than 500 million dollars).

Trade partner	2018	2019	2020	2021	2022	2023
Honduras	61	47	46	53	45	87
Nicaragua	5	44	33	44	50	51
Guatemala	38	35	28	40	42	34
Panama	10	18	11	13	28	25
El Salvador	24	23	24	28	12	19
Costa Rica	25	23	18	25	8	5
Belize	1	**	**	1	**	1
Total	165	188	160	203	185	221

Source: S&P Global, Total exports, HS heading 1006, rice, accessed August 5, 2024.

As in Costa Rica, U.S. rice competitiveness throughout the region relies on preferential market access. Effective in 2023 under CAFTA-DR, the U.S. rice industry gained duty-free, quota-free access to most of the region.[1443] This presents an opportunity for the United States to increase its exports to Central America. However, future market access agreements between South American rice exporters and

[1439] USA Rice, "Central America," accessed September 26, 2024.
[1440] Domestic production fluctuates because of the region's reliance on rainfed production. USDA, FAS, "Panama, Costa Rica, and Nicaragua Rice Production," September 29, 2017; ITA, "Honduras Country Commercial Guide," January 25, 2024; USDA, FAS, "Panama, Costa Rica, and Nicaragua Rice Production," September 29, 2017.
[1441] S&P Global, HS heading 1006, rice, accessed December 5, 2024.
[1442] U.S. government official, interview by USITC staff, August 22, 2023.
[1443] USDA, FAS, *Exporter Guide*, December 9, 2022; USDA, FAS, *Exporter Guide*, January 5, 2023.

Central American countries may reduce the competitiveness of U.S. rice vis-à-vis South American paddy rice exporters like Brazil.

Other Western Hemisphere Markets

After Mexico, the largest markets in North America for U.S. rice are Haiti and Canada. U.S. exporters face challenges in both markets. In Haiti, a long grain rice market, the key challenges are eroding advantages for U.S. producers related to cost and logistics. In Canada, which is a market for virtually all varieties of U.S. rice, the primary challenge is from the increasing popularity of aromatic rice varieties, which are the only types of rice the United States does not competitively produce.

Haiti

In Haiti, the largest U.S. long grain export market, U.S. competitiveness declined somewhat during 2018–23 because internal strife created a challenging business environment. The decline was exacerbated by increasing competition from lower-cost suppliers, particularly Pakistan. In 2018, the U.S. market share of Haiti's rice imports was 88 percent; that share fell to 71 percent in 2023, mostly because of the increased presence of Pakistani rice in the Haitian market.

Some of the decline in U.S. exports to Haiti can be explained by factors that likely affected all suppliers in that market. During 2018–23, shipping U.S. rice to Haiti's capital, Port-au-Prince, and surrounding areas became increasingly challenging because of social and political instability.[1444] This instability resulted in widespread food insecurity in the country as port authorities at the International Port of Port-au-Prince advised exporters to postpone shipments because of security problems. However, shipments were redirected to the Port of Cap-Haitien in the north, which reportedly maintained uninterrupted operations.[1445] In addition, Haiti's domestic production of rice declined over the period, with farmers abandoning some of the most productive rice-growing land because of the political insecurity.[1446] This led to an uptick in demand for imported rice from all sources.

Pakistan seems to have experienced fewer problems than the United States in exporting rice to Haiti in 2023. Despite shipping very little rice to Haiti prior to 2023, Pakistan contributed about 23 percent of Haiti's imports that year (table 9.18). According to industry and U.S. government sources, the increase was due to a combination of Pakistan's logistics advantages and price. Two industry sources reported that trucking rice from Cap-Haitien to Port-au-Prince was nearly impossible because of security risks.[1447] The logistics advantage for Pakistani rice may have been created because the goods arrived in bags and, according to a U.S. government report, could be more easily offloaded and transported by small boats between Haitian cities.[1448] Supreme Rice, a major U.S. exporter to Haiti, had traditionally shipped in bulk and bagged its rice upon arrival in Haiti; however, the firm lost Haitian employees at its bagging facility because of threats of violence and because of migration to the United States.[1449]

[1444] USDA, FAS, *Grain and Feed Annual: Haiti*, April 17, 2024.
[1445] USDA, FAS, *Grain and Feed Annual: Haiti*, April 17, 2024.
[1446] USDA, FAS, *Grain and Feed Annual: Haiti*, April 17, 2024.
[1447] Industry representative, interview by USITC staff, August 26–28, 2024; industry representative, interview by USITC staff, July–August 2024.
[1448] USDA, FAS, *Grain and Feed Annual: Haiti*, April 17, 2024.
[1449] Tomson, "Conditions Deteriorate for US Rice," August 3, 2023.

Table 9.18 Haiti: total rice imports, by trade partner and volume 2018–23

In thousands of metric tons. ** = rounds to 0 (less than 500 metric tons).

Trade partner	2018	2019	2020	2021	2022	2023
United States	412	450	461	406	384	375
Pakistan	1	9	32	6	0	122
India	1	1	6	11	1	14
Taiwan	7	10	10	12	9	9
Guyana	22	2	9	3	4	6
Uruguay	**	1	18	0	14	0
All others	27	26	13	4	**	0
Total	470	497	550	441	413	527

Source: S&P Global, Total exports, HS heading 1006, rice, accessed December 9, 2024.

U.S. price competitiveness, the second key challenge in Haiti, eroded between 2021 and 2023. Throughout 2021 and 2022, Haiti's currency depreciated about 140 percent against the U.S. dollar (though its value recovered slightly beginning in 2023).[1450] This reportedly made it difficult for rice importers to access the U.S. dollars needed to finance their transactions, and Haitian government efforts to provide funding were not large enough to be effective given the size of typical rice purchases from the United States.[1451] Although low Haitian domestic production in these years kept demand for U.S. rice fairly steady, Haiti's overall rice imports declined during the period of exchange rate volatility, and U.S. exports likely would have been higher if not for this factor.[1452] In years when U.S. rice became relatively expensive, Haitian importers sought other sources of imports, including not only Pakistan, but also Guyana and Uruguay in some years. Guyana and Uruguay are less reliable exporters to Haiti but in some cases may have offered price advantages.

Canada

Canada is a large market for many types of U.S. rice, with trade and consumption data showing that its demand characteristics are similar to those of the United States, although unlike the United States, it has no domestic production.[1453] Canadians consume a variety of different types of rice, including both long- and medium- grain white rice, as well as parboiled rice and broken rice for feed and ingredient uses (as shown in figure 9.1). Much like in the United States, aromatic rice appears to be increasingly popular with Canadian consumers. Imports from India, Thailand, and Pakistan rose quickly between 2018 and 2023, most of which were likely aromatic rice.[1454] Imports from Vietnam also rose quickly, and at least some of these imports from Vietnam were of aromatic rice because Vietnam reported that Canada was a target market for its high-quality, aromatic ST25 variety.[1455] As a result, the U.S. share of the Canadian rice import market fell from 57 percent in 2018 to 31 percent in 2023 (table 9.19). Meanwhile, India's share grew from 13 percent to 25 percent and Pakistan's share grew from 2 percent to 5 percent. Thailand's share fell slightly, from 22 percent to 21 percent, but reached a high of 28 percent in 2022.

[1450] USDOC, ITA, "Haiti," May 27, 2024.
[1451] USDA, FAS, *Grain and Feed Annual: Haiti*, April 14, 2023.
[1452] USDA, FAS, *Grain and Feed Annual: Haiti*, April 14, 2023.
[1453] USA Rice, "Canada Marketing Representation," accessed December 26, 2024.
[1454] Evans, "India's Rice Export Ban Leads to Stockpiling," July 25, 2023.
[1455] WTO Center, "Vietnam's Premium Rice," September 19, 2024.

Table 9.19 Canada: total rice imports, by trade partner and volume 2018–23
In thousands of metric tons. ** = rounds to 0 (less than 500 metric tons).

Trade partner	2018	2019	2020	2021	2022	2023
United States	227	244	237	231	245	238
India	54	65	86	62	88	196
Thailand	89	96	112	85	148	161
Vietnam	8	13	14	9	14	68
Pakistan	10	11	15	12	17	38
Türkiye	**	**	**	**	**	10
Japan	**	**	**	**	1	10
China	2	3	2	2	2	9
Sri Lanka	1	1	1	1	1	8
Taiwan	**	1	2	1	1	5
All others	8	11	15	11	16	30
Total	400	446	483	415	532	773

Source: S&P Global, General imports, HS heading 1006, rice, accessed December 9, 2024.

Because Canada is one of the few markets that import a variety of different rice types, it is an important and reliable market for U.S. exporters of all rice varieties and product forms. Although U.S. producers have logistics and cost advantages that stem from their proximity to the Canadian market, during the period consumers in Canada increasingly shifted away from some U.S. exports and toward aromatic rice. The U.S. industry considers the growth in popularity of aromatic rice to be a market constraint and the primary threat to U.S. market share.[1456] Further reflecting demand for high-quality, specialty rice varieties, Canada's imports of rice from Japan also grew very rapidly, from a thousand mt or less in every year prior to 2023 to nearly 10,000 mt in 2023. Though this increase was from a very small base, it likely reflects the same Japanese effort to expand exports of premium short grain rice described in the U.S. market section of this chapter.

East Asia

In East Asia, Japan and South Korea are the largest markets for U.S. rice, and exports are primarily of California-grown medium grain rice. From 2018 to 2023, Japan remained the top U.S. medium grain rice export destination. All of the major markets for U.S. medium grain rice in East Asia (South Korea, Japan, and Taiwan) administer TRQ regimes to regulate rice imports and protect domestic production. The United States has a country-specific quota (CSQ) in South Korea and Taiwan, which assures access to these markets.[1457] In general, U.S. competitiveness in East Asia hinges on compliance with import regulations and an understanding of often-complex import regimes, as described below.

Japan

Japan is the largest export market for California producers; they sell medium grain rice to Japan under its complex import regime. Japanese rice production and imports are primarily of short and medium grain rice, also known as japonica rice. Rice production is of critical importance to Japanese policymakers, and decisions about the import market have historically been made with the benefit to domestic producers

[1456] USA Rice, "Market Fact Sheet: Canada," January 2020.
[1457] Pub. L. No. 89-497, para. 1; USDA FAS, *Grain and Feed Update: South Korea*, January 31, 2024, 6–9.

in mind.[1458] Accordingly, Japanese rice policy draws a distinction between “table rice,” which is sold to consumers for household cooking, and rice for processing into feed and processed rice products. Under the Japanese system, the domestic industry supplies consumers with white short and medium grain table rice, and imports are used mostly in processing. The import restrictions described below keep most imported rice out of the higher value table rice market, protecting the Japanese table rice industry from price competition from imports.

Japan has been experiencing a long-term decline in rice consumption and production, consistent with overall population declines. Rice remains a staple food for Japanese consumers, but consumption has been declining since the 1960s because of the increased popularity of alternative foods, including bread and noodles.[1459] In addition, Japan’s population has been declining since 2008; as of 2023, over one-third of Japan’s population was over the age of 65.[1460]

As consumption has declined, production has also slowed. Aging farmers operating on small-scale rice farms are increasingly exiting the industry, contributing to this decline in rice production.[1461] Japan’s Ministry of Agriculture, Forestry and Fisheries (MAFF) estimated that the number of rice farmers declined by 25 percent from 2015 to 2020, and the average age of Japanese farmers is 68 years old.[1462] At the same time, Japanese rice producers have been encouraged by MAFF to look into shifting from growing rice to corn and wheat.[1463] Although Japan produces enough table rice to supply Japanese consumption in most years, domestic rice production is expected to continue to decline.[1464]

Meeting domestic consumption needs is difficult for Japanese producers in low crop years, particularly 2023, which was the worst harvest in many years.[1465] Record-high temperatures and low precipitation levels contributed to production declines and affected quality in 2023; chalky and split grains led to poor milling yields. Japanese rice production declined by 2.4 percent from MY 2022/23 to MY 2023/24, and area harvested declined by 2 percent during the same period.[1466] As a result, rice prices rose to record levels in Japan and stocks declined.[1467] These conditions led to a higher share of imported table rice entering the Japanese market to fill consumer demand.[1468]

Japan carefully manages import levels, and most imports are used for processing, even in poor crop years. Japan is the top market for U.S. white medium grain rice, but U.S. exports fell by 78,700 mt from

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[1458] Fukuda, Dyck, and Stout, “Rice Sector Policies in Japan,” March 2003.
[1459] Yoshikawa, “Revitalising Japan’s Rice Industry Means Targeting Export Markets,” December 20, 2022.
[1460] Yokoyama, “Japan’s Population Falls at Record Rate,” July 25, 2024; Edmond and North, “More than 1 in 10 People in Japan Are Aged 80 or Over,” September 28, 2023, 13.
[1461] Rice grown in Japan is almost all japonica short grain rice; USDA FAS, *Grain and Feed Annual: Japan*, March 20, 2024, 13.
[1462] USDA, FAS, *Grain and Feed Annual: Japan*, March 20, 2024; Government of Japan, “Crop Status Survey,” accessed August 26, 2024.
[1463] Domestically produced Japanese grain corn is often processed into feed, drinks, and snacks. USDA, FAS, *Grain and Feed Update: Japan*, October 2, 2023.
[1464] USDA, FAS, *Grain and Feed Annual: Japan*, March 20, 2024; Yoshikawa, “Revitalising Japan’s Rice Industry Means Targeting Export Markets,” December 20, 2022.
[1465] USDA, FAS, PSD Online database, accessed November 4, 2024.
[1466] USDA, FAS, *Grain and Feed Annual: Japan*, March 20, 2024.
[1467] Terukina, “Rice Inflation to Persist,” September 24, 2024.
[1468] USDA, FAS, *Grain and Feed Annual: Japan*, March 20, 2024; Lewis, “Japan Faces Worst Rice Shortage in Decades,” September 6, 2024.

2018 to 2023 largely because of the drought in California that affected U.S. exports at the end of the period. In 2023, as California producers were recovering from the drought, Thailand surpassed the United States as the largest rice exporter to Japan, increasing its long grain rice exports by 86,420 mt from 2022 to 2023 (table 9.20).[1469] Although long grain rice is not directly substitutable with medium grain rice for all uses in processing, Japan has demand for both forms of rice from its processing sector.[1470]

Table 9.20 Japan: rice imports, by trade partner and type, 2018–23
In thousands of metric tons. ** = rounds to 0 (less than 500 metric tons).

Trade partner	Rice Type	2018	2019	2020	2021	2022	2023
Thailand	Long grain rice	245	263	269	270	282	368
United States	Medium grain rice	288	325	297	304	289	209
China	Medium grain rice	61	49	74	61	61	72
Australia	Medium grain rice	52	12	1	**	24	49
All other	All other rice types	1	3	8	6	6	4
Total	All types	647	652	649	641	661	703

Source: S&P Global, General imports, HS subheading 1006.30, semi-milled or wholly milled rice, whether or not polished or glazed, accessed August 2024.
Note: "All other markets" includes rice types not listed from Australia, China, Thailand, and the United States as well as markets not listed.

Tariff-Rate-Quota System

Japan manages import levels through a complex TRQ regime. To fill its annual TRQ, the Japanese government imports in-quota rice (and rice products) each year duty free. Total in-quota imports are 682,000 mt (on a milled rice basis).[1471] Of this total, Japan imports a maximum of 100,000 mt of rice through what are known as simultaneous buy and sell (SBS) tenders. These tenders are for the higher valued table rice market, and they are Japan's only rice imports intended for direct human consumption.[1472] This limited volume of SBS rice (i.e., table rice) is typically imported from China, the United States, Australia, and Thailand.[1473] However, when the price of rice in Japan is low, SBS tenders may not reach 100,000 mt, as purchasers choose to buy domestic rice over imported rice.[1474] As of 2023, SBS tenders have not been 100 percent filled since 2017, though demand for imported rice was expected to increase in 2024.[1475]

The remainder of Japan's rice imports within the TRQ limit are purchased through the Ordinary Market Access (OMA) system, and these imports are sold to domestic processors. Japan's domestic industries

[1469] Thailand primarily exports a type of long grain white rice called 100 percent Grade B to Japan.
[1470] Industry representative, interview by USITC staff, November 21, 2024.
[1471] Japan's TRQ was established under the WTO and is also referred to as Minimum Access rice.
[1472] USDA FAS, *Competitive Changes Expected in Japanese Rice Market*, July 3, 2018.
[1473] USDA FAS, *Grain and Feed Annual: Japan*, March 31, 2023.
[1474] USDA FAS, *Competitive Changes Expected in Japanese Rice Market*, July 3, 2018.
[1475] When SBS tenders are not filled to 100,000 mt, the remaining tenders are converted to the Ordinary Market Access system. USDA FAS, *Grain and Feed Annual: Japan*, March 20, 2024.

process this rice into feed and processed rice products, or donate it as food aid.[1476] The Japanese rice processing industry is further protected by an in-quota duty on imports of processed rice products such as rice flour and doughs.[1477] Duties on out-of-quota imports of all types of rice and rice products are very high, at either 341 yen/kg ($2.23/kg) or 375 yen/kg ($2.46/kg) depending on the rice type, which sharply limits such imports.

Although there are no import duties on in-quota rice imports, MAFF collects a markup on SBS rice. This markup reflects the difference between the sales price of rice to MAFF and the purchase price of rice from MAFF—hence the name "simultaneous buy and sell"—with the difference becoming government revenue. According to USDA FAS, those wishing to compete for SBS tenders submit a bid that includes both "a sales price to MAFF" and "a purchase price from MAFF of the origin and type of rice of their choice. MAFF then awards imports to offers with the largest markup (i.e., the difference between the two prices) until the tender volume is filled."[1478] The markup is set at an estimated minimum of 61 yen (or $0.40) per kg for whole grain rice, a minimum level that has not changed since 2018.[1479] Although the Japanese government sets a minimum markup, the actual markup is decided through the bidding process and can be higher.[1480] The markup process serves to limit the supply of rice entering the Japanese market from foreign producers and keep domestically produced rice competitive.[1481]

Competition in the Japanese Market

The United States has a strong business relationship with Japanese rice importers and remains the country's most reliable supplier, though competition from other exporting countries is increasing slightly. Between 2018 and 2023, the United States supplied an average of 44 percent of Japan's rice imports, far more than any other single supplier except Thailand.[1482] U.S. competition with other major rice suppliers in the Japanese market is somewhat limited because other suppliers either do not offer the same product attributes as the United States or are not able to supply a comparable volume of rice. Competition is more pronounced in the SBS market than the OMA market, as described below.

In the OMA market (rice for processing), U.S. rice exported to Japan is an undifferentiated product with limited ability to distinguish itself from other import suppliers. Rice products, including rice flour and cakes, can be produced using a variety of rice types including white short grain, medium grain, and long grain rice, which can be sourced from a variety of trading partners. As such, the United States competes for OMA tenders with various rice types from Australia, China, and Thailand, as shown in table 9.20. Rice from Thailand is mostly long grain rice and is used in a specific type of noodle; medium grain rice from the United States, Australia, and China is used mostly to produce rice flour.[1483] The difference in rice types limits direct competition between the United States and Thailand.

[1476] USDA FAS, *Grain and Feed Update: Japan*, October 2, 2023.
[1477] In contrast, the in-quota tariff on whole rice is zero plus the markup described below. USDA FAS, *Competitive Changes Expected in Japanese Rice Market*, July 3, 2018.
[1478] USDA, FAS, *Competitive Changes Expected in Japanese Rice Market*, July 3, 2018.
[1479] USDA, FAS, *Grain and Feed Update: Japan*, October 2, 2023; USTR, *National Trade Estimate Report 2024 on Foreign Trade Barriers*, accessed April 12, 2024, 222.
[1480] Industry representative, interview by USITC staff, September 20, 2024.
[1481] Industry representative, interview by USITC staff, September 20, 2024.
[1482] S&P Global, HS heading 1006, rice, accessed June 17, 2024
[1483] Industry representative, interview by USITC staff, November 21, 2024.

According to an industry source who has exported SBS (table) rice to Japan, competition between exporters for the limited volume of SBS rice is more pronounced. This source reports that the United States' biggest competitor in the SBS market is Australia.[1484] Australia does not supply large quantities of rice to the Japanese market, but it has two key advantages in the SBS market in particular. First, Australia receives a CSQ under the CPTPP, and this CSQ is reportedly filled with SBS rice. Australia's new CSQ under the CPTPP was established at 6,000 mt in 2018 and increases until it reaches a maximum of 8,400 mt in 2030. Second, under a side agreement, Australia pays a discounted markup on SBS rice. Since 2020, the estimated markup has been 51 yen (or $0.3) per kg for rice from Australia.[1485] Multiple industry sources report that China is not a strong competitor in the SBS rice market, where consumers know the origin of their rice, because Japanese consumers distrust the safety of Chinese food products.[1486]

An additional competitive challenge in Japan, particularly for SBS rice, is that the markup process is considered nontransparent by U.S. rice exporters.[1487] According to an industry source, the 61 yen per kg markup is theoretically variable based on market conditions (such as changes in transportation costs), but in reality, the Japanese government does not disclose the criteria used for its decisions and will raise the minimum markup but will never lower it below the 61 yen per kg floor.[1488] The U.S. industry believes it would be more competitive in Japan if the markup process were more transparent and if the share of the total TRQ volume allocated to SBS rice were raised in light of the projected declines in Japanese domestic production.[1489]

South Korea

Though consumption of rice is declining, much like in Japan, South Korea remains an important market for U.S. rice. Demand for brown medium grain rice is particularly strong, as it is common in the Korean market to mix white and brown medium grain rice together to create a blend with better taste and texture according to local preferences.[1490] South Korea's per capita rice consumption was a record low 56.4 kg in 2023. Korean consumer preferences are shifting toward ready-to-eat products over traditional table rice, in part because households have become smaller on average.[1491] Increasing demand for wheat has also contributed to the declining consumption of table rice.[1492]

The popularity of processed rice food products has somewhat offset declining table rice consumption in South Korea.[1493] Rice for use in distilled liquor and alcohol showed the largest growth. Consumption of

[1484] Industry representative, interview by USITC staff, November 21, 2024.
[1485] In 2023, the Australian CSQ filled at 6,720 mt. USDA FAS, *Grain and Feed Update: Japan*, October 2, 2023.
[1486] Industry representative, interview by USITC staff, November 21, 2024; USA Rice, "Japan Marketing Representation," November 30, 2022.
[1487] USA Rice, "Comments Regarding Foreign Trade Barriers to U.S. Exports for 2025 Reporting," October 11, 2024, 19; USTR, *National Trade Estimate Report 2024 on Foreign Trade Barriers*, accessed April 12, 2024, 222.
[1488] Industry representative, interview by USITC staff, November 21, 2024.
[1489] Industry representative, interview by USITC staff, November 21, 2024; USA Rice, "Japan Marketing Representation," November 30, 2022.
[1490] Ford, "All About Korean Rice," September 19, 2024.
[1491] USDA, FAS, *Grain and Feed Annual: South Korea*, April 10, 2024, 4.
[1492] USDA, FAS, *Grain and Feed Annual: South Korea*, April 10, 2024, 4.
[1493] USDA, FAS, *Grain and Feed Update: South Korea*, July 3, 2024, 4.

rice among packaged food, chewy cakes, feed, and processed grain products manufacturers also increased during the reporting period.[1494]

Most of the table rice consumed in South Korea is produced domestically. Production remained relatively stable during the reporting period, fluctuating between 3.5 million mt and 3.9 million mt.[1495] As table rice demand and consumption trend downward, the South Korean government has established subsidies for rice acreage reduction and works to maintain a target price of 200,000 Korean won per 80 kg of milled rice.[1496] Government subsidies are also available to assist in the transition from rice to flour, corn, and bean production.[1497] South Korea also maintains a stock of rice used for food aid, processing, and feed.[1498]

Total South Korean rice imports fell between 2018 and 2023 (table 9.21), but this was mostly due to data anomalies related to TRQ administration. South Korea purchases rice under its TRQ system on a calendar-year basis, and shipments may arrive in the next calendar year if tenders are awarded at the end of the year. China was the leading exporter of rice to South Korea in every year during the period except 2019, when the United States was the top exporter.

Table 9.21 South Korea: total rice imports, by trade partner, 2018—23

In thousands of metric tons. ** = rounds to 0 (less than 500 metric tons).

Trade partner	2018	2019	2020	2021	2022	2023
China	160	157	206	201	233	111
Vietnam	138	8	123	64	76	69
Thailand	20	**	32	31	54	43
United States	97	163	166	167	94	42
All other	10	**	0	30	27	17
Total	425	328	526	493	483	282

Source: S&P Global, General imports, HS subheading 1006.30, semi-milled or wholly milled rice, whether or not polished or glazed, accessed August 2024.

Note: CSQ fill rates and South Korean import data may not line up due to the differences between contract processing times and fulfillment.

In accordance with its WTO commitments, South Korea imports 408,700 mt of rice (on a milled basis) annually. Under South Korea's TRQ regime, which was implemented in 2015, these imports are assessed a 5 percent duty.[1499] Over-quota rice imports are subject to a 513 percent duty.[1500] Medium grain brown rice is the top imported rice type, with brown rice typically making up about 90 percent of South Korea's imports.[1501] As of January 1, 2020, certain rice exporters to South Korea, including the United States,

[1494] USDA, FAS, *Grain and Feed Annual: South Korea*, April 10, 2024.

[1495] USDA, FAS, "PSD Online," accessed November 4, 2024.

[1496] The South Korean government stabilizes rice prices through government purchases and releasing government stocks of rice. USDA, FAS, *Grain and Feed Annual: South Korea*, April 10, 2024, 4.

[1497] The subsidies include corn for food (1 million won/ha), all types of beans (including soybeans) (1 million won/ha), and rice for production into rice flour (2 million won/ha). In January 2024, 1 million won was equal to $769 in January 2024. USDA, FAS, *Grain and Feed Update: South Korea*, January 31, 2024, 4.

[1498] USDA, FAS, *Grain and Feed Annual: South Korea*, April 10, 2024.

[1499] Set up as a special case in 1995 at the WTO's Uruguay Round Agreement, South Korea's special treatment permissions expired in 2014, and South Korea switched to a TRQ regime with a 513 percent tariff rate for out-of-quota imports. USTR, "United States and South Korea Reach Agreement," November 19, 2019.

[1500] USTR, "United States and South Korea Reach Agreement," November 19, 2019.

[1501] S&P Global, HS heading 1006, rice, accessed June 17, 2024.

were allocated CSQs totaling 388,700 mt (table 9.22).[1502] The remaining 20,000 mt under the TRQ are allocated on a global basis and are also available to countries with CSQs.[1503] Additionally, if countries do not fill their CSQs, the available tenders are allocated to the global market.[1504] U.S. rice exports to South Korea have remained steady with the exception of 2022, when the United States was unable to fill its CSQ because of drought conditions in California impacting the state's rice output.[1505] However, South Korea completed allocating 2023 CSQs in December, and the United States had a 100 percent fill rate for that year (after accounting for the delayed shipments previously mentioned), indicating that exports recovered quickly.[1506]

Table 9.22 South Korea: country-specific quotas
In thousands of metric tons (mt) and percentages (%).

Trade partner	CSQ Allocation (mt)	2020 Fill Rate (%)	2021 Fill Rate (%)	2022 Fill Rate (%)	2023 Fill Rate (%)
Australia	15,595	0.0	100.0	100.0	100.0
China	157,195	109.9	100.0	100.0	100.0
Thailand	28,494	100.0	200.0	135.4	152.6
United States	132,304	100.0	100.0	27.3	100.0
Vietnam	55,112	100.0	100.0	118.0	109.1

Source: Pub. L. No. 89-497, para. 1; USDA, FAS, *Grain and Feed Update: South Korea*, January 31, 2024.
Notes: CSQ fill rates and South Korean import data may not line up because of the differences between contract processing times and fulfillment.

U.S. competitiveness in South Korea is stable due to CSQs and U.S. product differentiation. The United States has the second-largest CSQ, behind China, which allows the United States significant access to the South Korean market compared to other major exporters. With out-of-quota tariffs of 513 percent, imports outside of CSQ allotments are unable to compete against both domestically produced rice and in-quota imports. The exception to this is exports from Thailand; between 2018 and 2023, Thailand consistently exceeded its CSQ. However, nearly all of Thailand's rice exports to South Korea are of cargo rice, a premium, specialty rice cultivated in Thailand and popular in South Korean cuisine.[1507] This suggests that Thailand's unique product offerings enable Thailand's exports to remain competitive, even at a 513 percent duty.

U.S. rice exports to South Korea benefit from a reputation in the market as a reliable supplier of both brown and white medium grain rice that meets the Korean market's high standards. South Korea is the second largest destination for U.S. medium grain exports, of which about three-fourths were brown rice

[1502] USTR, "United States and South Korea Reach Agreement," November 19, 2019.
[1503] USTR, "United States and South Korea Reach Agreement," November 19, 2019.
[1504] USDOS, "Agreement Between the Governments of Australia, the People's Republic of China, the Republic of Korea, the Kingdom of Thailand, the United States of America, and the Socialist Republic of Viet Nam," December 30, 2019.
[1505] For more information on water shortages impacting California rice crops, see chapter 4. USDA FAS, *Grain and Feed Annual: South Korea*, April 10, 2024.
[1506] Industry representative, interview by USITC staff, August 26–28, 2024.
[1507] Red cargo rice is a rice variety grown in Thailand where the husk is removed but the bran is retained during the milling. This unpolished rice has a red hue and is popular in certain Korean dishes like *japgokbap.* By volume and value, more than 90 percent of Thailand's rice exports to South Korea are of cargo rice. Rice News Today, "What Is Red Cargo Rice?," August 26, 2023; ImportFood, "Thai Rice, Red Cargo, 5 Lb," accessed December 26, 2024; S&P Global, HS heading 1006, rice, accessed June 17, 2024.

and one-fourth were white rice in 2023.[1508] Although brown rice makes up the larger share of the Korean market, South Korea is the second-largest U.S. export destination for medium grain white rice, and 80 to 90 percent of South Korea's medium grain white rice imports were from the United States during 2018–23.[1509] California rice exporters reportedly prioritize the South Korean market during periods of short supply because it offers higher prices than other markets.[1510] For example, during the 2022 drought in California, producers sent a higher share to South Korea because it offered the best returns to farmers for their product. Part of the reason that the South Korean market offers high prices is because it reportedly has stringent product specifications that ensure all the rice in the market is of high quality.[1511] For example, South Korea imposes strict maximum residue limits that are easier for California producers to meet than some other suppliers.[1512]

Taiwan

Although Taiwan's rice industry supplies most of its domestic consumption, it is a top U.S. medium and long grain rice export destination. Taiwan consumes a variety of rice types, although medium grain rice is most widely consumed.[1513] As has occurred in other East Asian markets, rice consumption is falling in Taiwan as the country's population ages and consumers diversify their diets.[1514] Despite rice consumption trending downward, rice production has remained relatively stable, in part due to government policies that encourage rice production.[1515] As a result, rice stocks are growing. There have been efforts to shed old-crop rice from reserves, including through selling rice as animal feed, exporting to lower-income markets like Papua New Guinea and the Solomon Islands, and donating rice as food aid to Haiti.[1516]

Like South Korea and Japan, Taiwan imports rice under TRQs. Due to this TRQ regime, Taiwan's imports are relatively stable and account for approximately ten percent of domestic consumption.[1517] Taiwan's TRQ allows for 144,720 mt of rice imports (on a brown rice basis) annually. The quota for private sector imports is approximately one-third of this overall quota, while the public sector imports the remaining two-thirds of this quota.[1518] Taiwan has CSQ allotments within this quota, of which the United States has the largest share, at approximately 45 percent of the overall TRQ. Australia has the second-largest CSQ, at approximately 13 percent, followed by Thailand, at approximately 6 percent, and Egypt, at approximately 2 percent.[1519] During the reporting period, the United States consistently filled its CSQ

[1508] S&P Global, HS heading 1006, rice, accessed June 17, 2024.
[1509] Thailand also exports short and medium grain rice varieties to South Korea at 3,104 mt in 2023.
[1510] Industry representative, interview by USITC staff, August 26–28, 2024.
[1511] Industry representative, interview by USITC staff, August 26–28, 2024.
[1512] Industry representative, interview by USITC staff, August 26–28, 2024.
[1513] USA Rice, "International Markets," accessed December 26, 2024; "Taiwan Opens Market for U.S. Long Grain Rice," December 2, 2014.
[1514] USDA, FAS, *Grain and Feed Annual: Taiwan*, April 4, 2024, 20; USDA, FAS, *Taiwan Food Security Situation Overview*, June 19, 2024, 2.
[1515] USDA, FAS, *Taiwan Food Security Situation Overview*, June 19, 2024, 3.
[1516] USDA, FAS, *Grain and Feed Annual: Taiwan*, April 4, 2024, 22.
[1517] USDA, FAS, PSD Online database, accessed November 4, 2024; S&P Global, HS heading 1006, rice, accessed June 17, 2024.
[1518] RiceOnline, "COA/BOT Announced Three Tender Schedules for 2022 Quota," March 1, 2022; Food HQ, "Country Reports - Taiwan," March 2017.
[1519] USDA, FAS, *Taiwan Finishes Tenders for 2021 US Rice Country Specific Quota*, December 10, 2021.

allotment except for in 2022, when drought conditions in California limited the exportable supply of medium grain rice.[1520]

U.S. competitiveness in Taiwan largely depends on the U.S.'s large CSQ, even though some exporters consider Taiwan's CSQ regime opaque.[1521] The United States also fills its CSQ in Taiwan with both SBS tenders for table rice and normal tenders, which allows U.S. exporters to market to consumers and develop brand recognition among consumers.[1522] For example, an industry association representing U.S. rice promoted U.S.-produced long grain rice starting in 2020 and reported an "initial positive market reaction."[1523] In addition to the long grain market segment, U.S. exporters have an opportunity to compete in Taiwan's aromatic market segment.[1524] U.S. exports to Taiwan in 2021 included sales of jasmine rice. Because of Taiwan's high out-of-quota tariffs, U.S. imports under CSQ of jasmine rice were significantly cheaper than private, out-of-quota imports of Thai jasmine rice, at $28–$32 per metric ton, compared to $485–$521 per metric ton.[1525] However, U.S. supplies of jasmine rice are limited.[1526]

Middle East and North Africa

During MY 2018/19–23/24, the Middle East was the world's third-largest rice importing region, behind Africa and Southeast Asia (figure 2.9). Iraq, Saudi Arabia, and Jordan are the major U.S. markets in the Middle East region.[1527] The region is characterized by consumption of diverse rice types: Saudi Arabia is a large consumer of U.S. parboiled long grain rice; Jordan and the United Arab Emirates are consumers of U.S. medium grain rice; Türkiye is a consumer of both U.S. medium grain and paddy rice; and Iraq is a consumer of U.S. long grain rice.[1528] The U.S. rice industry also reportedly has an interest in entering African markets. Although North Africa has not historically been a large destination market for U.S. rice, Egypt may offer potential as a U.S. market for medium grain exports.[1529]

Throughout the Middle East and North Africa, the U.S. industry faces strong competition from Asian suppliers, including China, India, Thailand, and Vietnam, and to a lesser extent from South American suppliers. A major factor affecting U.S. competitiveness in the region is the higher price of U.S. rice compared to other importers and domestic producers, as is the case in Jordan and Egypt. In comparison to other regions that prefer California medium grain rice (e.g., East Asia), Middle Eastern consumers are more price sensitive and more willing to purchase medium grain rice from southern U.S. producers when

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1520 USDA, FAS, *Taiwan Fulfills 2023 US Country Specific Quota for Rice*, January 5, 2024, 2.
1521 USTR, *2021 National Trade Estimate Report on Foreign Trade Barriers*, March 2021, 476.
1522 USDA, FAS, *Taiwan Fulfills 2023 US Country Specific Quota for Rice*, January 5, 2024.
1523 USA Rice, "U.S. Rice Goes Nationwide at Costco Taiwan," February 15, 2023; "USA Rice Does the Right Thing at Promotions for Costco Taiwan," May 2, 2023.
1524 For more information about the competitiveness of aromatic varieties grown in the United States, see chapter 4.
1525 Reidy, John, "Taiwan Imports More US Jasmine Rice," April 19, 2022; USA Rice, "U.S. Jasmine Rice Proves Popular in Taiwan," April 18, 2022.
1526 Industry representative, interview by USITC staff, September 20, 2024.
1527 USDA, ERS, "Rice: Trade," September 27, 2023.
1528 USITC DataWeb/Census, all subheadings under HS heading 1006, domestic exports, 2018-23, accessed October 17, 2024.
1529 USA Rice, "USA Rice Receives More than $6M in Funding," May 21, 2024; "USA Rice Explores Potential Market Growth," December 11, 2024; "South Africa Trade Mission Taps New Markets," accessed January 3, 2025.

prices for California-produced rice become too expensive.[1530] Although Turkish consumers tend to value quality over price, U.S. rice competitiveness in Türkiye has been negatively affected by a retaliatory tariff that has hampered U.S. exports of medium grain rice. Another major concern is logistics and transportation. During periods in 2024, only one company could transit the Red Sea, and according to an industry representative, this allowed it to charge above market prices.[1531] Although some countries in the region including Egypt, Türkiye, and Iraq produce rice, their supply often has not been sufficient to satisfy consumer demand. Iraq has a history of memorandums of understanding (MOUs) that were signed between governmental entities and the United States for shipments of rice; recently, such U.S. exports were inhibited by the inability of the governing entity to secure U.S. dollars for the transaction.[1532]

Iraq

Iraq is a major importer of long grain rice, including from the United States, and has been an important destination for milled rice produced in the southern U.S. growing region.[1533] Iraq was the third-largest export market for U.S. milled rice in 2023.[1534] Other than in 2020, when the United States did not export rice to Iraq, it has been the third- or fourth-largest destination for U.S. milled rice exports since 2018.[1535] In 2023, U.S. milled rice exports to Iraq reached their highest share, 15.8 percent by volume, of all such U.S. export shipments of this product between 2018 and 2023.[1536]

Iraq's market is characterized by low domestic production and high domestic demand. As a result, over 90 percent of consumption is imported.[1537] The large market for long grain rice imports makes the Iraqi market attractive to U.S. exporters. In 2023, the U.S. share of Iraq's total rice imports was 8.5 percent (table 9.24), suggesting growth potential for U.S. exports.[1538]

[1530] Industry representative, interview by USITC staff, August 2024.
[1531] Industry representative, interview by USITC staff, August 2024; Schulze, "Global Ocean Carriers Halt Red Sea Transit," January 22, 2024.
[1532] USA Rice, "U.S. and Iraq Sign Rice MOU," July 13, 2016; Reuters, "US Bans 14 Iraqi Banks in Crackdown on Iran Dollar Trade," July 19, 2023; Laws, "U.S. Rice Exports to Iraq at Risk after Restrictions Imposed," April 25, 2024.
[1533] The United States exported only milled rice (1006.30) to Iraq from 2018 to 2023. On a tonnage basis, approximately 99 percent of all exports of rice to Iraq were classified under 1006.30, although minimal amounts of paddy, brown, and broken rice were exported to Iraq as well. S&P Global, HS heading 1006, rice, accessed December 8, 2024. All U.S. rice export shipments to Iraq during 2018–23 were recorded as departing from the port of New Orleans, supporting this contention of the origin of U.S. rice exports to Iraq being the southern United States. USITC DataWeb/Census, HTS 1006.10 domestic exports by district, 2018–23, accessed August 28, 2024; Storey, "FEATURE: Confusion Reigns as Iraq Weighs Buying Rice from Thailand, US," July 6, 2022.
[1534] USITC DataWeb/Census, HTS 1006.30 domestic exports, accessed November 4, 2024.
[1535] In the 10 years before the reporting period (2007–17), Iraq's rank as an export market for milled rice hovered between third and 13th depending on the year, with zero exports recorded in 2012. During those 10 years, exports of U.S. milled rice to Iraq exceeded 200,000 mt only twice—in 2007 and 2010. In all other years, exports ranged between zero and about 140,00 mt per year. USITC DataWeb/Census, HTS 1006.30 domestic exports, 2007–17. accessed November 4, 2024
[1536] S&P Global, HS subheading 1006.30, rice, semi-milled or wholly milled, whether or not polished or glazed, accessed January 15, 2025.
[1537] The ratio of annual rice imports to consumption in Iraq for MY 2017/18–2022/23 ranged from 0.79 to 1.1. USDA, FAS, "PSD Online database," accessed December 8, 2024.
[1538] S&P Global, HS heading 1006, rice, accessed December 8, 2024.

Domestic supplies and imports are distributed to consumers through a Public Distribution System (PDS) and private market sales.[1539] Private-sector rice sales reportedly account for approximately 44 percent of total Iraqi consumption.[1540] The remainder is sold through the PDS. In total, the PDS program requires between 1 million and 1.25 million mt of rice to meet these distribution demands annually.[1541] The Iraqi PDS allots citizens 3 kg of rice per month.[1542]

Iraqi farmers grow long grain aromatic rice, with the most popular local types being the Amber and Jasmin varieties.[1543] Local rice production was limited in recent years by water shortages, which impacted all Iraqi agriculture from 2018 to 2023. In June 2018, the Iraqi government restricted rice cultivation in the southern part of the country in favor of directing water resources to other uses and crops.[1544] This policy led to late plantings and lowered yields in MY 2018/19 (table 9.23). Harvested area increased in MY 2019/20, but Iraqi farmers faced water shortages again in 2021 continuing through late 2022.[1545] These shortages led the Iraqi government to decrease the area where rice planting was permitted in MY 2022/23 by 96 percent, diminishing production for the year accordingly.[1546]

Table 9.23 Iraq: rice production, 2017/18–2023/24

In thousands of hectares (ha), metric tons per hectare (mt/ha), and thousands of metric tons (mt).

Measure	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
Harvested area (1,000 ha)	55	6	128	102	96	4	8
Yield (rough) (mt/ha)	3	3	4	5	4	3	4
Milled production (1,000 mt)	125	13	383	309	282	7	20

Source: USDA, FAS, PSD Online database, Iraq, accessed December 8, 2024.

Within the Iraqi market, low supply and high milling costs have typically kept the price of domestically produced rice higher than imports; in 2021, locally milled rice was about $2/kg more than imported rice.[1547] Prices for Iraqi rice imports rose after the 2020 devaluation of the Iraqi currency (the dinar)

[1539] Established in 1990, the PDS is a ration card system through which the government provides a list of subsidized food commodities—including wheat flour, rice, sugar, and vegetable oil—to a majority of the Iraqi population. PDS sources from local crops as well as imports; import purchases through the PDS are determined by the shortfall between the volumes needed for the program and domestic production totals. USDA, FAS, *Grain and Feed Annual: Iraq*, April 15, 2022; IMF, *Iraq: Selected Issues*, July 14, 2015.
[1540] USDA, FAS, *Grain and Feed Annual: Iraq*, June 17, 2020, 11.
[1541] USDA, FAS, *Grain and Feed Annual: Iraq*, April 15, 2022, 12.
[1542] USA Rice, "Iraq," accessed November 4, 2024.
[1543] USDA, FAS, *Grain and Feed Annual: Iraq*, March 14, 2021, 12; 964.com, "Iraq to Resume Cultivation of Amber Rice," June 20, 2024.
[1544] Initially the Iraqi government instituted a ban on rice production—this ban was modified by the Iraqi Ministry of Water Resources later in June 2018 to allow for farmers to produce 1,250 hectares. USDA, FAS, *Grain and Feed Annual: Iraq*, May 9, 2019, 10.
[1545] USDA, FAS, *Grain and Feed Annual: Iraq*, March 14, 2021, 1, 11; USDA, FAS, *Grain and Feed Annual: Iraq*, May 18, 2023, 1, 13.
[1546] USDA, FAS, *Grain and Feed Annual: Iraq*, May 18, 2023, 13.
[1547] USDA, FAS, *Grain and Feed Annual: Iraq*, March 14, 2021, 12. This price difference was also at work to a lesser degree in 2018, when the price for local varieties was as high as $761 per metric ton and imports were priced at $567 per metric ton, equating to a difference of $0.19/kg. USDA, FAS, *Grain and Feed Annual: Iraq*, June 17, 2020, 11.

against the U.S. dollar. In 2021, prices of imports in the local Iraqi market rose by about 150 percent, in keeping with the growth in international prices over this period.[1548]

During 2018–23, Iraqi imports grew and were sourced from a wide array of markets to meet domestic demand (table 9.24). Iraqi rice imports increased 59 percent over the period, driven by an approximately 70 percent increase in domestic consumption between 2017/18 and 2023/24.[1549] Although India was the source of the majority of exports to Iraq from 2018 to 2021, almost all was basmati rice, limiting competition with the United States.[1550] In 2022, after a seven-year lull, Iraq resumed importing rice from Thailand owing to competitive Thai rice prices and a switch in the Iraqi government's procurement processes (see below).[1551] Thailand's exports to Iraq are predominantly grade B white rice,[1552] which would compete closely with U.S. rice exports which are mostly milled long grain rice.[1553] In 2023, the United States exported about 219,000 mt of milled rice to Iraq. Total U.S. export quantities of rice to Iraq before 2023 fluctuated, however, with no U.S. exports of rice to Iraq in 2020.[1554]

Table 9.24 Iraq: imports of milled rice, by trade partner, 2018–23

In millions of metric tons and percentages (%). ** = rounds to 0 (less than 500 metric tons).

Trade partner	2018	2019	2020	2021	2022	2023	Share of total imports 2018–23 (%)
India	420	512	816	745	376	694	40.8
Thailand	29	86	24	257	1,600	854	32.6
United States	157	154	0	120	88	219	8.5
Uruguay	218	62	4	128	3	34	5.1
Vietnam	179	300	90	**	0	0	6.5
All other	152	187	70	68	43	39	6.4
Total	1,155	1,301	1,004	1,317	2,110	1,840	100.0

Source: S&P Global, General imports, HS heading 1006, rice, accessed December 8, 2024. Iraq import data were calculated by aggregating exports to Iraq as reported by all other countries.

1548 USDA, FAS, *Grain and Feed Annual: Iraq*, April 15, 2022, 12; USDA, FAS, *Grain and Feed Annual: Iraq*, March 14, 2021, 12.

1549 USDA, FAS, PSD Online database, Iraq, accessed December 8, 2024; USA Rice, "Second Sale Made to Iraq in 2022–2023 MOU," January 3, 2023.

1550 Basmati is classified under subheading 1006.30.20 in the Harmonized Tariff Schedule of India. Small amounts of non-basmati milled rice, both parboiled (1006.30.10) and non-parboiled (1006.30.90) were exported from India to Iraq over this time period as well. S&P Global, HS heading 1006, rice, accessed December 8, 2024.

1551 Iraq began boycotting Thai rice in 2014 because of quality issues. Thomas and Storey, "Iraq emerges to dominate Thai white rice market," May 24, 2022.

1552 Other white non-glutinous rice 100% Grade B is classified under tariff line 1006.30.99.010 in the Thai Customs Tariff Schedule, which extends to 11 digits. Government of Thailand, Customs, "Search for Import Tariffs - Integrated Tariff Database," accessed January 8, 2025. Small amounts of grade A Hom Mali (1006.30.40.001) and other milled non-glutinous white rice (nonaromatic and nonorganic, per descriptions in 1006.30.99.012 and 1006.30.99.090) are exported from Thailand to Iraq as well. S&P Global, HS heading 1006, rice, accessed December 8, 2024.

1553 Census, Schedule B—Classification of Exports, 1006.30.9010, accessed December 8, 2024.

1554 Iraqi imports of rice were down during the 2020 calendar year overall, because oil revenues, which fund the Iraqi government's wheat and rice imports, were negatively impacted by the steep decline in oil prices resulting from the COVID-19 pandemic. Tomson, "Rice Farmers Hope Cash Infusion Spurs Iraqi Imports," August 18, 2020.

Iraq imports rice through public and private channels. In the public channel, 85 percent of all Iraqi rice imports arrive via tenders associated with the PDS.[1555] The Iraqi Grain Board had the sole authority to purchase imports for the PDS up until 2021, when it transferred that authority to Al-Awees Company for Trade, General Contracting, Food Supplies, and Food Industries Limited (Al-Awees).[1556] Rice for the PDS can be imported from countries approved by the Ministry of Trade, which include Argentina, Brazil, Thailand, the United States, Uruguay, and Vietnam.[1557]

To ensure access to the Iraqi PDS market, the United States signed an MOU with Iraq's trade minister on rice purchases in 2016, ensuring two three-month supply contracts with U.S. exporters.[1558] In the years following, Iraq sometimes exceeded the volume of these purchase agreements.[1559] In July 2021, when Al-Awees became the entity purchasing imported rice for the PDS, the company soon after signed an MOU with the United States committing to purchases of 200,000 mt of U.S. rice each year. These commitments were met in both MY 2021/22 and MY 2022/23, despite Al-Awees experiencing some difficulty accessing financing for these purchases.[1560] This MOU also allows for the purchase of bulk shipments of rice from the United States, which Iraq had not permitted from any country since 2015.[1561]

Other Middle Eastern and North African Markets

Jordan and Türkiye are two Middle Eastern markets that have traditionally been large markets for U.S. rice. In recent years, however, the United States has lost market share in these markets, though for different reasons. Both markets associate U.S. rice with quality; however, the United States has lost market share in Jordan because of a lack of price competitiveness and in Türkiye because of the imposition of a high tariff on U.S. rice imports.

[1555] The entire population of Iraq was eligible to received PDS at one point for a nominal monthly fee; in 2016, certain high-ranking government employees and people above a certain income level were excluded from eligibility. Phadera, Sharma, and Wai-Poi, "Iraq's Universal Public Distribution System," February 2020; USA Rice, "Iraq," accessed November 4, 2024.
[1556] USDA, FAS, *Grain and Feed Annual: Iraq*, April 15, 2022, 12.
[1557] USDA, FAS, *Grain and Feed Annual: Iraq*, May 18, 2023, 15.
[1558] The MOU is continuous; 44,000 mt was confirmed on Dec 16, 2024. The total MOU amount for 2024 MOU year was 200,000 mt. USA Rice, "U.S. and Iraq Sign Rice MOU," July 13, 2016; Ag Exports Count, "USA Rice Creates Stable Market in Iraq via MOU," accessed November 4, 2024.
[1559] USA Rice, "Latest US Rice Sale to Iraq A Shot in the Arm," October 5, 2018.
[1560] USA Rice, "Framework for Rice Sales to Iraq Proves Successful," January 17, 2024. U.S. Representatives Higgins, Crawford, and Letlow, "Letter to U.S. Ambassador to Iraq, Alina Romanowski," November 29, 2023. A 2023 ban on 14 Iraqi banks from the dollar auction led to restrictions on the amount of U.S. dollars Al-Awees could acquire for the purchase of U.S. rice imports. *Reuters*, "US Bans 14 Iraqi Banks in Crackdown on Iran Dollar Trade," July 19, 2023; Laws, "U.S. Rice Exports to Iraq at Risk after Restrictions Imposed," April 25, 2024. These issues persisted in 2024, when the U.S. Department of the Treasury's Office of Foreign Assets Control banned eight Iraqi banks from buying dollars under the Central Bank of Iraq's "dollar auction" as part of a crackdown on currency smuggling and terrorism financing activities. Azhari, "Iraq Bans 8 Local Banks from US Dollar Transactions," February 4, 2024; Laws, "U.S. Rice Exports to Iraq at Risk after Restrictions Imposed," April 25, 2024. The Iraqi government announced that it would retire the auction process at the end of 2024 to better integrate Iraq into the international economy, including establishing correspondent banking relationships with foreign banks. al-Qaher, "Action Taken to Close Currency Sale Window, Prevent Dollar Leakage," June 5, 2024.
[1561] Ag Exports Count, "USA Rice Creates Stable Market in Iraq via MOU," accessed November 4, 2024; USA Rice, "Discussions with Iraqi Grain Board Smooth the Way for U.S. Rice Trade," February 18, 2020.

Jordan is an example of a destination market where price competitiveness has affected U.S. exports. Although Jordan was one of the three largest importers of medium grain rice until 2021, U.S. medium grain rice exports to Jordan have declined steadily since 2018.[1562] Rice is a staple of the Jordanian diet, with an average annual consumption of 24 kg per person.[1563] Although rice is widely consumed in Jordan, the climate is not conducive to producing rice, given the high water demands.[1564] Jordanian consumers prefer Camolino, a medium grain variety which constitutes over 50 percent of imports, followed by long grain white rice.[1565] Basmati and aromatic rice are also imported, but at lower levels, as they are more expensive and generally less preferred.[1566]

Historically, the United States was the largest source of rice to Jordan but has been losing its export share, particularly to India, Portugal, and Australia.[1567] U.S. exports of medium grain rice to Jordan averaged 82,800 mt from 2018 to 2020, dropping significantly to 35,300 mt on average from 2020 to 2023.[1568] India gained a foothold in the Jordanian rice market during the COVID-19 pandemic, when consumers faced economic pressures and therefore substituted lower-priced rice.[1569] From January 2018 to April 2023, average imported rice prices increased from $1.71 to $1.96 per kg across Jordanian retail markets.[1570] Over the same period, U.S. export prices increased from $0.86 to $1.70.[1571] Comparatively, India's rice export prices increased less sharply, from $0.38 to $0.47 per kg over the same period.[1572] Other factors affecting U.S. competitiveness include increased freight costs and shortages in U.S. supply in MY 2023/24.[1573] The U.S. rice industry was able to maintain a foothold in Jordan because of marketing efforts and brand loyalty for U.S. rice among some Jordanian consumers.[1574] However, the higher price of U.S. rice clearly affected U.S. export volumes.

Türkiye is an example of a market that values high quality rice, which should create an advantage for U.S. rice; however, U.S. competitiveness is being impacted by high tariff rates on U.S. rice. Medium grain rice

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1562 USITC DataWeb/Census, Domestic exports, HTS subheading 1006.30.9020, accessed October 17, 2024.
1563 USDA, FAS, *Grain and Feed Annual: Jordan*, April 8, 2024, 14.
1564 USDA, FAS, *Grain and Feed Annual: Jordan*, April 8, 2024, 14.
1565 Camolino rice, sometimes called Egyptian camolino or calrose camolino, is a variety of medium grain japonica rice where grains are coated in oil to change its texture and provide glossiness after it is cooked. Camolino rice is preferred by Middle Eastern consumers. Camolino rice is offered by ACC, a California producer, and some other global sources. American Commodity Company, "Calrose Camolino," accessed October 2, 2024; Lacasa Business Group, "Rice," accessed October 2, 2024; USDA, FAS, *Grain and Feed Annual: Jordan*, April 8, 2024, 15.
1566 USDA, FAS, *Grain and Feed Annual: Jordan*, April 8, 2024, 15; USDA, FAS, *Grain and Feed Annual: Jordan*, April 13, 2022, 10.
1567 USA Rice, "Market Fact Sheet: Jordan," January 2020; USDA, FAS, *Grain and Feed Annual: Jordan*, April 8, 2024, 15.
1568 USITC DataWeb/Census, HTS subheading 1006.30.9020 domestic exports 2018-23, accessed October 17, 2024.
1569 USDA, FAS, *Grain and Feed Annual: Jordan*, April 13, 2022, 10.
1570 Based on simple average of four retail markets–Al Mafraq, Amman, Irbid, and Zarqa; FAO, "FPMA Tool," accessed October 2, 2024.
1571 Based on U.S. California Medium Grain. FAO, "FPMA Tool," accessed October 2, 2024; As of July 2024, U.S. rice export prices decreased to $0.89 per kg.
1572 Based on Rice (25 percent broken). FAO, "FPMA Tool," accessed October 2, 2024.
1573 USDA, FAS, *Grain and Feed Annual: Jordan*, April 8, 2024, 15. The United States and Jordan have a free trade agreement, but it did not provide advantages to the United States in rice trade because the import duty on rice in Jordan is zero for all origins. Jordan Free Trade Agreement (December 17, 2001), art. Annex 2.1; USDA, FAS, *Grain and Feed Annual: Jordan*, April 13, 2022, 11.
1574 USDA, FAS, *Grain and Feed Annual: Jordan*, April 13, 2022, 10.

is used in many common Turkish dishes.[1575] Türkiye both produces and imports rice, though domestic rice is considered higher quality and is priced higher than imported Asian rice.[1576] At the same time, availability of affordable substitutes to rice has contributed to the price sensitivity of consumers.[1577]

The import share of U.S. rice decreased significantly, from 25 percent of Turkish rice imports in 2017 to 1 percent in 2018 because a 50 percent retaliatory tariff on U.S. rice was introduced in August 2018.[1578] The tariff was reduced to 25 percent in May 2019 but was added to regular duties, which brought the tariff rate for U.S. rice to 70 percent for milled rice, 51 percent for brown rice, and 59 percent for paddy rice.[1579] The Turkish government has adjusted tariff rates to counteract inflation. For example, the Turkish government zeroed out additional tariffs on imports of rice from December 2022 to August 2023, at which point tariffs on paddy and milled rice returned to former MFN levels.[1580]

The U.S. rice industry has also expressed an interest in entering the North African market. Egypt is a potential entry point, as it is one of the larger rice consumers in the region with annual rice consumption averaging about 4.2 million mt from 2018 to 2023.[1581] Egyptians have traditionally consumed short and medium grain rice; however, starting in 2021, demand increased for long grain, jasmine, and other varieties of rice with less starch content.[1582]

Until 2018, Egypt was largely self-sufficient in terms of rice production, growing mostly short and medium grain rice. Concern about water resources prompted the Egyptian Ministry of Water Resources and Irrigation to limit the hectares of land on which rice could be planted and to impose fines on farmers for cultivating rice outside allotted areas.[1583] The combination of cultivation limits and price controls

[1575] In particular, baldo, osmancik, and calrose are preferred. USDA, FAS, *Grain and Feed Annual: Türkiye*, April 4, 2024, 12.
[1576] These cheaper imports are widely used in the hospitality and foodservice sector in recent years as a result of competitive pricing. Most imports are of medium grain varieties of rice, but some lower-priced long grain varieties are imported for the catering sector. USDA, FAS, *Grain and Feed Annual: Türkiye*, April 1, 2019, 18 & 30; USDA, FAS, *Grain and Feed Update: Türkiye*, October 18, 2023, 5; USDA, FAS, *Grain and Feed Annual: Türkiye*, April 4, 2024, 12.
[1577] USDA, FAS, *Grain and Feed Update: Türkiye*, October 18, 2023, 5.
[1578] Türkiye introduced a tariff on U.S. rice in retaliation for U.S. tariffs on Turkish steel and aluminum imposed under Section 232 authority. USA Rice, "Market Fact Sheet: Turkey," January 2020; USDA, FAS, *Grain and Feed Annual: Türkiye*, April 1, 2019, 32.
[1579] USA Rice, "Market Fact Sheet: Turkey," January 2020.
[1580] USDA, FAS, *Grain and Feed Update: Türkiye*, October 18, 2023, 5.
[1581] USDA, FAS, PSD Online database, November 4, 2024.
[1582] Short and medium grain rice are also the types of rice that Egyptian producers have traditionally grown. Movement toward long grain and other rice varieties with less starch content has been attributed to a segment of consumers seeking a healthier lifestyle. USDA, FAS, *Grain and Feed Annual: Egypt*, March 17, 2021, 12.
[1582] Rice acreage tends to exceed official limits because of the crop's profitability and its use in desalination. FAO, *Rice Market Monitor*, April 2018, 7; despite previous restrictions reportedly not being strictly enforced until 2018. Lasheen, "A History and Policy Analysis of Rice, Water, and the Edible Landscape in Egypt," 19–20 and 168.
[1583] USDA, FAS, *Grain and Feed Update: Egypt*, September 9, 2018, 8; USDA, FAS, *Grain and Feed Update: Egypt*, September 16, 2021, 7.

imposed to protect consumers from rising rice prices led to volatility in domestic production, as producers shifted to other crops.[1584]

After the introduction of the cultivation limits, Egypt increasingly relied on imports of rice to satisfy demand, primarily importing rice from India, China, and Thailand.[1585] From 2018 to 2023, the United States supplied a negligible share of Egyptian rice imports, totaling 96.2 mt (16.0 mt on average annually). U.S. rice exports to Egypt surged in 2021 to 45.2 mt but declined in the years since then.[1586] The lack of price competitiveness hampered exports of U.S. rice. At nearly half the price of U.S. medium grain rice, Chinese rice and that of other importers was a more desirable choice, especially considering the price sensitivity of consumers.[1587]

[1584] Before 2021, imports were largely short and medium grain rice varieties; however, starting in 2021, imports of basmati, jasmine, and long grain rice increased. USDA, FAS, *Grain and Feed Annual: Egypt*, March 14, 2019, 12–13; USDA, FAS, *Grain and Feed Annual: Egypt*, March 17, 2021, 12; USDA, FAS, *Grain and Feed Update: Egypt*, September 16, 2021, 7.
[1585] USDA, FAS, *Grain and Feed Update: Egypt*, September 15, 2019, 9; USDA, FAS, *Grain and Feed Annual: Egypt*, April 23, 2024, 15.
[1586] S&P Global, HS headings 1006, rice, accessed June 17, 2024.
[1587] Market analysis of consumer preferences for branded packaged rice found price and value for money factored into consumers' decision, especially among lower income consumers. Increases in the price of rice have led to consumer substitution of rice for cheaper carbohydrate alternatives, such as pasta. Overall, the consumer substitution rate seems to be higher when rice prices are high. Rice consumption increases when supply and prices stabilize postharvest. Elgebali, "Branded Food Commodities," July 12, 2019, 56; USDA, FAS, *Grain and Feed Update: Egypt*, November 15, 2023, 8; USDA, FAS, *Grain and Feed Update: Egypt*, September 16, 2021, 7; USDA, *FAS, Grain and Feed Update: Egypt*, September 15, 2019, 9.

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Appendix A
Request Letter

JASON SMITH
MISSOURI,
CHAIRMAN

MARK ROMAN, STAFF DIRECTOR
(202) 225–3625

DOCKET NUMBER 3721
OFFICE OF THE SECRETARY
INT'L TRADE COMMISSION

U.S. House of Representatives

COMMITTEE ON WAYS AND MEANS
1139 LONGWORTH HOUSE OFFICE BUILDING
Washington, DC 20515

RICHARD E. NEAL
MASSACHUSETTS,
RANKING MEMBER

BRANDON CASEY, STAFF DIRECTOR
(202) 225–4021

RECEIVED
February 5, 2024
OFFICE OF THE
SECRETARY
U.S. INT'L TRADE
COMMISSION

February 5, 2024

The Honorable David S. Johanson
Chairman
U.S. International Trade Commission
500 E Street, SW
Washington, DC 20436

Dear Chairman Johanson,

As you know, the Committee on Ways and Means previously requested that the U.S. International Trade Commission (USITC) investigate and produce a report on the global competitiveness of the U.S. rice industry. This 2015 report provided valuable insight into the global rice market for producers and policy makers alike. Pursuant to section 332(g) of the Tariff Act of 1930 (19 U.S.C. 1332(g)), the Committee requests that the USITC conduct an additional investigation and produce a report on this subject, primarily focused on the 2018-2023 period.

To the extent data and information are available, the report should contain updates to the 2015 report where significant changes have been observed during the 2018-2023 period. Specifically, the report should contain:

- information on recent developments in the rice industries in the United States and other major global producing and exporting countries, such as Bangladesh, Brazil, China, India, Indonesia, Pakistan, Paraguay, Thailand, Uruguay, and Vietnam;
- information on recent trade trends and developments in the global market for rice, including U.S. and major foreign supplier imports and exports;
- a comparison of the competitive strengths and weaknesses of rice production in and exports from the United States and other major exporting countries, focusing on factors affecting delivered cost, product differentiation, and reliability of supply, as well as government policies and programs that directly or indirectly affect rice production and exporting in these countries;
- a qualitative and, to the extent possible, quantitative assessment of the impact of government policies and programs, including public stockholding programs and export restrictions, of major producing and exporting countries on U.S. rice production,

producer revenues and profits, consumption, trade, and prices, as well as on food security in developing countries; and

- an overview of the impact on the U.S. rice industry of exports from the highlighted countries of rice to the United States and to traditional export markets of the United States.

The Committee requests that the USITC transmit its report to Congress no later than 13 months following the receipt of this request. The Committee intends to make the report public. Therefore, the report should not include confidential business information.

Sincerely,

Jason Smith
Chairman
Committee on Ways and Means

Appendix B
Federal Register Notice

Limited disclosure of business proprietary information (BPI) under an administrative protective order (APO) and BPI service list.—Pursuant to § 207.7(a) of the Commission's rules, the Secretary will make BPI gathered in the final phase of these investigations available to authorized applicants under the APO issued in the investigations, provided that the application is made no later than 21 days prior to the hearing date specified in this notice. Authorized applicants must represent interested parties, as defined by 19 U.S.C. 1677(9), who are parties to the investigations. A party granted access to BPI in the preliminary phase of the investigations need not reapply for such access. A separate service list will be maintained by the Secretary for those parties authorized to receive BPI under the APO.

Staff report.—The prehearing staff report in the final phase of these investigations will be placed in the nonpublic record by 5:15 p.m. on April 26, 2024, and a public version will be issued thereafter, pursuant to § 207.22 of the Commission's rules.

Hearing.—The Commission will hold a hearing in connection with the final phase of these investigations beginning at 9:30 a.m. on May 9, 2024. Requests to appear at the hearing should be filed in writing with the Secretary to the Commission by 5:15 p.m. on May 3, 2024. Any requests to appear as a witness via videoconference must be included with your request to appear. Requests to appear via videoconference must include a statement explaining why the witness cannot appear in person; the Chairman, or other person designated to conduct the investigations, may in their discretion for good cause shown, grant such a request. Requests to appear as remote witness due to illness or a positive COVID–19 test result may be submitted by 3 p.m. the business day prior to the hearing. Further information about participation in the hearing will be posted on the Commission's website at *https://www.usitc.gov/calendarpad/calendar.html.*

A nonparty who has testimony that may aid the Commission's deliberations may request permission to present a short statement at the hearing. All parties and nonparties desiring to appear at the hearing and make oral presentations should attend a prehearing conference, if deemed necessary, to be held at 9:30 a.m. on May 7, 2024. Parties shall file and serve written testimony and presentation slides in connection with their presentation at the hearing by no later than 4:00 p.m. on May 8, 2024. Oral testimony and written materials to be submitted at the public hearing are governed by sections 201.6(b)(2), 201.13(f), and 207.24 of the Commission's rules. Parties must submit any request to present a portion of their hearing testimony *in camera* no later than 7 business days prior to the date of the hearing.

Written submissions.—Each party who is an interested party shall submit a prehearing brief to the Commission. Prehearing briefs must conform with the provisions of § 207.23 of the Commission's rules; the deadline for filing is 5:15 p.m. on May 3, 2024. Parties shall also file written testimony in connection with their presentation at the hearing, and posthearing briefs, which must conform with the provisions of § 207.25 of the Commission's rules. The deadline for filing posthearing briefs is 5:15 p.m. on May 16, 2024. In addition, any person who has not entered an appearance as a party to the investigations may submit a written statement of information pertinent to the subject of the investigations, including statements of support or opposition to the petitions, by 5:15 p.m. on May 16, 2024. On June 4, 2024, the Commission will make available to parties all information on which they have not had an opportunity to comment. Parties may submit final comments on this information by 5:15 p.m. on June 6, 2024, but such final comments must not contain new factual information and must otherwise comply with § 207.30 of the Commission's rules. All written submissions must conform with the provisions of § 201.8 of the Commission's rules; any submissions that contain BPI must also conform with the requirements of §§ 201.6, 207.3, and 207.7 of the Commission's rules. The Commission's *Handbook on Filing Procedures,* available on the Commission's website at *https://www.usitc.gov/documents/handbook_on_filing_procedures.pdf,* elaborates upon the Commission's procedures with respect to filings.

Additional written submissions to the Commission, including requests pursuant to § 201.12 of the Commission's rules, shall not be accepted unless good cause is shown for accepting such submissions, or unless the submission is pursuant to a specific request by a Commissioner or Commission staff.

In accordance with §§ 201.16(c) and 207.3 of the Commission's rules, each document filed by a party to the investigations must be served on all other parties to the investigations (as identified by either the public or BPI service list), and a certificate of service must be timely filed. The Secretary will not accept a document for filing without a certificate of service.

Authority: These investigations are being conducted under authority of title VII of the Tariff Act of 1930; this notice is published pursuant to § 207.21 of the Commission's rules.

By order of the Commission.

Issued: March 1, 2024.

Lisa Barton,

Secretary to the Commission.

[FR Doc. 2024–04774 Filed 3–5–24; 8:45 am]

BILLING CODE 7020–02–P

INTERNATIONAL TRADE COMMISSION

[Investigation No. 332–603]

Rice: Global Competitiveness and Impacts on Trade and the U.S. Industry

AGENCY: United States International Trade Commission.

ACTION: Notice of investigation and scheduling of a public hearing.

SUMMARY: Following receipt on February 5, 2024, of a request from the U.S. House of Representatives Committee on Ways and Means (Committee) under section 332(g) of the Tariff Act of 1930, the U.S. International Trade Commission (Commission) instituted Investigation No. 332–603, *Rice: Global Competitiveness and Impacts on Trade and the U.S. Industry.* The Committee requested that the Commission conduct an investigation and produce a report on the global competitiveness of the U.S. rice industry.

DATES:

April 8, 2024: Deadline for filing requests to appear at the public hearing.

April 11, 2024: Deadline for filing prehearing briefs and statements.

April 22, 2024: Deadline for filing electronic copies of oral hearing statements.

April 30, 2024: Public hearing.

May 22, 2024: Deadline for filing posthearing briefs.

July 12, 2024: Deadline for filing all other written submissions.

March 5, 2025: Transmittal of Commission report to the Committee.

ADDRESSES: All Commission offices, including the Commission's hearing rooms, are located in the U.S. International Trade Commission Building, 500 E Street SW, Washington, DC. All written submissions should be addressed to the Secretary, U.S. International Trade Commission, 500 E Street SW, Washington, DC 20436. The public record for this investigation may be viewed on the Commission's electronic docket (EDIS) at *https://edis.usitc.gov.*

FOR FURTHER INFORMATION CONTACT: Project Leader Renee Berry (202–205–3498 or *renee.berry@usitc.gov*) or Deputy Project Leaders Patrick Crotty (202–205–2224 or *patrick.crotty@usitc.gov*) and Tyler Daun (202–205–3329 or *tyler.daun@usitc.gov*) for information specific to this investigation. For information on the legal aspects of this investigation, contact Brian Allen (202–205–3034 or *brian.allen@usitc.gov*) or William Gearhart (202–205–3091 or *william.gearhart@usitc.gov*) of the Commission's Office of the General Counsel. The media should contact Jennifer Andberg, Office of External Relations (202–205–3404 or *jennifer.andberg@usitc.gov*). Hearing-impaired individuals are advised that information on this matter can be obtained by contacting the Commission's TDD terminal on 202–205–1810. General information concerning the Commission may be obtained by accessing its internet address (*https://www.usitc.gov*). Persons with mobility impairments who will need special assistance in gaining access to the Commission should contact the Office of the Secretary at 202–205–2000.

SUPPLEMENTARY INFORMATION:

Background: As requested by the Committee, the Commission has instituted an investigation under section 332(g) of the Tariff Act of 1930 (19 U.S.C. 1332(g)) to produce a report on the global competitiveness of the U.S. rice industry. This report will contain updates to the Commission's 2015 report on the same topic (*Rice: Global Competitiveness of the U.S. Industry,* Pub. 4530) where significant changes have been observed during the 2018 to 2023 period. Specifically, the report will contain:

- information on recent developments in the rice industries in the United States and other major global producing and exporting countries, such as Bangladesh, Brazil, China, India, Indonesia, Pakistan, Paraguay, Thailand, Uruguay, and Vietnam;
- information on recent trade trends and developments in the global market for rice, including U.S. and major foreign supplier imports and exports;
- a comparison of the competitive strengths and weaknesses of rice production in and exports from the United States and other major exporting countries, focusing on factors affecting delivered cost, product differentiation, and reliability of supply, as well as government policies and programs that directly or indirectly affect rice production and exporting in these countries;
- a qualitative and, to the extent possible, quantitative assessment of the impact of government policies and programs, including public stockholding programs and export restrictions, of major producing and exporting countries on U.S. rice production, product revenues and profits, consumption, trade, and prices, as well as on food security in developing countries; and
- an overview of the impact on the U.S. rice industry of exports of rice from the highlighted countries to the United States and to traditional export markets of the United States.

As requested by the Committee, the Commission will deliver the report no later than March 5, 2025. The Committee asked that the Commission not include confidential business or national security classified information in its report. However, as detailed below, participants may submit confidential information to the Commission to inform its understanding of these issues, and such information will be protected in accordance with the Commission's *Rules of Practice and Procedure.* Participants are strongly encouraged to provide any supporting data and information along with their views.

Public Hearing: A public hearing in connection with this investigation will be held beginning at 9:30 a.m., April 30, 2024, in the Main Hearing Room of the U.S. International Trade Commission, 500 E Street SW, Washington, DC 20436. The hearing can also be accessed remotely using the WebEx videoconference platform. A link to the hearing will be posted on the Commission's website at *https://www.usitc.gov/calendarpad/calendar.html.*

Requests to appear at the hearing should be filed with the Secretary to the Commission no later than 5:15 p.m., April 8, 2024, in accordance with the requirements in the ''Written Submissions'' section below. Any requests to appear as a witness via videoconference must be included with your request to appear. Requests to appear as a witness via videoconference must include a statement explaining why the witness cannot appear in person; the Chairman, or other person designated to conduct the investigation, may at their discretion for good cause shown, grant such requests. Requests to appear as a witness via videoconference due to illness or a positive COVID–19 test result may be submitted by 3 p.m. the business day prior to the hearing.

All prehearing briefs and statements should be filed no later than 5:15 p.m., April 11, 2024. To facilitate the hearing, including the preparation of an accurate written public transcript of the hearing, oral testimony to be presented at the hearing must be submitted to the Commission electronically no later than noon, April 22, 2024. All posthearing briefs and statements should be filed no later than 5:15 p.m., May 22, 2024. Posthearing briefs and statements should address matters raised at the hearing. For a description of the different types of written briefs and statements, see the ''Definitions'' section below. In the event that, as of the close of business on April 8, 2024, no witnesses are scheduled to appear at the hearing, the hearing will be canceled. Any person interested in attending the hearing as an observer or nonparticipant should check the Commission website as indicated above for information concerning whether the hearing will be held.

Written submissions: In lieu of or in addition to participating in the hearing, interested persons are invited to file written submissions concerning this investigation. All written submissions should be addressed to the Secretary, and should be received no later than 5:15 p.m., July 12, 2024. All written submissions must conform to the provisions of section 201.8 of the Commission's *Rules of Practice and Procedure* (19 CFR 201.8), as temporarily amended by 85 FR 15798 (March 19, 2020). Under that rule waiver, the Office of the Secretary will accept only electronic filings at this time. Filings must be made through the Commission's Electronic Document Information System (EDIS, *https://edis.usitc.gov*). No in-person paper-based filings or paper copies of any electronic filings will be accepted until further notice. Persons with questions regarding electronic filing should contact the Office of the Secretary, Docket Services Division (202–205–1802), or consult the Commission's Handbook on Filing Procedures.

Definitions of types of documents that may be filed; Requirements: In addition to requests to appear at the hearing, this notice provides for the possible filing of four types of documents: prehearing briefs, oral hearing statements, posthearing briefs, and other written submissions.

(1) *Prehearing briefs* refers to written materials relevant to the investigation and submitted in advance of the hearing, and includes written views on matters that are the subject of the investigation, supporting materials, and any other written materials that you

consider will help the Commission in understanding your views. You should file a prehearing brief particularly if you plan to testify at the hearing on behalf of an industry group, company, or other organization, and wish to provide detailed views or information that will support or supplement your testimony.

(2) *Oral hearing statements (testimony)* refers to the actual oral statement that you intend to present at the hearing. Do not include any confidential business information (CBI) in that statement. If you plan to testify, you must file a copy of your oral statement by the date specified in this notice. This statement will allow Commissioners to understand your position in advance of the hearing and will also assist the court reporter in preparing an accurate transcript of the hearing (*e.g.,* names spelled correctly).

(3) *Posthearing briefs* refers to submissions filed after the hearing by persons who appeared at the hearing. Such briefs: (a) should be limited to matters that arose during the hearing; (b) should respond to any Commissioner and staff questions addressed to you at the hearing; (c) should clarify, amplify, or correct any statements you made at the hearing; and (d) may, at your option, address or rebut statements made by other participants in the hearing.

(4) *Other written submissions* refers to any other written submissions that interested persons wish to make, regardless of whether they appeared at the hearing, and may include new information or updates of information previously provided.

In accordance with the provisions of section 201.8 of the Commission's Rules of Practice and Procedure (19 CFR 201.8) the document must identify on its cover (1) the investigation number and title and the type of document filed (*i.e.,* prehearing brief, oral statement of (name), posthearing brief, or written submission), (2) the name and signature of the person filing it, (3) the name of the organization that the submission is filed on behalf of, and (4) whether it contains CBI. If it contains CBI, it must comply with the marking and other requirements set out below in this notice relating to CBI. Submitters of written documents (other than oral hearing statements) are encouraged to include a short summary of their position or interest at the beginning of the document, and a table of contents when the document addresses multiple issues.

Confidential business information: Any submissions that contain CBI must also conform to the requirements of section 201.6 of the Commission's Rules of Practice and Procedure (19 CFR 201.6). Section 201.6 of the rules requires that the cover of the document and the individual pages be clearly marked as to whether they are the ''confidential'' or ''nonconfidential'' version, and that the CBI is clearly identified by means of brackets. All written submissions, except for CBI, will be made available for inspection by interested persons.

As requested by the Committee, the Commission will not include any CBI in its report. However, all information, including CBI, submitted in this investigation may be disclosed to and used by: (i) the Commission, its employees and offices, and contract personnel (a) for developing or maintaining the records of this or a related proceeding, or (b) in internal investigations, audits, reviews, and evaluations relating to the programs, personnel, and operations of the Commission, including under 5 U.S.C. Appendix 3; or (ii) U.S. Government employees and contract personnel for cybersecurity purposes. The Commission will not otherwise disclose any CBI in a way that would reveal the operations of the firm supplying the information.

Summaries of written submissions: Persons wishing to have a summary of their position included in the report should include a summary with their written submission on or before July 12, 2024, and should mark the summary as having been provided for that purpose. The summary should be clearly marked as ''summary for inclusion in the report'' at the top of the page. The summary may not exceed 500 words and should not include any CBI. The summary will be published as provided if it meets these requirements and is germane to the subject matter of the investigation. The Commission will list the name of the organization furnishing the summary and will include a link where the written submission can be found.

By order of the Commission.

Issued: February 29, 2024.

Lisa Barton,

Secretary to the Commission.

[FR Doc. 2024–04649 Filed 3–5–24; 8:45 am]

BILLING CODE 7020–02–P

DEPARTMENT OF JUSTICE

Drug Enforcement Administration

[Docket No. DEA–1324]

Importer of Controlled Substances Application: AndersonBrecon Inc. dba PCI Pharma Services

AGENCY: Drug Enforcement Administration, Justice.

ACTION: Notice of application.

SUMMARY: AndersonBrecon Inc. dba PCI Pharma Services has applied to be registered as an importer of basic class(es) of controlled substance(s). Refer to **SUPPLEMENTARY INFORMATION** listed below for further drug information.

DATES: Registered bulk manufacturers of the affected basic class(es), and applicants therefore, may submit electronic comments on or objections to the issuance of the proposed registration on or before April 5, 2024. Such persons may also file a written request for a hearing on the application on or before April 5, 2024.

ADDRESSES: The Drug Enforcement Administration requires that all comments be submitted electronically through the Federal eRulemaking Portal, which provides the ability to type short comments directly into the comment field on the web page or attach a file for lengthier comments. Please go to *https://www.regulations.gov* and follow the online instructions at that site for submitting comments. Upon submission of your comment, you will receive a Comment Tracking Number. Please be aware that submitted comments are not instantaneously available for public view on *https://www.regulations.gov.* If you have received a Comment Tracking Number, your comment has been successfully submitted and there is no need to resubmit the same comment. All requests for a hearing must be sent to: (1) Drug Enforcement Administration, Attn: Hearing Clerk/OALJ, 8701 Morrissette Drive, Springfield, Virginia 22152; and (2) Drug Enforcement Administration, Attn: DEA Federal Register Representative/DPW, 8701 Morrissette Drive, Springfield, Virginia 22152. All requests for a hearing should also be sent to: Drug Enforcement Administration, Attn: Administrator, 8701 Morrissette Drive, Springfield, Virginia 22152.

SUPPLEMENTARY INFORMATION: In accordance with 21 CFR 1301.34(a), this is notice that on September 29, 2023, AndersonBrecon Inc. dba PCI Pharma Services, 5775 Logistics Parkway, Rockford, Illinois 61109–3608, applied

Appendix C
Hearing Calendar

CALENDAR OF PUBLIC HEARING

Those listed below appeared in the United States International Trade Commission's hearing:

Subject: Rice: Global Competitiveness and Impacts on Trade and the U.S. Industry

Inv. No.: 332-603

Dates and Times: Tuesday, April 30, 2024 - 9:30 a.m. EST

Sessions were held in connection with this investigation in the Main Hearing Room (Room 101), 500 E Street, SW., Washington, DC.

EMBASSY APPEARANCE:

Embassy of Pakistan
Washington, DC

Ahsan Ali Mangi (remote witness), Additional Secretary, Ministry of Commerce, Government of Pakistan

Muhammad Hanif Channa, Minister, Trade and Investment

Bilal Akram Shah, Counsellor

PANEL 1:

ORGANIZATION AND WITNESSES:

Rice Exporters Association of Pakistan ("REAP")
Pakistan

Haseeb Ali Khan (remote witness), Senior Vice Chairman, REAP

Ali Narang (remote witness), Member Managing Committee, REAP

USA Rice Federation
Arlington, VA

Kirk Satterfield, Chair

PANEL 1 (continued):

USA Rice Federation
Arlington, VA

Peter Bachmann, President and Chief Executive Officer

University of Arkansas System Division of Agriculture
Stuttgart, Arkansas

K. Bradley Watkins (remote witness), Professor of Agricultural Economics

U.S. Rice Producers Association
Katy, Texas

Alex Clark (remote witness), member of the US Rice Producers Association Board of Directors and Missouri Rice Research & Merchandising Council

-END-

Appendix D
List of Written Submissions

Interested persons had the opportunity to file written submissions to the Commission in the course of this investigation and to provide summaries of the positions expressed in the submissions for inclusion in this report. The Commission received seven written submissions from interested persons, but none contained summaries of their positions. Below is the list of interested persons who filed written submissions during this investigation. A copy of each written submission is available in the Commission's Electronic Docket Information System (EDIS), https://www.edis.usitc.gov, by searching for submissions related to Investigation No. 332-603. In addition, the Commission held a public hearing in connection with this investigation on April 30, 2024. The full text of the transcript of the Commission's hearing is also available on EDIS.

Association for the Administration of Rice Quotas, Inc.

Embassy of Paraguay

Embassy of Uruguay

Mississippi Department of Agriculture and Commerce

Rice Exporters Association of Pakistan

Texas Department of Agriculture

USA Rice Federation

Appendix E
Economic Model

Model Overview

Chapter 8 uses an industry-specific partial equilibrium model of the global rice market to simulate the effects of country-specific policies on the industry and consumers in the United States and other major rice-producing and -consuming countries. The prospective model is calibrated to 2023 trade data with two types of rice (aromatic and nonaromatic), two stages of processing (paddy and milled rice), and 185 countries aggregated into 18 country groups (16 individual countries and two aggregate groups). The model is used to analyze the impacts of tariffs, export bans, tariff-rate quotas (TRQs), export charges, minimum support prices, and government-to-government contracts.[1588]

Table E.1 List of countries included in the rice model

Group	Countries
Individual countries in the model	Bangladesh, Brazil, Burma, Cambodia, China, India, Indonesia, Japan, Pakistan, Paraguay, Philippines, South Korea, Thailand, United States, Uruguay, Vietnam
Aggregate groups	Other developed countries, other developing countries

Source: Compiled by the USITC.

Supply Structure

In the following three sections, the subscripts i, j, k, and f denote the type of rice (aromatic or nonaromatic), exporting country, importing country, and factor input in the production of paddy rice, respectively.

The model assumes a perfectly competitive global rice market where each country produces a unique variety of rice with characteristics that differentiate it from rice produced in other countries. Four countries—India, Pakistan, Thailand, and Vietnam—produce aromatic rice in addition to nonaromatic rice and produce a unique variety of each type. The production process consists of two steps: rice farming and milling (processing). Trade can occur after either step in the production process. That is, rice can be traded as paddy rice and then processed in the destination country or processed in the source country and traded as milled rice. The supply of paddy rice in metric tons (Q_{ij}) from each country is determined by the equation below.

$$Q_{ij} = \alpha_{ij}\left(p_{ij}(1+\omega_{ij})\right)^{\theta_{ij}}$$

p_{ij} is the producer price of paddy rice type i in country j; ω_{ij} are general ad valorem production subsidies for rice type i produced in country j; and θ_{ij} is the elasticity of supply for paddy rice. The calibrated supply shift parameter (α_{ij}) captures country-specific factors for each rice type that shift the supply curve.

1588 In addition to the policies modeled in this report, the model could be used to analyze the impacts of consumption and production subsidies. These production and consumption subsidy policies are not used for counterfactual simulations because of a lack of consistent data on the value of the subsidies for the countries in the model.

In the model, eight factor inputs are used in paddy rice farming: fertilizer, pesticides, energy, water, seed, land, labor, and capital. The quantity of each factor input f used to produce one unit of paddy rice quantity (Q_{ij}) in country j is represented by g_{ijf}. The price of each unit of factor input f in country j used in the farming of rice type i is w_{ijf}. The first equation below represents each factor input's share of the total cost of production of paddy rice, where $^{F}_{f=1}\psi_{ijf} = 1$ and F is the total number of factors used in the production of paddy rice. The cost shares of factor input f in the production of paddy rice type i in country j (ψ_{ijf}) comes from the Cobb-Douglas production function for paddy rice in the second equation below.

$$\psi_{ijf} = \frac{w_{ijf}g_{ijf}}{\left(\sum_{f=1}^{F} w_{ijf}g_{ij}\right)}$$

$$Q_{ij} = A\sum_{f=1}^{F} g_{ijf}^{\psi_{ijf}}$$

In the model, the processing of paddy rice into milled rice is represented by the Leontief production function with two inputs, paddy rice (Q_{ij}) and all the value-added resources used in the milling process, K_{ij} in the equation below.

$$m_{ij} = min\{\lambda_{ij}Q_{ij}, K_{ij}\}$$

$$h_{ij} = p_{ij}Q_{ij} + \nu_{ij}K_{ij}$$

$\lambda_{ij}$is the milling quantity recovery rate for rice type i in country j, and the quantity of milled rice produced is m_{ij}. h_{ij} is the total cost of milling, and ν_{ij} is the fixed value added to paddy rice type i of milling in country j.

Demand Structure

The model has a nested constant elasticity of substitution (CES) demand structure. Consumers choose the types and sources of rice among which to allocate their total expenditure on rice. The consumers' decision is determined by maximizing their CES utility function subject to their budget constraint. The aggregate utility function for country k is represented by the following three equations where J and I are the total number of source countries and rice types, respectively.

$$max\, U_k(q_{ijk}) = \sum_{i=1}^{I}\left(\gamma_{ik}u_{ik}^{\frac{\phi-1}{\phi}}\right)^{\frac{\phi}{1-\phi}}$$

$$s.t\ \ u_{ik} = \sum_{j=1}^{J}\left(\beta_{ijk}q_{ijk}^{\frac{\sigma-1}{\sigma}}\right)^{\frac{\sigma}{1-\sigma}}$$

$$and\ \ s.t.\ E_k = \sum_{i=1}^{I}\sum_{j=1}^{J} d_{ijk}q_{ijk}$$

In the above equations, β_{ijk} is the calibrated demand preference parameter of consumers for the rice type i imported by country k from country j and γ_{ik} is the calibrated demand preference parameter for country composite rice type i in country k. σ is the elasticity of substitution between sources of each rice type i, and ϕ is the elasticity of substitution between nonaromatic and aromatic types of rice. The budget constraint for country k is that total expenditure (E_k) must equal the quantity of rice supplied (q_{ijk}) multiplied by the delivered price of rice (d_{ijk}) type i from source country j to destination country k. The delivered prices are a function of the producer prices, policy-induced price shifters, and location of paddy rice milling defined by the equation below.

$$d_{ijk} = \left((1-\mu_{ijk})\left(\frac{p_{ij}}{\lambda_{ij}} + \nu_{ij}\right) + \mu_{ijk}\left(\frac{p_{ij}}{\lambda_{ik}} + \nu_{ik}\right)\right)(1+\tau_{ijk})(1-\delta_{ik})(1+r_{ijk})(1+\xi_{ijk})$$

All policy-induced price shifters are included as ad valorem rates. τ_{ijk} is the tariff rate applied by country k to imports from country j of rice type i; δ_{ik} is the consumption subsidy in country k for rice type i; and ξ_{ijk} are the export charges applied by country j on its exports to country k of rice type i. The quota rent rate (r_{ijk}) is the cost of quota policies, including export quotas and import quotas. The quota policies cause a discrepancy between supply and demand that can result in higher prices. The quota rent rate behaves like a tariff except, instead of the government receiving revenue, the exporting producers restricted by the quota receive economic rents from higher prices. The rent rate is endogenous in the model and is required for all counterfactuals, including those that do not directly simulate changes to quota policies. All counterfactuals shift the equilibrium and affect the size of the discrepancy between supply and demand caused by the import and export quotas.

Outside of the policy-induced price shifters, delivered prices also include differences depending on where the paddy rice is processed. μ_{ijk} is the share of rice type i exported from country j to country k that is paddy rice; λ_{ij} and λ_{ik} are the milling recovery rates of rice type i for countries j and k, respectively; and ν_{ij} and ν_{ik} are the fixed milling costs of paddy rice in countries j and k, respectively.

The demand function for rice type i exported from country j to country k implied by country k's utility function is defined below.

$$q_{ijk} = E_k (Z_k)^{\eta+\phi} (P_{ik})^{\sigma-\phi} \left(d_{ijk}\right)^{-\sigma} \beta_{ijk}\gamma_{ijk}$$

The parameter η is the price elasticity of total industry demand, and the CES price index in the inner nest for the two different composite rice types in country k (P_{ik}) is represented by the following equation.

$$P_{ik} = \left(\sum_{j=1}^{J} \beta_{ijk}\left(d_{ijk}\right)^{1-\sigma}\right)^{\frac{1}{1-\sigma}}$$

The CES price index in the outer nest (Z_k), which represents the average consumer price for all rice in country k, is defined below.

$$Z_k = \left(\sum_{i=1}^{I} \gamma_{ik}(P_{ik})^{1-\phi}\right)^{\frac{1}{1-\phi}}$$

The global demand for each paddy rice type i supplied by country j is represented by the following equation, where K is the total number of importing countries.

$$G_{ij} = \sum_{k=1}^{K} \frac{q_{ijk}}{(1-\mu_{ijk})\lambda_{ij} + \mu_{ijk}\lambda_{ik}}$$

The market clearing condition is defined by the following equation.

$$G_{ij} = Q_{ij}$$

Some countries in the model have import quotas or export controls. In these cases, the bilateral trade flows that are subject to the quotas must also satisfy the market clearing conditions in the equations below. T_{ijk} are the binding TRQ quantities applied by country k to imports of rice type i from country j, and C_{ijk} are the quantitative export controls applied by country j to its exports of rice type i to country k. In certain instances (e.g., India exporting to Japan), one country has an export quota and the other has an import quota. In these cases, the model assumes that the export control is binding.[1589]

$$T_{ijk} = q_{ijk}$$

$$C_{ijk} = q_{ijk}$$

Data Description

The model uses producer prices and bilateral trade in quantities as the main inputs along with many parameters. The bilateral trade data come from the Global Trade Analytics Suite (GTAS).[1590] The 6-digit level of the *Harmonized Commodity Description and Coding System* (HS) includes four categories of rice (table E.2).

Table E.2 *Harmonized Commodity Description and Coding System* (HS) codes and descriptions for rice

HS 6-digit code	Description
100610	Rice in the husk (paddy or rough)
100620	Husked (brown) rice
100630	Semi-milled or wholly milled rice, whether or not polished or glazed
100640	Broken rice

Source: S&P Global, GTAS database, accessed August 30, 2024.

The parameter μ_{ijk}, which represents the share of total rice trade that is paddy rice (described by the HS as rice in the husk), is calculated from the trade data by dividing the quantity of trade classified under HS code 100610 in metric tons by the total rice traded. Once the share parameter is determined, all rice trade is aggregated into one HS 4-digit group (1006). Additionally, the model uses production data in combination with the trade data to calculate domestic shipments of each rice type ($q_{i,j=k,k}$). The production data come from the U.S. Department of Agriculture (USDA) Production, Supply and Distribution (PSD) Online database.[1591] Domestic shipments are calculated by subtracting each country's

[1589] In simulation 6, we do not remove the out-of-quota tariff rate to isolate the effects of strictly import tariff policies.
[1590] S&P Global, Total exports, HS heading 1006, rice, accessed August 30, 2024.
[1591] USDA, FAS, PSD Online database, “Grains,” accessed various dates.

exports from its production.[1592] Four countries examined for this report produce aromatic rice: India, Pakistan, Thailand, and Vietnam. Neither the PSD Online production data nor the HS classifications for trade data disaggregate aromatic and nonaromatic rice. To disaggregate the data, the model uses share parameters from the RiceFlow model used in the 2015 U.S. International Trade Commission (Commission) report on rice.[1593] These parameters provide the share of production in each country that is aromatic and the share of each bilateral trade flow that is aromatic.[1594] Where more recent data were available, these shares were updated using country-specific information and sources.[1595] The table below provides the aromatic share of production data that were used in the model for this report.[1596]

Table E.3 Aromatic share of production data

Country	Aromatic share of production	Source	Year of data
India	0.096	India Grains and Feed Annual Report	2023
Pakistan	0.350	RiceFlow	2013
Thailand	0.350	S&P Export Data and the Government of Thailand Office of Agricultural Economics	2023
Vietnam	0.20	United States Department of Agriculture, United States government official	2023

Source: Durand-Morat and Wailes, RiceFlow, accessed various dates; USDA, accessed various dates; Government of Thailand Office of Agricultural Economics, accessed March 2024; interview with foreign government official, accessed September 20, 2024; S&P Global, Total exports, HS heading 1006, rice, accessed August 30, 2024.

The PSD Online production data provide the production of both paddy and milled rice for each country. The milling quantity recover rates (λ_{ij} and λ_{ik}) are calculated by dividing each country's milled production by its paddy rice production.

Producer prices for nonaromatic paddy rice data come from the Food and Agriculture Organization of the United Nations (FAO) FAOSTAT database and data from the RiceFlow model.[1597] The annual producer prices of paddy rice are only available for the 2022 calendar year, so the model proxies the 2023 producer price data with the 2022 data. The table provides the prices, source, and year of data.

[1592] The annual trade data are based on the calendar year, and the production data are based on the marketing year, which varies by country. The model assumes that the marketing year dates align with the calendar year dates for all countries.
[1593] USITC, *Rice: Global Competitiveness,* 2015; Durand-Morat and Wailes, "RiceFlow: A Multi-Region, Multi-Product, Spatial Partial Equilibrium Model,", July 2010.
[1594] For countries that do not produce aromatic rice, the aromatic share of production is set to zero. For countries that do not import aromatic rice from a specific country, the aromatic share of bilateral trade is set to zero.
[1595] S&P Global, Total exports, HS heading 1006, rice, accessed August 30, 2024; Government of Thailand, Office of Agricultural Economics, *Agricultural Statistics of Thailand 2023*, March 2024; USDA, FAS, *Grain and Feed Annual: India 2024*, March 29, 2024; U.S. government official, interview by USITC staff, September 20, 2024.
[1596] The aromatic shares of each bilateral trade flow are not reported in this appendix because of the large number of shares.
[1597] FAO, FAOSTAT database, "Producer Prices," accessed various dates; Durand-Morat and Wailes, "RiceFlow: A Multi-Region, Multi-Product, Spatial Partial Equilibrium Model," July 2010.

Table E.4 Producer price of rice data

In dollars; FAO = Food and Agriculture Organization; — (em dash) = not applicable; mt = metric tons.

Trading partner	Nonaromatic producer price ($/mt)	Source nonaromatic	Year of nonaromatic data
Bangladesh	220.40	FAO/RiceFlow (imputed value)	—
Brazil	279.10	FAO	2022
Burma	179.22	FAO/RiceFlow (imputed value)	—
Cambodia	267.17	FAO/RiceFlow (imputed value)	—
China	413.10	FAO	2022
India	222.96	FAO/RiceFlow (imputed value)	—
Indonesia	392.39	FAO	2022
Japan	1413.20	FAO	2022
Pakistan	735.10	FAO	2022
Paraguay	354.00	FAO/RiceFlow (imputed value)	—
Philippines	320.10	FAO	2022
South Korea	1803.90	FAO	2022
Thailand	299.20	FAO	2022
United States	427.69	FAO	2022
Uruguay	235.00	FAO	2022
Vietnam	311.40	FAO	2022
Developed group	331.35	FAO (average of developed)	2022
Developing group	303.81	FAO (average of developing)	2022

Source: FAO, FAOSTAT database, "Producer Price", accessed various dates; USITC imputed value using data from FAO, "Producer Price," FAOSTAT database and Durand-Morat and Wailes, RiceFlow, accessed various dates.

Not all individual countries have producer prices available in the FAOSTAT database. For those without producer price data available, producer prices from the 2015 Commission report are used and scaled up by the average price increase from 2015 to 2022 for the countries where 2022 producer price data are available. The producer price of aromatic rice is calculated by scaling up the 2022 producer prices of nonaromatic rice from FAOSTAT, using the relative difference between aromatic and nonaromatic rice prices in the 2015 Commission report that used the RiceFlow model.[1598] The producer prices for the aggregated developing-country and developed-country groups are the simple average of FAO producer prices in the developed and developing countries.

On the supply side, the model uses the factor input shares of total production costs (ψ_{ijf}) as inputs. These shares are from various country-specific sources, and where no cost-of-production data more recent than 2013 are available, the cost shares from the 2015 RiceFlow model are used.[1599] The table below lists the countries, sources, and year of the cost shares used.

[1598] USITC, *Rice: Global Competitiveness,* 2015.

[1599] Kookkaew, "Cost and Return on Investment," January 2019, 91; Government of India, MAFW, "Cost of Cultivation/Production Estimates," April 6, 2024; ACA, "Costos productivos," December 2023, 30; BRRI, "Estimation of Costs and Returns," November 2023, 245; Government of Pakistan, "Rice Paddy Policy Analysis for 2022–23 Crop," accessed October 29, 2024, 13; Durand-Morat and Wailes, "RiceFlow: A Multi-Region, Multi-Product, Spatial Partial Equilibrium Model of the World Rice Economy," July 2010; Fakkhong and Suwanmaneepong, "Determinants of Profitability of Rice Farming in Peri-Urban Area, Bangkok, Thailand," 2016; 통계청 [Statistics Korea], "2023 년산 논벼(쌀) 생산비조사 결과 [Results of the 2023 Rice Paddy Production Cost Survey]," December 12, 2024; MAFF, "農産物生産費統計 [Agricultural Production Cost Statistics]," December 12, 2024; Khoiriyah et al., "Analyzing The Cost of Paddy Rice Labor in Indonesia," August 19, 2023, 195–198; USDA, ERS and NASS, "Agricultural Resource Management Survey (ARMS)," accessed August, 2024.

Table E.5 Sources and year of most recent cost shares of production data

Trading partner	Source	Year
Bangladesh	RiceFlow	2013
Brazil	RiceFlow	2013
Burma	RiceFlow	2013
Cambodia	RiceFlow	2013
China	RiceFlow	2013
India	Government of India	2021
Indonesia	Khoiriyah et al. (2023)	2023
Japan	Government of Japan Ministry of Agriculture, Forestry and Fisheries	2024
Pakistan	Government of Pakistan	2022
Paraguay	RiceFlow	2013
Philippines	RiceFlow	2013
South Korea	Statistics Korea	2024
Thailand	Fakkong and Suwanmaneepong (2016)	2016
United States	United States Department of Agriculture	2023
Uruguay	Asociación Cultivadores de Arroz	2023
Vietnam	RiceFlow	2013
Developed Group	RiceFlow	2013
Developing Group	RiceFlow	2013

Source: Durand-Morat, Alvaro and Weiles, RiceFlow, accessed various dates; USDA, ARMS, accessed August, 2024; Government of India, "Cost of Cultivation/Production Estimates," accessed April 6, 2024; Government of Pakistan, "Rice Paddy Policy Analysis for 2022–23 Crop," accessed October 29, 2024, Fakkong and Suwanmaneepong (2016), "Determinants of Profitability of Rice Farming in Peri-Urban Area, Bangkok, Thailand," accessed various dates; Asociación Cultivadores de Arroz, "Costos productivos," accessed various dates.

The model contains five elasticity values: the Armington elasticity of substitution between country sources within the two rice composites (σ), elasticity of substitution between the two rice composites (ϕ), elasticity of total industry demand (η), elasticity of supply for paddy rice (θ_{ij}), and the price elasticity of supply for land (ϵ_{ij}). The elasticity values are listed in the table below.

Table E.6 Elasticity estimates

Elasticity	Value	Source
σ	5	GTAP
ϕ	3	Commission estimate, assuming the elasticity of substitution between composites will be less than within composites
η	−1	Commission estimate
ϵ_{ij}	0.5	Commission estimate
θ_{ij}	Varies	Calibrated by the model in the section below

Source: Aguiar, A., Chepeliev, M., Corong, E., & van der Mensbrugghe, D. (2023). "The Global Trade AnalysisProject (GTAP) Data Base: Version 11," accessed August 2023.

The model also uses tariff data from the United Nations Conference on Trade and Development Trade Analysis Information System accessed through the World Integrated Trade Solution database.[1600] Average tariff levels between pairs of countries are computed as a simple average of the ad valorem equivalent tariffs for all *Harmonized Tariff Schedule of the United States* (HTS) 8-digit products relating to rice.[1601]

[1600] WITS database, "Tariff-View and Export Raw Data," accessed August 16, 2024.
[1601] As a robustness check, tariffs were also computed as a trade-weighted average of the rates between two countries. The use of this alternative tariff computation method did not have any noticeable impact on results.

Most-favored-nation tariff rates are used by default, but in cases where two countries have a trade agreement, the preferential rate is used instead.

The tariff rates used for the developed- and developing-country groups are the trade-weighted average of the tariff rates for the countries included in the groups. These tariff rates are in turn calculated as a simple average of tariffs applied by a given developed or developing country at the HTS 8-digit level. For the European Union and Colombia, which have TRQ policies, ad valorem equivalent rates are calculated by computing the total revenue from out-of-quota imports and dividing this revenue by the total value of imported rice.

The TRQ information used for Japan in the model comes from USDA Global Agricultural Information Network reports.[1602] The model does not use current production subsidies because of a lack of concrete data for countries included in the model. The information on India's export ban and government-to-government contracts comes from governmental notices.[1603]

For the quantitative assessment of food security, the model produces the change in daily caloric intake using the change in quantity of rice consumption. The model uses this change to calculate the percentage change in the USDA Economic Research Service calorie gap index for the individual developing countries in the model and the developing-country aggregate group.[1604]

Model Calibration

The model uses the baseline data and exogenous parameters described in the section above to calibrate some of the supply and demand parameters and elasticities. The factor input cost shares of production, including the cost share of land rents (χ_{ij}), are exogenous and remain constant. Additionally, all elasticities are exogenous and remain constant in the model, other than the elasticity of supply for paddy rice, which is calibrated according to the following equation. ϵ_{ij} is the elasticity of supply of land for paddy rice production.

$$\theta_{ij} = \frac{1 - \chi_{ij} + \epsilon_{ij}\chi_{ij}}{\chi_{ij}}$$

In the following equations, the superscript "$*$" denotes initial values. The supply initial shift parameter (α^*_{ij}) is calibrated according to the equation below.

$$\alpha^*_{ij} = q^*_{ij}\left(p^*_{ij}\left(1 + \omega^*_{ij}\right)\right)^{-\theta_{ij}}$$

The model uses initial delivered prices, which are a function of data inputs, including the producer prices, milling quantity recovery rates and costs, and the costs imposed by government policies, to calibrate the inner nest demand shift parameter (β_{ijk}).

1602 USDA, FAS, *Japan: Grain and Feed Annual*, March 20, 2024.
1603 Kumar Sarangi, written letter to the government of India, Ministry of Commerce and Industry, October 18, 2023.
1604 USDA, FAS, "Global Food Security Snapshot," accessed various dates.

$$\beta_{ijk} = \frac{\left(\frac{d^*_{ijk}}{d^*_{i,j=k,k}}\right)^{\sigma} q^*_{ijk}}{q^*_{i,j=k,k}}$$

Countries in the model do not always have domestic production for aromatic rice. When this is the case, the demand shift parameter above becomes undefined. In these cases, the model normalizes the demand shift parameter around aromatic rice imports from India rather than the domestic shipments of aromatic rice, which would be zero for countries with no aromatic rice production.

The outer nest demand shift parameter is calibrated according to the following equation. Subscripts "$i = n$" and "$i = a$" denote nonaromatic and aromatic rice types, respectively.

$$\gamma_{ik} = \frac{\left(\sum_{j=1}^{J} v^*_{i=a,jk}\right)\left(\frac{P^*_{i=a,k}}{P^*_{i=n,k}}\right)^{\phi-1}}{\sum_{j=1}^{J} v^*_{i=n,jk}}$$

The aggregate expenditure on rice by each country k is calibrated using the equation below. The model assumes that expenditure on rice remains constant.

$$E_k = q^*_{ijk} (Z^*_k)^{-\eta-\phi} \left(P^*_{i=n,k}\right)^{\phi-\sigma} \left(d^*_{i=n,j=k,k}\right)^{\sigma}$$

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Appendix F
Data for Figures

Table F.1 Food and Agriculture Organization of the United Nations (FAO) rice prices indexes, 2018–24.
Price index (2014-16) = 100. This table corresponds to ES.1 and figure 2.10.

Year	Month	Indica	Aromatic	Japonica	Glutinous	All FAO
2018	January	109	111	95	94	106
2018	February	110	113	97	98	108
2018	March	110	113	91	91	108
2018	April	113	112	92	88	109
2018	May	114	113	93	92	108
2018	June	113	114	95	89	111
2018	July	107	107	95	81	108
2018	August	106	105	89	83	106
2018	September	104	102	89	87	105
2018	October	104	101	86	88	102
2018	November	102	104	84	88	102
2018	December	102	102	82	90	102
2019	January	102	102	83	97	106
2019	February	99	101	83	99	105
2019	March	100	101	81	99	105
2019	April	101	103	81	104	105
2019	May	100	109	81	112	105
2019	June	99	109	78	114	106
2019	July	100	108	78	119	106
2019	August	102	111	79	154	108
2019	September	101	112	79	153	108
2019	October	102	110	80	154	104
2019	November	101	107	81	145	102
2019	December	101	103	83	141	102
2020	January	103	110	85	144	103
2020	February	106	97	86	137	104
2020	March	110	95	88	128	106
2020	April	120	100	93	132	115
2020	May	120	104	94	134	116
2020	June	118	102	93	133	114
2020	July	115	95	93	126	110
2020	August	118	100	93	128	110
2020	September	116	98	90	123	112
2020	October	114	96	86	101	109
2020	November	115	94	88	99	109
2020	December	119	93	89	102	111
2021	January	123	92	94	101	114
2021	February	125	92	97	101	116
2021	March	122	90	98	97	114
2021	April	119	88	97	93	111
2021	May	119	88	99	91	111
2021	June	115	88	102	89	108
2021	July	107	84	104	82	101
2021	August	103	82	103	77	101
2021	September	104	83	103	78	99
2021	October	105	85	105	79	100
2021	November	104	86	108	80	100
2021	December	102	85	109	81	98
2022	January	104	90	113	89	101

Year	Month	Indica	Aromatic	Japonica	Glutinous	All FAO
2022	February	105	92	114	87	103
2022	March	106	91	117	84	103
2022	April	108	96	120	85	106
2022	May	111	103	125	90	109
2022	June	112	106	127	85	111
2022	July	109	107	128	82	108
2022	August	108	110	129	85	108
2022	September	112	107	135	84	111
2022	October	113	106	140	92	112
2022	November	115	107	146	97	115
2022	December	120	110	159	103	119
2023	January	127	120	161	101	126
2023	February	126	117	158	99	125
2023	March	123	112	146	96	121
2023	April	127	113	150	96	124
2023	May	131	116	147	98	128
2023	June	130	113	142	97	126
2023	July	135	111	140	100	130
2023	August	151	115	140	114	130
2023	September	152	113	124	119	142
2023	October	149	113	113	113	139
2023	November	150	110	111	105	139
2023	December	154	107	110	105	141
2024	January	156	108	110	107	143
2024	February	154	105	110	105	141
2024	March	152	104	105	102	138
2024	April	148	103	103	102	136
2024	May	151	103	104	104	137
2024	June	150	103	99	106	137
2024	July	145	103	97	107	133
2024	August	145	106	96	108	134

Source: Food and Agriculture Organization of the United Nations (FAO). “FAO Rice Price Update.” Accessed September 5, 2024.
Note: The All FAO index is based on 21 rice export quotes. The Indica index is based on the following prices: Argentina 5%, Brazil 5%, India parboiled 5%, Pakistan 5%, Thai 100% B white, Thai parboiled 100%, Uruguay 5% (long grain white rice), U.S. #2 4% (long grain white rice), Pakistan 25%, Thai 25%, Thai 1A Super (white broken rice), Pakistan 25%. The aromatic index is based on the following prices: Cambodia fragrant 5%, India Pusa basmati, Pakistani basmati, Thai fragrant (Hom Mali jasmine rice, grade A), Vietnam fragrant. The japonica index is based on the following prices: U.S. medium grain #1 4% (California Calrose). The glutinous index is based on the following prices: Thai glutinous 10%, Vietnam glutinous 10%. Within each variety, a simple average of the relative quote prices is calculated, then the average relative prices of each of the varieties are combined by weighing them with their trade shares.

Table F.2 Share of global milled rice production volume, by region, average for marketing years 2018/19–2023/24

In percentages. This table corresponds to figure 2.1.

Region	Share (%)
Asia	89.2
Africa	4.8
North America	1.3
South America	3.2
All other	1.5
Total	100.0

Source: USDA, FAS, PSD Online database, accessed December 28, 2024.

Note: All other includes the Middle East and the European Union, both of which account for less than 0.5 percent of global rice production. Totals based on period average.

Table F.3 Share of global milled rice consumption volume, by region, average for marketing years 2018/19–2023/24

In percentages. This table corresponds to figure 2.2.

Region	Share (%)
Asia	84.1
Middle East	1.9
South America	2.9
Africa	8.0
North America	1.2
European Union	0.7
All other	1.2
Total	100.0

Source: USDA, FAS, PSD Online database, accessed December 28, 2024.

Note: All other includes the former Soviet Union, Caribbean, Central America, and Oceania. Individually, these regions account for less than 0.5 percent of global rice production. Totals based on period average.

Table F.4 Rice yields, selected countries, average 2018/19—2023/24

In metric tons per hectare. This table corresponds to figure 2.3.

Country	Yield
Australia	9.9
Uruguay	9.0
Egypt	8.5
United States	8.5
China	7.1
South Korea	6.9
Brazil	6.7
Paraguay	6.6
Mexico	6.5
Vietnam	6.0
Indonesia	4.7
World	4.6
Bangladesh	4.6
Niger	4.3
India	4.2
Philippines	4.1
Benin	3.8
Pakistan	3.8
Cambodia	3.2
Laos	3.2
Burma	2.8
Thailand	2.8
Côte d'Ivoire	2.5
Nigeria	2.4
Haiti	2.0
Sierra Leone	1.8
Angola	1.2
Gambia	0.6

Source: USDA, FAS, PSD Online database, accessed December 28, 2024.

Table F.5 Per capita consumption by region, average for marketing years 2018/19 and 2023/24

In kilograms per person. This table corresponds to figure 2.4.

Region	2018/19	2023/24
European Union	7.3	7.3
North America	12.1	12.7
North Africa	23.0	21.3
Sub-Saharan Africa	30.8	30.6
Middle East	34.7	36.0
South America	38.0	37.1
World	63.3	64.9
South Asia	79.1	85.8
East Asia	98.2	100.5
Southeast Asia	158.6	157.7

Source: USDA, FAS, PSD Online database, accessed December 28, 2024.

Table F.6 Share daily per capita calories available for consumption from rice, by region, average 2018–22
In percentages. This table corresponds to figure 2.5.

Region	Share (%)
Southeast Asia	41.8
South Asia	25.6
East Asia	25.0
World	17.5
Caribbean	16.4
Middle East	9.2
South America	8.5
Sub-Saharan Africa	4.8
North Africa	4.7
Oceania	4.5
Central America	3.4
North America	2.0
European Union	1.4

Source: Food and Agriculture Organization of the United Nations (FAO), FAOSTAT database, "Food Balances."

Table F.7 Rice ending stocks, by region, for marketing years 2018/19–2023/24
In millions of metric tons. This table corresponds to figure 2.6.

Region	2018/19	2019/20	2020/21	2021/22	2022/23	2023/24
East Asia	119	120	120	117	110	106
South Asia	32	37	41	39	40	46
Southeast Asia	15	14	16	16	18	15
All other	11	11	12	12	12	12
Total	177	183	189	184	181	179

Source: USDA, FAS, PSD Online database, accessed December 28, 2024.

Table F.8 Major global rice trade flows, marketing year 2023
In 1,000 metric tons. This table corresponds to figure 2.7.

Exporter	Importer	2023
India	Middle East	4,386
India	West Africa	5,821
India	China	183
India	European Union	473
India	United States	280
Thailand	Indonesia	1,411
Thailand	Middle East	1,142
Thailand	South Africa	885
Thailand	United States	706
Thailand	China	472
Vietnam	West Africa	1,117
Vietnam	Indonesia	119
Vietnam	China	851
Vietnam	Philippines	3,215
Vietnam	Malaysia	438
Pakistan	Middle East	521
Pakistan	West Africa	484
Pakistan	Indonesia	374
Pakistan	Malaysia	372
United States	Middle East	361
United States	Central America	528
United States	Japan	267
United States	Mexico	538
Brazil	West Africa	350
Brazil	Mexico	312
Brazil	Central America	298
Uruguay	Brazil	298
Paraguay	Brazil	685

Source: S&P Global, Total exports, HS heading 1006, rice, accessed August 2, 2024.

Table F.9 Regional share of global rice exports in marketing years 2018/19 and 2023/24
In percentages. This table corresponds to figure 2.8.

Region	2018/29 (%)	2023/24 (%)
Southeast Asia	44.7	41.5
South Asia	37.1	33.7
South America	6.3	7.8
North America	5.6	6.8
East Asia	3.5	6.7
All other	2.8	3.4
Total	100.0	100.0

Source: USDA, FAS, PSD Online database, accessed December 28, 2024.

Table F.10 Regional share of global rice imports in marketing years 2018/19 and 2023/24
In percentages. This table corresponds to figure 2.9.

Region	2018/19 (%)	2023/24 (%)
South Asia	3.0	1.7
South America	4.5	3.7
European Union	4.1	4.0
North America	4.8	5.2
East Asia	10.7	6.1
Middle East	15.7	14.7
Southeast Asia	14.7	27.6
Africa	34.9	30.2
All other	7.6	6.7
Total	100.0	100.0

Source: USDA, FAS, PSD Online database, accessed December 28, 2024.
Note: The All FAO index is based on 21 rice export quotes. The Indica index is based on the following prices: Argentina 5%, Brazil 5%, India parboiled 5%, Pakistan 5%, Thai 100% B white, Thai parboiled 100%, Uruguay 5% (long grain white rice), U.S. #2 4% (long grain white rice), Pakistan 25%, Thai 25%, Thai 1A Super (white broken rice), Pakistan 25%. The aromatic index is based on the following prices: Cambodia fragrant 5%, India Pusa basmati, Pakistani basmati, Thai fragrant (Hom Mali jasmine rice, grade A), Vietnam fragrant. The japonica index is based on the following prices: U.S. medium grain #1 4% (California Calrose). The glutinous index is based on the following prices: Thai glutinous 10%, Vietnam glutinous 10%. Within each variety, a simple average of the relative quote prices is calculated, then the average relative prices of each of the varieties are combined by weighing them with their trade shares.

Table F.11 Prices of crude oil and urea, 2018–24

Dollars per barrel and dollars per metric ton. This table corresponds to figure 3.2.

Year	Quarter	Average crude oil ($/barrel)	Urea ($/mt)
2018	Q1	65	228
2018	Q2	71	226
2018	Q3	73	260
2018	Q4	64	284
2019	Q1	61	253
2019	Q2	65	248
2019	Q3	60	255
2019	Q4	60	226
2020	Q1	49	220
2020	Q2	30	213
2020	Q3	42	238
2020	Q4	44	245
2021	Q1	59	318
2021	Q2	67	351
2021	Q3	72	436
2021	Q4	78	829
2022	Q1	97	821
2022	Q2	110	774
2022	Q3	96	623
2022	Q4	85	581
2023	Q1	79	372
2023	Q2	77	310
2023	Q3	85	367
2023	Q4	82	384
2024	Q1	81	339
2024	Q2	84	314
2024	Q3	78	341

Source: World Bank, "Pink Sheet Data," accessed October 15, 2024.

Note: Crude oil (U.S. dollars per barrel) left axis. Urea (dollars per metric tons) right axis.

Table F.12 United States: Exports of rice, by type, 2018–23

In thousands of metric tons (1,000 mt). This table corresponds to figure 4.1.

Type	2018	2019	2020	2021	2022	2023
Paddy	1,354	1,603	1,374	1,500	958	1,206
White long grain	776	823	649	764	665	773
White medium grain	550	666	652	634	406	403
Parboiled white long grain	191	204	182	178	157	140
Brown medium grain	96	164	171	98	157	140
White short grain	80	45	86	77	59	53
Broken	60	63	59	53	40	40
Brown long grain	43	33	70	61	65	40
All other	41	41	49	47	44	50
Total	3,176	3,628	3,276	3,395	2,473	2,737

Source: USITC DataWeb/Census, accessed August 2024.

Table F.13 United States: imports of rice, by type, 2021–23

In thousands of metric tons (1,000 mt). This table corresponds to figure 4.2.

Type	2021	2022	2023
White long grain jasmine	365	490	508
White long grain basmati	148	210	237
White medium grain	105	156	171
Nonaromatic white long grain	171	210	193
Broken	27	34	48
White short grain	40	76	55
All other types	101	121	126
Total	957	1,296	1,338

Source: USITC DataWeb/Census, accessed August 2024.

Table F.14 India: exports of rice, by type and form, 2018–23

In thousands of metric tons (1,000 mt). This table corresponds to figure 5.1.

Year	Parboiled	Basmati	Non-basmati	Broken rice	Other rice
2009	56	1,994	77	1	24
2010	49	2,126	42	0	12
2011	1,393	2,798	352	166	43
2012	4,551	3,396	1,367	866	371
2013	4,094	3,783	1,536	944	234
2014	4,068	3,583	2,762	932	242
2015	3,666	4,214	1,952	1,186	216
2016	3,667	3,885	1,682	740	124
2017	4,564	3,989	2,655	1,238	181
2018	3,598	4,007	2,759	1,383	260
2019	3,404	4,396	1,503	319	269
2020	4,701	4,993	3,356	1,189	478
2021	7,923	3,995	5,123	3,619	817
2022	7,467	4,400	6,007	3,895	477
2023	7,496	4,904	3,920	971	568

Source: S&P Global, Total exports, Indian tariff rate lines 1006.30.20 (basmati), 1006.30.10 (parboiled white rice), 1006.30.90 (non-basmati white rice) and HS 1006.10 (paddy/rough rice), 1006.20 (brown rice), 1006.40 (broken rice)," accessed August 11, 2024.

Table F.15 India: exports of rice, by type and form with noted export restrictions, January 2022–July 2024

In thousands of metric tons (1,000 mt). This table corresponds to figure 5.2.

Year	Month	Basmati	Non-basmati	Parboiled	Broken	Other
2022	January	347,597	422,729	549,533	354,988	80,996
2022	February	394,263	488,714	583,350	495,383	53,470
2022	March	460,336	515,346	619,760	463,489	47,377
2022	April	319,853	351,730	546,981	423,260	30,875
2022	May	365,689	374,156	522,661	411,932	18,342
2022	June	439,782	428,992	653,493	572,017	14,489
2022	July	380,353	460,805	602,706	392,665	9,281
2022	August	369,975	569,876	836,496	364,079	8,346
2022	September	280,117	440,124	699,270	218,053	2,113
2022	October	253,923	610,183	612,509	30,703	2,362
2022	November	322,508	627,227	593,640	67,204	70,969
2022	December	465,463	716,937	646,956	101,673	138,767
2023	January	457,877	557,311	640,717	89,807	103,084
2023	February	444,682	561,734	743,124	166,625	58,087
2023	March	458,751	699,710	747,334	210,424	36,266
2023	April	425,418	604,485	689,114	90,542	35,048
2023	May	405,438	544,733	648,601	195,371	38,293
2023	June	341,785	404,517	683,813	84,630	38,309
2023	July	436,765	381,249	732,471	104,419	82,499
2023	August	400,704	39,978	1,018,147	13,203	26,322
2023	September	297,594	89,651	318,609	6,277	10,944
2023	October	300,665	15,698	403,728	4,678	12,326
2023	November	386,023	8,374	334,835	4,308	26,910
2023	December	548,435	12,644	535,811	1,201	99,679
2024	January	562,175	28,537	645,735	2,127	108,969
2024	February	574,477	90,557	761,771	3,663	98,284
2024	March	562,571	138,668	798,119	34,824	63,866
2024	April	499,575	130,862	641,295	54,767	51,222

Source: S&P Global, Total exports, HS heading 1006, rice, accessed August 11, 2024.

Table F.16 India: rice production by state, five-year average, marketing years 2017/18–2021/22
In thousands of metric tons (1,000 mt). This table corresponds to figure 5.3.

State	2017/18–2021/22
West Bengal	16,069
Uttar Pradesh	15,026
Punjab	12,730
Telangana	8,597
Orissa	8,149
Andhra Pradesh	8,141
Bihar	7,002
Tamil Nadu	6,946
Chhattisgarh	6,683
Assam	5,017
Haryana	4,581
Madhya Pradesh	4,525
Karnataka	3,739
Maharashtra	3,159
Jharkhand	3,134
Gujarat	2,007
Tripura	806
Uttaranchal	671
Kerala	565
Jammu and Kashmir	558
Manipur	513
Rajasthan	499
Nagaland	318
Meghalaya	281
Arunachal Pradesh	244
Himachal Pradesh	136
Goa	94
Mizoram	61
Puducherry	54
Dādra and Nagar Haveli and Damān and Diu	35
Delhi	18
Sikkim	17
Andaman and Nicobar	15
Chandigarh	1
Ladakh	0
Lakshadweep	0
Total	120,389

Source: Government of India, Ministry of Agriculture and Farmers Welfare, Economics and Statistics Division, May 2023.

Table F.17 Public stock procurement, distribution, ending stocks, and share of procurement to total rice production, marketing years 2016/17–2022/23
In millions of metric tons (million mt) and percentages (%). This table corresponds to figure 5.4.

Program	2017	2018	2019	2020	2021	2022	2023
Purchases under the program (million mt)	38	38	44	52	60	59	54
Distribution under the program (million mt)	35	34	34	51	47	62	50
Ending balance of stocks (million mt)	17	20	28	25	35	28	31
PSH purchase share of total production (%)	34.6	33.8	38.1	43.9	49.1	45.5	39.8

Source: Staff calculation; WTO, Committee on Agriculture, "Notification of Domestic Support: India," March 31, 2023; WTO, Committee on Agriculture, "Notification of Domestic Support: India," April 2, 2024.

Table F.18 Pakistan: rice production by province, 2022–23

In thousands of metric tons (1,000 mt). This table corresponds to figure 5.5.

State	2022/23
Punjab	5,766
Sindh	2,631
Balochistan	525
Khyber Pakhtunkhwa	156
Gilgit Balistan	0
Azad Kashmir	0
Islamabad Capital Territory	0
Total	9,076

Source: Government of Pakistan, Agriculture Policy Institute, Ministry of National Food Security and Research, *Rice Paddy Policy Analysis for 2022–23 Crop*, July 2022, 29.

Table F.19 Bangladesh: rice production by division, marketing year 2022/23

In thousands of metric tons (1,000 mt). This table corresponds to figure 5.6.

District	2022/23
Rangpur	6,707
Rajshahi	6,538
Khulna	5,334
Chittagong	5,239
Dhaka	4,758
Mymensingh	4,429
Sylhet	3,568
Barishal	2,522
Total	39,095

Source: Government of Bangladesh, Bangladesh Bureau of Statistics, *Bangladesh Agricultural Yearbook: 2023*, June 2024

Table F.20 Vietnam: rice production by province, 2023

In thousands of metric tons (1,000 mt). This table corresponds to figure 6.1.

Province	2023
Kien Giang	4,484
An Giang	4,006
Dong Thap	3,280
Long An	2,971
Soc Trang	2,060
Thanh Hoa	1,389
Can Tho	1,364
Hau Giang	1,220
Bac Lieu	1,218
Tra Vinh	1,084
Nghe An	999
Thai Binh	986
Ha Noi	946
Nam Dinh	870
Tay Ninh	815
Tien Giang	815
Dak Lak	796
Binh Thuan	743
Hai Duong	687
Vinh Long	678
Binh Dinh	636

Province	2023
Ha Tinh	569
Bac Giang	561
Ca Mau	556
Quang Nam	452
Quang Ngai	440
Ninh Binh	439
Gia Lai	402
Bac Ninh	384
Thai Nguyen	380
Phu Yen	375
Hai Phong	363
Ha Nam	362
Phu Tho	346
Hung Yen	327
Dong Nai	311
Thua Thien-Hue	301
Vinh Phuc	297
Ninh Thuan	285
Quang Binh	276
Quang Tri	263
Khanh Hoa	262
Tuyen Quang	259
Yen Bai	220
Hoa Binh	218
Ha Giang	217
Lang Son	214
Dien Bien	209
Son La	208
Quang Ninh	192
Lao Cai	185
Lai Chau	153
Ba Ria - Vung Tau	144
Cao Bang	140
Lam Dong	140
Bac Kan	115
Ben Tre	110
Kon Tum	99
Ho Chi Minh city	85
Dak Nong	82
Binh Phuoc	41
Da Nang	28
Binh Duong	25
Total	45,103

Source: Compiled by the USITC. General Statistics Office of Vietnam, “Production of Paddy by Province by Cities,” accessed October 31, 2024.

Table F.21 Thailand: rice production by province, 2023

In thousands of metric tons (1,000 mt). This table corresponds to figure 6.2.

Province	**2023**
Nakhon Sawan	1,722
Ubon Ratchathani	1,478
Suphan Buri	1,446
Phichit	1,350
Phitsanulok	1,276
Nakhon Ratchasima	1,270
Roi Et	1,077
Si Sa Ket	1,054
Surin	1,034
Phra Nakhon Si Ayutthaya	1,030
Kamphaeng Phet	1,015
Buri Ram	980
Chiang Rai	935
Sukhothai	870
Chai Nat	782
Maha Sarakham	779
Khon Kaen	766
Sakon Nakhon	728
Udon Thani	721
Kalasin	692
Phetchabun	651
Chaiyaphum	617
Lop Buri	615
Chachoengsao	563
Uttaradit	550
Nakhon Phanom	521
Yasothon	506
Uthai Thani	429
Ang Thong	396
Nakhon Pathom	368
Amnat Charoen	366
Pathum Thani	357
Sing Buri	344
Phayao	337
Kanchanaburi	335
Chiang Mai	322
Nakhon Nayok	301
Saraburi	294
Phetchaburi	286
Nong Khai	274
Ratchaburi	257
Lampang	248
Prachin Buri	239
Nong Bua Lam Phu	238
Sa Kaeo	228
Mukdahan	181
Phrae	179
Nan	172
Tak	158

Province	2023
Bueng Kan	152
Loei	142
Nonthaburi	112
Bangkok Metropolis	103
Songkhla	101
Mae Hong Son	88
Nakhon Si Thammarat	82
Lamphun	72
Phatthalung	60
Chon Buri	51
Pattani	40
Samut Prakan	21
Prachuap Khiri Khan	20
Narathiwat	12
Rayong	6
Trat	6
Surat Thani	6
Yala	6
Satun	5
Samut Sakhon	4
Chanthaburi	4
Trang	3
Samut Songkhram	2
Krabi	2
Chumphon	1
Phangnga	1
Ranong	0
Phuket	0
Phatthaya	0
Total	32,437

Source: Compiled by the USITC. Government of Thailand, Office of Agricultural Economics, Agricultural Statistics of Thailand 2023, March 2024.

Table F.22 China: rice production by province, 2022

In thousands of metric tons (1,000 mt). This table corresponds to figure 6.3.

Province	2022
Heilongjiang Province	27,180
Hunan Province	26,399
Jiangxi Province	20,365
Jiangsu Province	19,916
Hubei Province	18,658
Anhui Province	15,834
Sichuan Province	14,623
Guangdong Province	11,086
Guangxi Zhuang Autonomous Region	10,281
Jilin Province	6,809
Yunnan Province	4,647
Henan Province	4,792
Chongqing Municipality	4,852
Zhejiang Province	4,629
Liaoning Province	4,256
Guizhou Province	3,950
Fujian Province	3,938
Hainan Province	1,279
Inner Mongolia Autonomous Region	902
Shandong Province	906
Shanghai Municipality	827
Shanxi Province	733
Tianjin Municipality	526
Hebei Province	489
Xinjiang Uygur Autonomous Region	346
Ningxia Hui Autonomous Region	237
Gansu province	15
Shaanxi Province	15
Tibet Autonomous Region	5
Beijing Municipality	2
Qinghai Province	0
Hong Kong Special Administrative Region	0
Macao Special Administrative Region	0
Total	208,495

Source: Compiled by the USITC. Government of China, National Bureau of Statistics of China, "Agriculture - Output of Major Farm Products," accessed September 30, 2024.

Table F.23 Indonesia: rice production by province, 2024

In thousands of metric tons (1,000 mt). This table corresponds to figure 6.4.

Province	2024
Jawa Timur	8,372
Jawa Tengah	8,013
Jawa Barat	7,727
Sulawesi Selatan	4,353
Sumatera Selatan	2,579
Lampung	2,477
Sumatera Utara	1,955
Aceh	1,491
Banten	1,383
Nusa Tenggara Barat	1,319
Sumatera Barat	1,227
Kalimantan Selatan	889
Kalimantan Barat	726
Sulawesi Tengah	690
Nusa Tenggara Timur	641
Bali	588
Sulawesi Tenggara	502
Yogyakarta	412
Kalimantan Tengah	343
Sulawesi Barat	293
Jambi	264
Bengkulu	247
Sulawesi Utara	241
Kalimantan Timur	208
Riau	205
Gorontalo	199
Maluku	81
Bangka-Belitung	69
Maluku Utara	35
North Kalimantan	31
Papua Barat	19
Papua	4
Kepulauan Riau	0
Total	47,583

Source: Compiled by the USITC. Government of Indonesia, BPS-Statistics Indonesia, "Harvested Area, Productivity, and Production of Paddy by Province - Statistical Data," October 15, 2024.

Table F.24 Major export flows from top exporters in South America, 2023

In thousands of metric tons (1,000 mt). This table corresponds to figure 7.1.

Exporter	Importer	2023
Brazil	Peru	55
Brazil	Venezuela	219
Brazil	Mexico	312
Brazil	Central America	298
Paraguay	Brazil	685
Paraguay	Chile	121
Paraguay	Central America	45
Uruguay	Brazil	298
Uruguay	Venezuela	93
Uruguay	Peru	74
Uruguay	Mexico	78
Uruguay	Central America	158

Source: S&P Global, Total exports, HS heading 1006, rice, accessed September 24, 2024.

Note: this map only displays major trade flows for exports originating in Brazil, Paraguay, and Uruguay.

Table F.25 Brazil: rice production by state, marketing year 2022/23

In thousands of metric tons (1,000 mt). ** = rounds to zero. This table corresponds to figure 7.2.

State	2022/23
Rio Grande do Sul	8255
Santa Catarina	1221
Tocantins	768
Mato Grosso	474
Maranhão	197
Goiás	156
Rondônia	152
Paraná	148
Pará	125
Piauí	101
Roraima	100
Minas Gerais	99
Mato Grosso do Sul	70
São Paulo	56
Sergipe	46
Amazonas	22
Alagoas	20
Ceará	20
Acre	5
Paraíba	4
Distrito Federal	3
Rio Grande de Norte	2
Pernambuco	2
Amapá	1
Rio de Janeiro	1
Espírito Santo	**
Bahia	**
Total	12,047

Source: Government of Brazil, Companhia Nacional de Abastecimento (CONAB), "Portal de Informações Agropecuárias [Agricultural Information Portal]," accessed various dates.

Table F.26 Uruguay: rice production zones, marketing year 2022/23

In thousands of hectare (1,000 ha). ** = rounds to zero. This table corresponds to figure 7.3.

Production zone	2022/23
Treinta y Tres	51
Rocha	39
Cerro Largo	27
Artigas	23
Tacuarembó	10
Salto	8
Rivera	6
Lavalleja	3
Paysandú	**
Río Negro	**
Durazno	**
Maldonado	**
Canelones	**
Montevideo	**
San José	**
Colonia	**
Soriano	**
Flores	**
Florida	**
Total	168

Source: Government of Paraguay. Ministry of Agriculture and Livestock.

Table F.27 Paraguay: rice production by department, marketing year 2022/23

In thousands of metric tons (1,000 mt). ** = rounds to zero. This table corresponds to figure 7.4.

Department	2022/23
Itapúa	281
Misiones	219
Ñeembucú	126
Paraguarí	83
Presidente Hayes	59
Central	32
Caazapá	27
San Pedro	27
Cordillera	25
Guairá	5
Caaguazú	**
Alto Paraguay	**
Alto Paraná	**
Concepción	**
Boquerón	**
Canindeyú	**
Amambay	**
Asunción	**
Total	885

Source: Government of Uruguay, Ministerio de Ganadería, Agricultura y Pesca, “Relevamiento de chacras de arroz zafra 2022/2023,” accessed November 1, 2024.

Table F.28 United States: rice exports, by trade partners and type, 2023

In thousands of metric tons. This table corresponds to figure 9.1.

Trade partner	Paddy	Long grain white	Medium grain white	Other
South Korea	0	0	11	32
Jordan	0	14	33	1
Colombia	152	0	1	1
Canada	0	49	38	128
Iraq	0	219	0	0
Japan	0	0	262	5
Haiti	0	370	0	5
CAFTA-DR partners	466	38	2	1
Mexico	453	37	14	34

Source: USITC DataWeb/Census based on HS subheadings and Schedule B numbers under HS subheading 1006.