



Ca' Foscari
University
of Venice

Master's Degree Programme

In Global Development and Entrepreneurship

Final Thesis

Global Market Dynamics and Thai Jasmine Rice: Production, Exports, and Farmers

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Academic Year

2024/2025

Abstract

Jasmine rice (or Hom Mali) rice is one of Thailand's valuable agriculture exports. It is one of the significant portions for the country's commodity economy, its rice has unique quality and represents a symbol of Thailand national identity. In recent years, the global market of rice has been increasingly dynamic, presenting Thai farmers with challenges such intensified international competition, fluctuating export rice prices, rising production costs, and limited technological access. These factors directly influenced Thailand's production and export strategies. This thesis examines the impact of global market dynamics on Thailand's Jasmine rice sector and explores strategies to strengthen its competitiveness. The study employed a quantitative methodology based on primary data collected through surveys conducted with 100 Jasmine rice farmers in Northeast Thailand and the secondary data, including export statistics and information from international sources. The findings suggest that Thai Jasmine rice retains strong global demand due to its premium quality, however, structural inefficiencies in production reduce its ability to compete internationally. In addition, fluctuations in exchange rates have a direct impact on the revenues of both exporters and farmers. The conclusion targeted on the improvement in production efficiency and policy support can significantly enhance the productivity and long-term competitiveness of Thailand's Jasmine rice in the global market.

Acknowledgment

The successful completion of this thesis would not have been possible without the guidance and support of my research advisors. I am deeply grateful for their valuable consultation, constructive feedback, and continuous encouragement throughout the process. Their expertise, patience, and careful attention to detail ensured that the content was accurate, complete, and thorough.

Firstly, I would like to express my sincere gratitude to my supervisors, Professor Maria Bruna Zolin and Professor Paola Ferretti, for their continuous support and invaluable guidance throughout the entire research process. I am especially thankful for the opportunity to be one of your thesis students, and for the time and effort you dedicated to providing clear explanations and constructive feedback during our meetings to improve the quality of my research.

Moreover, I would like to express my gratitude to the university and all professors for providing valuable lectures, which I was able to adapt and apply in my thesis work. I sincerely thank the 100 respondents who dedicated their time to participate in my research. I am also deeply grateful for the support of my family and cousins in Northeastern Thailand, as well as my classmates and all members of Ca' Foscari University of Venice, whose contributions have been essential to the successful completion of this academic journey.

Lastly, I sincerely hope that this research will be of considerable academic benefit and value. If there are any errors or shortcomings that may remain, I sincerely apologize, and it is solely my responsibility.

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Introduction

Rice is a cereal grain and in its domesticated form is the staple food of over half of the world's population, especially in developing countries and particularly in Asia and Africa. Rice has become commonplace in many cultures worldwide and it is one of the main produced commodities of the world, placing it third after sugarcane and maize in 2021. The world production of rice was 790 million metric tons, led by China and India with a combined 52% of the total production (FAO, 2021). Additionally, other producer majors were Bangladesh, Indonesia, Vietnam and Thailand. 90% of global production comes from Asia (Fukagawa, et al., 2019).

Rice plays a crucial role in global food security, crops and it feeds over half the world's population, especially in Asia, Africa, and Latin America. It is a primary source of calories and nutrition. The consumption of rice varies across regions and countries, influenced by factors such as availability, geographical area, economic status and dietary preferences. In the future it is expected that, due to sustainable growth in population and development of agricultural practices which improve rice yields and strengthen rice supply, market performance is to continue its mild upward trend. The largest consumption of rice referring to the data in 2024 to 2025 is China, following that, India is ranked as second in rice consumption in the same period (Shahbandeh, 2025).

The varieties of rice are typically classified as short-grained, medium-grained, and long-grained and it is also based on grain size, texture, aroma, and color of its genres. Asian rice (*Oryza sativa*) has two subspecies, *indica* and *japonica*, and can generally be distinguished by length and stickiness. *Indica* rice is long-grained and non-sticky, while *japonica* rice is short-grained and glutinous. Among these categories there are different types such as Thai Jasmine rice, which is aromatic, and unusually for a long-grain rice it has some stickiness, with a soft texture. Indian Basmati rice is very long grained and aromatic. Italian Arborio rice, used for risotto, is of medium length, oval, and quite sticky and Japanese sushi rice is a sticky short-grain variety.

Jasmine rice or also called "Khao Hom Mali", it is a long-grain variety of fragrant rice or aromatic rice. Its rice have a high quality that is primarily grown in northeastern Thailand, Cambodia (Cambodian jasmine rice), Laos, and Vietnam. It is moist and soft in texture when cooked, with a slightly sweet flavor. The grains cling and are somewhat sticky when cooked, though a bit sticky than glutinous rice, as it has less amylopectin. It is about three times stickier than American long-grain rice.

Thai jasmine rice is a type of rice strain most produced in Thailand although it is thought that only Surin, Buriram, and Sisaket Provinces can produce with high quality, it has a slender shape, distinct aroma and also as a cultural symbol. Most of the jasmine rice exported internationally to Singapore, Hong Kong, North America, and Europe is Thai jasmine rice, with a small portion come from Vietnam.

The Thai's Jasmine rice, internationally recognized for its fragrance, high quality and texture, holds a significant place in both the domestic agricultural sector and global rice market. The rice farm sector is an engine behind the country's economic growth. In 2017, the value of rice traded accounted around 12.89 percent of all farm production (Wipatayotin, 2018). According to data from the Observatory of Economic Complexity (OEC), In 2023, The share of Thai rice in global export was 5.3 billion dollars, making it the second largest exporter of rice in the world (OEC, 2023b). Jasmine rice has a high-value and high-price product much higher than India and Vietnam, accounting for its value of Jasmine genres was 24.04 percent in 2023 (TREA, 2023). Rice contributes substantially to national revenue and supports the livelihoods of millions of smallholder farmers. Despite its global popularity, producers face growing uncertainties in global trends influenced by production cost, international competitive price with similarity and quality of rice challenge on Thai farmers. The shifting global trade dynamic could result in market share and export demand for rice. The rise of competing rice exporters and producers have posed new challenges for Thai Jasmine rice farmers.

While Jasmine has many advantages such as premium-priced value for overall production, many farmers still face low profitability since impact from unstable prices, high input cost (fertilizers, water, labors). The uncertainty price of all above rice including Jasmine reflected the upcoming future on rice producing structure for farmers in Thailand. Meanwhile, the factor of international trade policy also directly impacts yields, productivity, crop quality, and farmer livelihoods.

The thesis aims to better understand the interconnections between international economic trends and local agricultural livelihoods by examining how the global dynamics market influences production and export of Thai's Jasmine rice, and how these changes affect Thai farmers.

Chapter one provides an overview of the global rice sector, setting the foundation for understanding international dynamics. *Chapter two* focuses on rice production and consumption in Thailand, examining the structure of the Thai rice market and assessing the influence of international trade policies and agreements on Thailand's rice exports.

Chapter three analyzes the economy and market trends of Jasmine rice, both globally and within Thailand. This chapter explores pricing mechanisms in relation to global demand and competition and investigates how shifts in the market impact the livelihoods and farming practices of Jasmine rice producers. Lastly, the finding and implication for practice to remain competitive with Thai Jasmine rice in global markets will be presented at the end of study.

Chapter 1: Rice overview

Rice feeds people more than half of the world's population, with Asia, Sub-Saharan Africa, and South America being the largest consuming regions (Yin Hui, 2022). It serves fundamental nutrition such carbohydrates, proteins, vitamins, and minerals. Its value contributes about 40% to 70% of the population's total calories intake, it provides energy and plays a crucial role in global food security. Additionally, rice is beneficial as it creates many valuable new products such as rice husks, rice stubble, rice bran, broken rice and rice straw are used as common ingredients in different food products, livestock feed, industrial, household and building products (Yin Hui, 2022). The trends of the world demand for rice by the year 2025 is estimated to be about 765 million metric tons as compared with the present production of around 556 million metric tons (FAO, 2025c). Rice is by far one of the most important commercial food crops.

Rice is primarily cultivated in Asia. The earliest rice cultivated may have been seen in China roughly 10,000 years ago; some evidence suggests that China had rice fields as early 2300 BCE, Meanwhile, in South East Asia had rice farms as well, Rice most likely came to Western countries through the traders and voyagers of the Columbian Exchange in the fifteenth and sixteenth centuries. Meanwhile, Africa developed and domesticated its own species of rice called African rice (*Oryza Glaberrima*), though this variety didn't gain as much popularity globally (Hui Yin, 2022).

Rice plants produce a variety of grains and can be classified by their grains. There are varying types depending on length, cooking techniques, and even texture after cooking. The first type is short-grain rice, which are grains that are almost round in shape. This type of rice is very starchy and tends to clump together when cooked. Secondly, medium-grain rice types have a lower starch content, depending on the cooking method and the variety of medium-grain, a dish can result in a creamier texture rather than a sticky one. This type of rice is mostly used in risotto. Aside from risotto, medium-grain types are also used in dishes such as arancini, rice salads, table rice, and fried rice. Lastly, long-grain rice is mainly cultivated in South and Southeast Asia. This type of rice has the lowest starch content. This results in dry grains that don't stick to each other, unlike the other two main types of rice, which can easily recognize long-grain rice by its length, which is three to five times its width. It's also very aromatic. This rice is the best for dishes such as pilaf, biryani, curry, Indian, Palestinian, and Thai cuisine.

Among the types of rice there are two main varieties and subspecies which have fundamental differences which adapt to their characteristics.

- Indica rice which is usually long-grain and aromatic such as Basmati rice which is popular in India and Jasmine rice is a variety that is primarily grown in Thailand.
- Japonica is the second main variety of rice, there are short to medium-grained and have very little overt aroma, for example sushi rice, Carnaroli and Arborio rice which is hailing from Italy and glutinous or Sticky rice is primarily used in Asian cuisine sort of sweet dishes, side dish, and even as a main dish.

The rice can be classified in two main varieties as in table 1.

Table 1.1: Types of rice produced worldwide

Type (Variety)	Where grown (cultivation countries)
Indica	Tropical and subtropical regions such as India, Pakistan, Thailand, Vietnam, Burma, Cambodia, the Philippines, Indonesia, Malaysia, southern China, and Brazil
Japonica	Regions with cooler climates such as Japan, North Korea, South Korea, certain regions of China, California, the European Union, Russia, Australia, and Egypt

Source: USDA, Economic research service (2025a).

The rice production process starts from planting. Farmers begin rice production by soaking the rice seeds prior to planting. It can be either by mechanization or seeding manually by hand. In many Asian countries that haven't mechanized their rice farming practices, seeds are sown by hand (Yin Hui, 2022). After 30-50 days of growth, the seedlings are transplanted in bunches from nursery beds to flooded paddies (Yin Hui, 2022). After it fully grows, grain begins to ripen, the grains ripen further, and harvesting is commenced. The rice crop is either harvested by hand or machine. By hand, rice plants are cut with sharp knives or sickles. This practice still occurs for most Asian rice. Once harvested, the rice is commonly named paddy rice. This is the name given to unmilled rice with its protective husk in place.

Next step is that the rice needs to dry out naturally with sunshine. Once dried, the rice grain, now called rough rice, is ready for hulling processing which is more often processed at a mill with the help of automated processes, step by passing through a number of sieves that sift out the debris, and blown air removes the top matter, from the shelling machine, the grains hull are conveyed and separate hulled grains(also called as brown rice) from unhulled grains. Finally, the brown rice runs through two huller machines that remove the outer bran layers from the grain (Yin Hui, 2022). With the grains pressed against the inner wall of the huller and a spinning core, the

layers are rubbed off. The core and inner wall move closer for the second hulling, ensuring the removal of all bran layers and now light-color grains are cooled and polished by a brush machine with Oftentimes, the polished rice is then coated with glucose to increase luster. Once complete, the rice is called converted rice (Hui Yin, 2022).

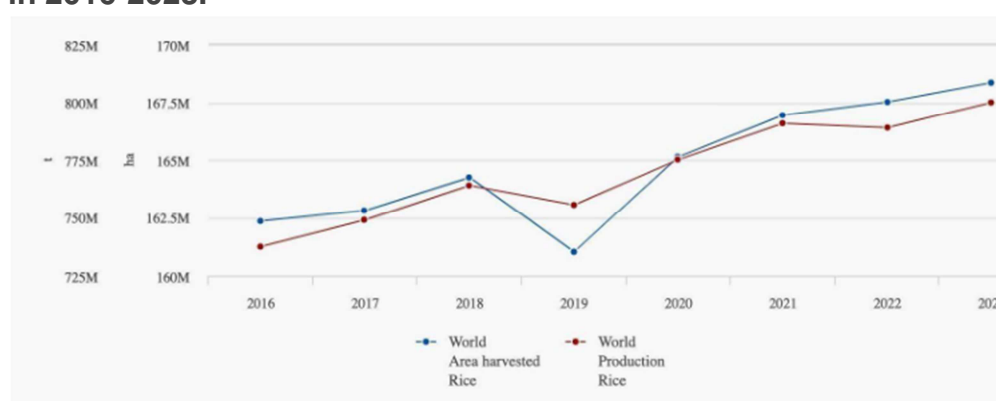
1.1 Rice Production (Rice Supply)

❖ *Rice production at the global level*

Following record data of FAO, the trends of rice production from 2016 to 2023, the global rice production and yield quantity of rice has always gradually increased since the beginning. Except in the year 2019, world production has fallen from approximately 763 million to 755 million metric tons. Afterward, it always trended upward and the world paddy rice quantity slowly increased till 2023. The largest cultivation of paddy rice during these years were Asian, accounting for 89.9 percent, Africa about 4.8 percent, America with 4.7 percent and Europe accounted for 0.5 percent (FAO, 2023).

According to the United States Department of Agriculture (USDA, 2025c), the global harvested area for rice in 2024 was approximately 166.09 million hectares, with an average yield of 4.70 metric tons per hectare, and it resulted in a total paddy rice production of around 780.24 million metric tons for the year (USDA, 2025c).

Figure 1.1 World production/Yield quantities (millions of metric tons) of Paddy Rice in 2016-2023.



Source: FAOSTAT (2023)

The forecast predicts modest increase in 2025 global rice production was forecast to reach a record high of 543 million metric tons (in milled equivalent) in 2024/2025, driven by positive crop prospects in India and favorable growing conditions in Cambodia and Myanmar (Armellini, 2025). To convert this figure to paddy rice terms, it is essential to account for the milling process, which typically results in a milling recovery rate from 65-70% (Miller Refereed, 2014). Applying this conversion, the

estimated global paddy rice production for 2024/25 would be approximately 775 to 835 million metric tons.

USDA, Economic Research Service also has published a forecast recently based on current data and trends in January of that world production of rice (milled basis) that the global rice production in 2024/2025 is projected at a record high of 532.9 million tons (milled basis) approximately 761-819 millions of metric tons Paddy rice, India's production is projected to increase the most in 2024/2025, up 7.2 million tons from a year earlier to a record 145.0 million. Record crops are also projected in 2024/25 for Pakistan and Sri Lanka. Indonesia's 2024/25 rice production is projected to increase 980,000 tons to 34.0 million (USDA, 2025b, p.13).

As rice has some processes and its value contributes in various ways, its rice has five different products that can be produced from rough rice (Paddy rice): hulls, bran, brown rice, whole kernel milled rice and broken. Brokeners are separated into three categories based on descending size: second heads, screenings, and brewers. The first stage of milling removes the hull, producing brown rice that can be cooked and consumed. The next stage removes the bran layer, leaving whole-kernel milled white rice but creating some broken kernels as well. Most of the bran rice is used for animal feed.

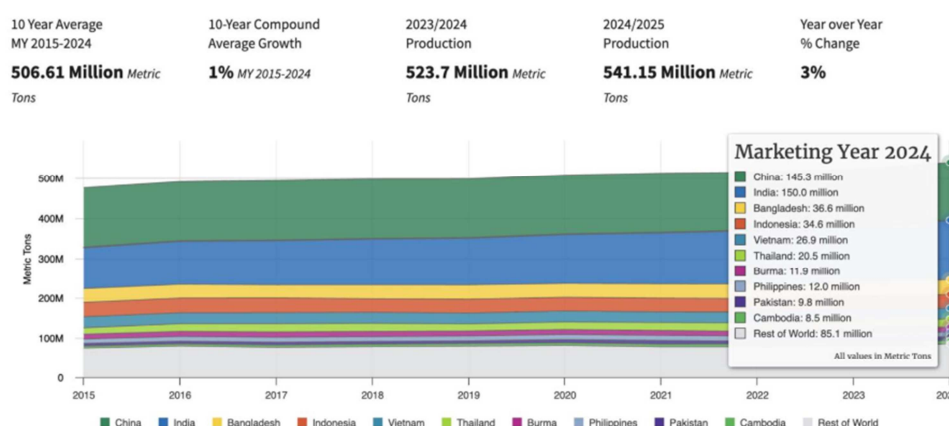
❖ *The main producing countries*

According to U.S. department of agricultural data (USDA, 2024a), the main producing countries of milled rice in 2024 (marketing year) are:

- India, representing 28 percent in total of world rice production which produced about 150 million metric tons of milled rice, a higher quantity than any other country;
- China with over 145 million metric tons, representing 27 percent the same percentage as India;
- Bangladesh, which produced around 36 million metric tons and accounts for 7 percent;
- Indonesia with 34 million metric tons with 6 percent of overall world production;
- Vietnam with 26 million metric tons, shows 5 percent of production;
- Thailand has around 20 million tons in terms of milled rice, which represents 4 percent of the world rice production.

The estimated total volume of milled rice produced worldwide was about 535.8 million metric tons in the 2024/2025 production year, which is increasing compared from last year by about 3 percent (USDA, 2024a).

Figure 1.2 Global production trend of milled rice in 2024 (market year).



Note: The marketing year (MY) refers to the 12-month period that begins with the harvest of a crop and continues through its processing, distribution, and sale.

Source: USDA (2024a)

Table 1.2 Top producing countries in 2024/2025 (crop year) of rice production in Metric Tons in 2024/2025 (Crop year)

Country	Percent of Global Production	Quantity (million metric tons)
India	28%	150.00
China	27%	145.28
Bangladesh	7%	36.60
Indonesia	6%	34.60
Vietnam	5%	26.95
Thailand	4%	20.55
Philippines	2%	12.00
Burma	2%	11.90
Pakistan	2%	10.00
Brazil	2%	8.47

Source: USDA (2024a)

1.2 Rice consumption

❖ Rice consumption at the global level

Rice is one type of fundamental food which is consumed for over half the world's population, particularly in Asia and Africa. It is served at meals in homes and restaurants, and is a basic part of most Asian food systems. In 2021, 790 million tons (paddy rice) were produced, placing it third after sugarcane and maize (corn) (FAO, 2021). According to the United States Department of Agriculture (USDA, 2025d), the total rice consumption and residual use for the 2021/2022 (crop year) totaled 518.7 million metric tons: China accounted for the largest share of global consumption at

30.14 percent, followed by India with 21.29 percent, Bangladesh Indonesia and Vietnam contributed 7.04 percent, 6.81 percent, and 4.25 percent of the total consumption, respectively (table 3.1) (USDA, 2025d).

Table 1.3 Rice consumption and residual in 2021/2022 (Crop year)

Consumption and Residual in 2021/2022 (milled rice)		
Country	Quantity (1,000) metric tons	% of total global consumption
China	156,360	30.14
India	110,446	21.29
Bangladesh	36,500	7.04
Indonesia	35,300	6.81
Vietnam	22,050	4.25
Philippines	15,400	2.97
Thailand	12,300	2.37
Burma	10,300	1.99
Nigeria	7,350	1.42
Japan	8,200	1.58
Others	97,421	19.00
Subtotal	513,970	99.09
United States	4,740	0.91
World Total	518,710	100.00

Source: USDA (2025d)

Following table data aggregated from FAO reports spanning 2020 to 2024 (FAO, 2020–2024) below, global rice utilization in the recent year of 2024/2025 crop year is forecasted to reach approximately 535.8 million metric tons. This represents an increase of 25.3 million metric tons, or it is expanding about +4.7 percent, compared to the 2020/2021 period (FAO, 2024). The term "utilization" is included in the total quantity of rice used for all purposes, including human consumption, domestic uses, and other non-food uses such as animal feed or industrial use, as detailed in table 3.2. This steady growth over the past four years in rice utilization underscores the crop's continued significance as a staple food and vital commodity in the global food system.

Table 1.4 World rice production, utilization and stock in 2020/2021-2024/2025 (milled metric tons)

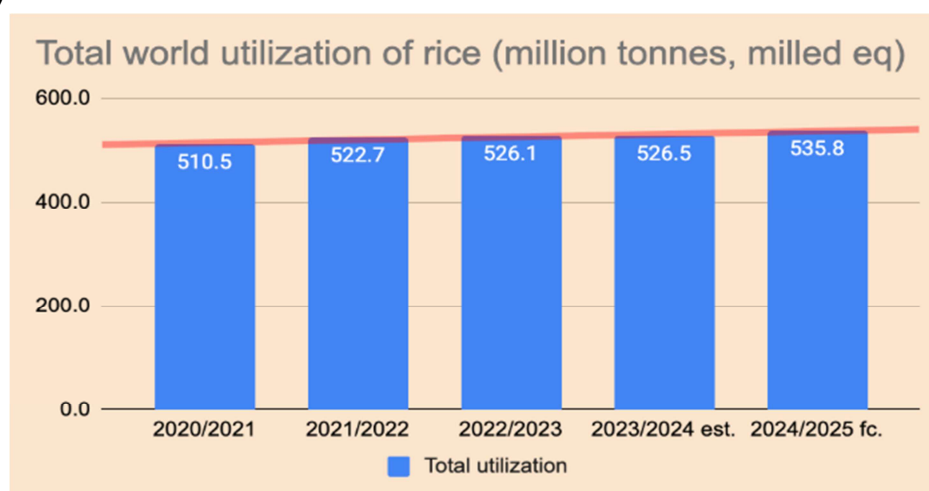
	World rice production, utilization and stock in calendar year 2020 - 2025					
	2020/21	2021/22	2022/23	2023/24 EST.	2024/25 forecast	Change: 2024/25 Over 2020/21
	million metric tons , milled equivalent					%
WORLD BALANCE						
Production	517	526	525.6	534.7	538.9	4.2
Trade(1)	51.5	56	52.9	51.8	54.9	6.6
Total utilization	510.5	522.7	526.1	526.5	535.8	4.7
Food	417.9	419.1	421.6	427.4	434.4	4.9
Ending stock(2)	191.4	197	194	199.4	205.4	7.3
SUPPLY AND DEMAND INDICATORS						
Per caput food consumption:						
World (kg/yr)	53.2	53	52.6	52.8	53.2	
LIFDC (kg/yr)	N/A	28.5	28.2	27.9	28.3	
World stocks-to-use ratio (%)	36.7	37.9	36.9	37.2	37.9	
Major exporters' stocks-to-disappearance ratio (3)(%)	28.2	28.7	28.5	31	31.5	
FAO RICE PRICE INDEX (2014-2016=100)	2020	2021	2022	2023	2024 Jan-Oct	
	110	106	109	132	136	

NOTE: (1) Calendar year exports (second year shown). (2)May not equal the difference between supply (defined as production plus carryover stocks) and total utilization due to differences in individual country marketing years. (3)Major exporters include India, Pakistan, Thailand, the United States of America and Viet Nam.

Source: FAO (2020-2024)

As shown in the table 1.5 provided, global per capita rice consumption for the 2024/2025 crop year is forecasted at approximately 53.2 kilograms per person per year for all regions (FAO, 2024). This figure reflects a relatively stable level of rice consumption worldwide, indicating that rice remains a crucial dietary staple across many regions. While the change is modest, it also highlights subtle shifts in dietary patterns, economic conditions, or the availability of rice in certain parts of the world.

Figure 1.3 Rice utilization from 2020- 2024 (million metric tons, milled equivalent)



Source: FAO (2020-2024)

Overall, from 2020 to 2024, global rice consumption gradually increased year by year. This growth reflects rising overall demand driven by population expansion, urbanization, and the continued reliance on rice as a staple food in many countries. Despite external challenges such as economic factors, climate change variability, and trade constraints, global rice utilization remained on an upward trend line throughout the period. This rising trend represents the central role of rice in global food security and the importance of maintaining stable supply chains to meet future demand.

1.3 Global rice trade

❖ *Rice trade at the global level*

Rice is a cereal grain, staple food in Asia, Latin America and some parts of Africa. It holds a significant portion of the world's most important commodities due to it playing a role needed in food for many nations. Most of the rice produced is consumed domestically and exported. International trade of rice plays a critical role in balancing region surpluses and shortage in rice. While demand is concentrated in Asia, Africa, and parts of the Middle East, trade flows are influenced by factors such as government policies, climatic conditions, production costs, and shifting consumer preferences. Hence, international trade is also one of the key roles in determining the world supply and demand of rice.

According to the latest data from The Observatory of Economic Complexity (OEC, 2023a) statistics, the world trade of rice in 2023 was 34.2 billion dollars, which is reflecting the growth of 0.52 percent increase from 2022, when trade was 34 billion dollars, indicated that over the past 5 years, trade of rice has grown at an annualized

rate of 4.42 percent which is out of 1,217 globally traded products, rice ranked 127th in terms of total trade value (OEC, 2023a).

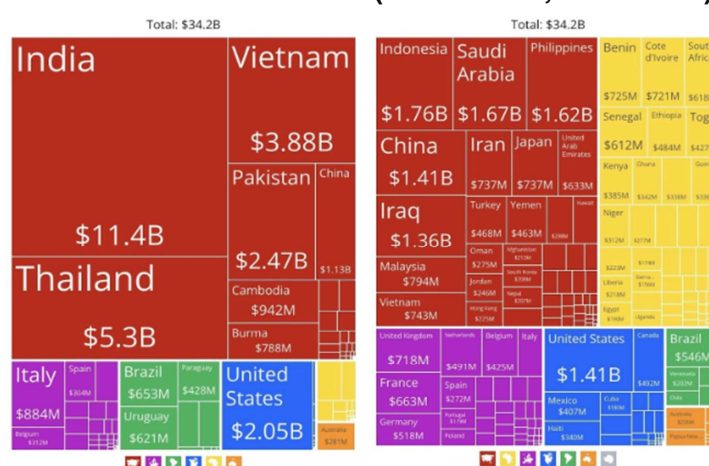
In 2023, the leading rice exporting countries globally, based on export value (in dollars) and market share percentage, were (OEC, 2023a):

- India emerged as the world’s leading rice exporter, with exports valued at approximately 11.4 billion dollars or 33.4% of share in global export of rice;
- Thailand represented 5.3 billion dollars or accounted for 15.5% of share in global export of rice;
- Vietnam ranked third, exporting rice worth around 3.88 billion dollars or 11.3% of share in global export of rice;
- Pakistan exported at 2.47 billion dollars or 7.22% of world share in global export of rice.

Meanwhile, the leading rice importing countries globally in 2023, based on export value (in dollars) and market share percentage, were (OEC, 2023a):

- Indonesia was the largest rice importer in 2023, with imports totaling 1.76 billion dollars or accounted for 5.15% of total world import of rice;
- Saudi Arabia ranked as the second at 1.67 billion dollars or 4.87% of total world import of rice;
- Philippines imported rice valued at 1.62 billion dollars or 4.74% of world rice importing;
- China represented 1.41 billion dollars or 4.12% of total world import of rice.

Figure 1.4 World trade of rice in 2023 (value term, in dollars)



Exporter of rice in 2023 Importer of rice in 2023

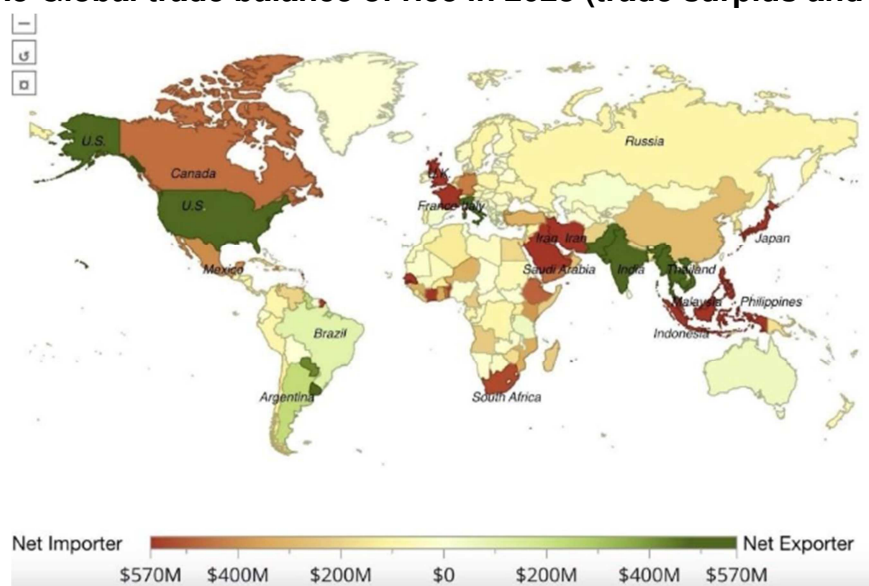
Source: OEC (2023a)

As reported in 2023, referring data from OEC, the leading countries with the highest rice export values and corresponding trade surpluses were India, with approximately 11.4 billion dollars, followed by Thailand at around 5.29 billion dollars, and Vietnam with 3.14 billion dollars (OEC, 2023a). In contrast, the countries experiencing the

largest rice trade deficits where imports significantly exceeded exports were Indonesia, with a deficit of approximately -1.76 billion dollars, Saudi Arabia at -1.66 billion dollars, and the Philippines with a deficit of around -1.62 billion dollars (OEC, 2023a).

Following the OEC map shown as below, showing the trade balance of rice in 2023. Colors mainly green and red shades represent the difference between each country's export and import values. The *green shade* shows trade surplus (exports larger than imports) such as India, Thailand, Pakistan, Burma, Laos, Vietnam, Italy and the United States. Meanwhile, *red shades* shown in the map represent trade deficits (Which import rice more than exporting), for instance Indonesia, Malaysia, Philippines, Japan, Iraq, Iran and Saudi Arabia (OEC, 2023a).

Figure 1.5 Global trade balance of rice in 2023 (trade surplus and trade deficit)

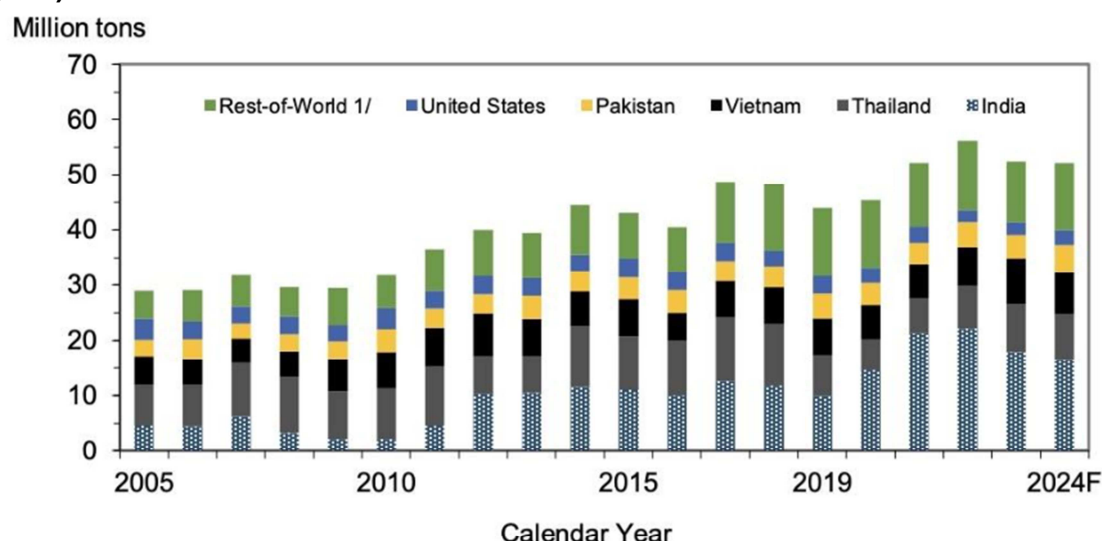


Source: OEC (2023a)

According to the United States Department of Agriculture (USDA, 2024), however, global rice trade in 2023 experienced a notable contraction in quantity term (refer to figure 1.6), on the export side, India's shipments declined significantly due to the imposition of export restrictions, India's rice exports have been constrained by a series of export bans and restrictions implemented in September 2022. These measures, introduced by the Government of India, were primarily aimed at ensuring sufficient domestic supply and stabilizing domestic rice prices. By limiting exports, the government sought to maintain rice availability and affordability for the domestic population amid concerns over inflation and food security. Regarding this impact to create opportunities for other exporters such as Myanmar (Burma), Pakistan, and Thailand gaining sale from India's export restrictions, while the import side, the most significant reduction in demand was observed in the European Union, while Malaysia recorded the largest increase in rice imports (Childs, et al., 2024, p.21). However,

India maintained its position as the world's leading rice exporter of world market share in the calendar year of 2023, despite facing challenges due to export restrictions and global market fluctuations (Glauber, et al., 2024).

Figure 1.6 World rice export in quantity (million tons) from 2005-2024 (Calendar year)



Rice exports are reported on a milled basis for each calendar year; 2023 and 2024 are forecasts. F = forecast.
1/ Primarily Burma, China, Cambodia, Argentina, Brazil, Paraguay, Uruguay, and Australia.

Source: USDA (December, 2023a)

Following above data (Figure 1.6), India's rice exports marked a noticeable decline in 2023; the overall reduction is largely attributed to the Indian government's export restrictions. These measures implemented to secure domestic food availability and curb rising prices included bans on non-basmati white rice and tightened controls on parboiled rice exports. Consequently, the policy shift significantly impacted global rice supply and trade flows.

Table 1.5 World rice supply, utilization and exports quantity (1,000 metric tons) in 2020-2024

World rice supply and utilization, 2020 - 2025										
Market year	Area harvested	Yield (2)	Beginning stocks	Production (3)		Total supply	Exports (4)	domestic use (5)	Ending stocks (6)	Stocks use ratio (7)
				Rough	Milled					
	1,000 hectares (ha)	Metric tons/ha	- - - - -	- - - - -	- - - - - 1,000 metric tons - - - - -					Percent
2020/21	164,889	4.61	182,767	760,698	509,431	692,198	53,172	503,460	188,738	37.50%
2021/22	165,639	4.63	188,738	767,645	514,065	702,803	57,222	518,603	184,200	35.50%
2022/23	165,685	4.66	184,200	771,965	516,695	700,895	53,839	520,183	180,712	34.70%
2023/24	166,098	4.7	180,712	780,247	522,310	703,022	59,943	523,464	179,558	34.30%
2024/25 (8)	168,591	4.72	179,558	795,775	532,663	712,221	58,499	530,712	181,509	34.20%

(2) Yields are based on rough production.(3) Production is expressed on a both rough and a milled basis.(4)Exports are reported on a calendar-year basis: for 2023/24, exports are reported for calendar-year 2024. Trade data have been adjusted to exclude Intra-European Union trade since 1980.(5)total domestic use represents apparent utilization, including annual stock-level adjustments, domestic use and a residual component

that accounts for post-harvest loss. (6) Stocks data are based on an aggregate of different market-years not constructed to represent world stock levels at a fixed point in time. Stock data are not available for all countries. (7) Stocks-to-use represent the ratio of marketing-year ending stocks to total domestic use. (8) Forecast as of March 11, 2025.

Source: USDA (March, 2025c)

As the above table shows global rice exports have shown a generally upward trend from 2020 to 2024. In the 2020/2021 (marketing year), world rice exports were recorded at 53.17 million metric tons, gradually rising to 57.22 million tons in 2021/2022 and then dropped to 53.84 million tons in 2022/23. The highest export volume is projected for 2023/24, reaching 59.94 million metric tons, before slightly declining to a forecasted 58.49 million tons in 2024/2025 (USDA, 2025c). The trend reflects increasing global demand and trade activity, though fluctuations such as policy interventions in major exporting countries like India may influence annual variations.

The European Union is largely self-sufficient in Japonica rice, a short to medium grain variety considered the "traditional" European rice, which accounts for approximately 75 percent of total EU rice production. In contrast, the remaining 25 percent of production is dedicated to Indica rice, a long-grain variety commonly referred to as "traditional" Asian rice. For Indica rice, the EU is not self-sufficient and remains a significant net importer. To meet its demand, the EU primarily imports Indica rice from Cambodia at about 24%, approximately 21%, and Thailand at 18% (European Commission, 2019).

1.4 Global rice price variation

The global rice price index serves as a key economic indicator that reflects the overall movement of rice prices in international markets. The index captures average price trends across major rice exporting and importing countries. It indicates the price range from different rice varieties such as indica, aromatic, japonica, and glutinous.

The rice price index is shaped by a range of interconnected factors that influence both the supply and demand of rice in international markets. One of the most significant drivers for rice prices is production performance in major exporting countries such as India, Thailand, Pakistan and Vietnam, including adverse weather events like droughts or floods that can reduce yields and push prices upward. In addition, government trade policies, such as export bans or restrictions, can constrain global supply and lead to price spikes as seen in India's rice export restrictions in 2023 (Childs, 2023).

According to the FAO All Rice Price Index (FARPI), global rice prices in 2024 experienced noticeable fluctuations compared to the base period (2014-2016)

(Figure 1.7). The index is based on the average international rice prices during the 2014-2016 period, which is set at 100 points (FAO, 2025a). As illustrated by the *black line* following the figure, rice prices in 2024 showed a gradual downward trend, at the beginning of the year, the index was recorded above 140 points, indicating that rice prices were significantly higher than the base average after by the end of the year, the index had fallen to approximately 120 points, suggesting a decline in prices while still remaining above the historical average (FAO, 2025a).

Figure 1.7 FAO rice price index in 2021 - 2025



Source: FAO (2025a)

Over the past five years, rice prices have shown notable fluctuations. In 2024, the FAO all rice price index stood at 133.1, indicating a rise above the 2014-2016 base average by about 33.1 points higher and it was an increase of 20.78 percent compared to 2020. Most rice varieties experienced price growth over this period: the indica index rose by 26.48 percent, the aromatic index increased by 5.43 percent, and the japonica index climbed approximately 13.28 percent (FAO, 2025a). In contrast, the glutinous rice index was the only variety to decline, falling by about 13.38 percent from its 2020 level (Figure 1.7) (FAO, 2025a).

Table 1.6 Annual average rice price indices from 2020 to 2024,

2014-2016 =100	FAO Rice price indices				
	2020	2021	2022	2023	2024
FAO ALL RICE PRICE INDEX	110.2	105.8	108.8	132.0	133.1
Indica Index	114.4	112.2	110.2	138.1	144.7
Aromatic Index	97.6	86.9	102.0	113.5	102.9
Japonica Index	89.6	101.4	129.4	136.8	101.5
Glutinous Index	124.0	87.3	88.5	103.5	107.4

Source: FAO (2025a)

The FAO All Rice Price Index (FARPI) tracks international rice prices by grouping them into four major types: Indica, Aromatic, Japonica, and Glutinous rice. For each type, the index calculates an average price by taking a simple average of selected representative international price quotations. These prices are then aggregated into a single index by weighting each rice type according to its fixed share in global trade. In terms of quality, rice is categorized based on the percentage of broken kernels. Higher-quality rice has 15 percent or less broken grains, while lower-quality rice exceeds this threshold. Among the sub-indices, the Aromatic rice index reflects price movements of well-known aromatic types, especially Basmati and other fragrant rice varieties (FAO, 2025a).

In summary, rice prices are shaped by a range of interconnected factors, including supply and demand dynamics at both domestic and international levels, trade policies and export restrictions, climatic and weather conditions, major global events such as the COVID-19 pandemic (2019-2020), and fluctuations in the currency values of major exporting countries.

Chapter 2: Thailand's rice economy

Rice holds a crucial role in Thailand, not only a main staple consumption food for Thai's population but also as a major agriculture commodity and it represents a significant portion for the economy and labor force in Thailand. In 2021, Thailand's Agriculture sector including rice sector contributed approximately 8.5 percent of GDP (The Hong Kong Trade Development Council (HKTDC), 2024). Thai rice is the most important crop and it is one of the commodities produced in Thailand, ranked as second in most produced domestic commodities after sugarcane. While rice is produced as a second commodity in Thailand, it remains the most valuable crop in terms of production value. In 2018, the agriculture sector in Thailand had about 32 percent of total labor force or 12.7 million national work (International Labor Organization (ILO), 2019). In crop year 2022/2023, more than 5 million households, or about 67 percent of Thailand's agricultural workforce, were working in rice cultivation (Sowcharoensuk, 2024b). In terms of land cultivation, rice is the most planting crop; 45 percent of all Thai farmland is devoted to rice production (Sowcharoensuk, 2024b).

The World Rice Conference, organized by the rice trader under the International Commodity Institute, is a global platform dedicated to the rice industry. The conference provides in-depth analysis of global rice trends and aims to support the development of the industry through education and research. In 2017, the conference awarded Thailand's Hom Mali 105 as the World's Best Rice, based on criteria such as taste and grain shape (Arunmas, 2017). Cambodia and Vietnam took second and third place, respectively. In subsequent years, the top honors have consistently gone to a few standout varieties of premium fragrant rice such: Thailand's Hom Mali 105, Cambodia's Phka Romduol (also known as Malis Angkor), and Vietnam's ST24 and ST25.

2.1 Rice production in Thailand

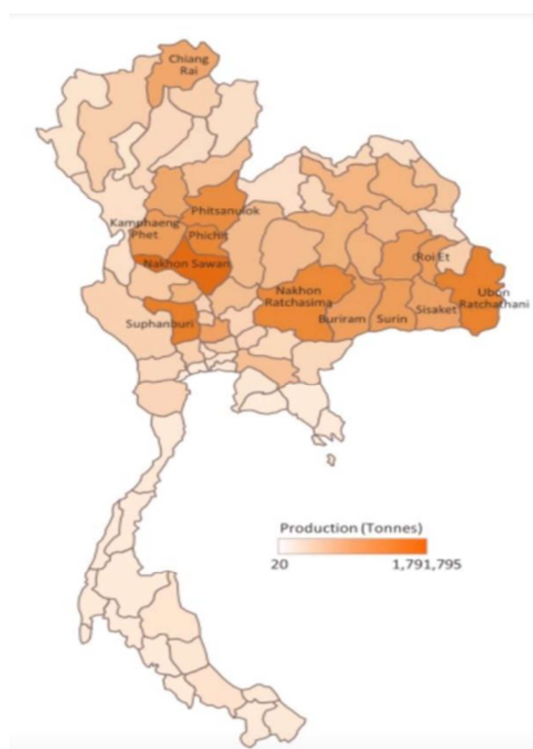
❖ *Rice cultivation in Thailand*

Thailand has been consistently ranked among the world's top rice producers and exporters. The major cultivation rice region is northeastern (also called Isan), accounting for 41 percent of national production, followed by northern at 33 percent and central with 25 percent of the total rice production (USDA, 2025e). The producing provinces such as Nakhon Ratchasima, Ubon Ratchathani, Sisaket, Roi Et, and Surin provide the bulk of rice production in the northeastern region (Sowcharoensuk, 2024b). The main crop provinces in Northern include Nakhon Sawan, Pichit, Kamphaeng phet, Udon Thani and Chiang rai, and the central region as Suphanburi is also one with a lot of rice production (Figure 2.1) In the central

plains are characterized by sustainability practices of rice production (Sowcharoensuk, 2024b).

There are many preferences of rice which measure the variety of rice grown by producers. In Thailand, 9-10 million tons of rice per year is used domestically, which consists of the aromatic jasmine or Hom Mali rice with 10-15 percent, white rice about 60 percent and glutinous rice around 20-25 percent (Rerkasem, 2015, p.5). The effect of market demand on the variety of rice farmers determine to grow can be seen in the proportion of glutinous to Hom Mali rice, which fluctuates with their relative prices. Referring to Thai rice export association, Rice productivity recently year export was 9.95 million metric tons in 2024, the main type of rice export consists of white rice and its export quantity was about 57.88 percent, Thai Hom Mali rice (Jasmine rice) around 14.46 percent, broken rice was 13.03 percent, glutinous rice 1.48 percent, parboiled rice 12.70 percent and Husked (brown) rice approximately 0.41 percent. However, the most valuable in terms of profitability is devoted to Thai Hom Mali rice which its value was 21.85 percent compared to quantity export was 14.46 percent. Differently, white rice value was 53.90 percent compared to export volume in 2024, which was 57.88 percent (TREA, 2024).

Figure 2.1 Thailand rice (All type of rice) production area by province in 2022/2023

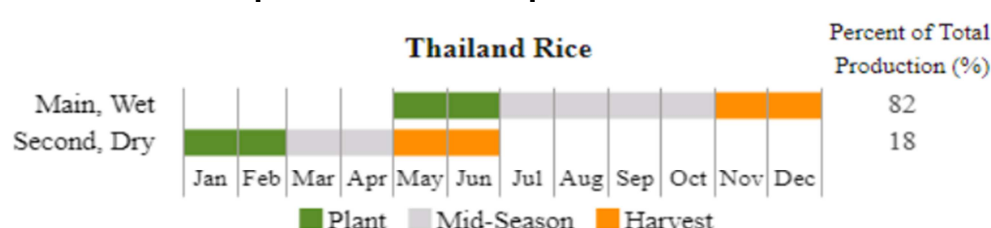


Source: Sowcharoensuk (2024b)

All kinds of rice plant and cultivation mainly have two seasons: in major seasons or also called the rainy season or wet season (also called Na Pee) starting from May to June, subsequently crop is then harvested in November to December, this

production accounts for 82 percent of total production in Thailand. The main crops and the farming method are only once a year. The 18 percent of total production is devoted to the second season or dry season (also called Na Prang), rice cultivation during irregular periods is planted in January to February and crops are harvested during May to June (Figure 2.2) (USDA, 2025e). It is commonly cultivated in and distributed mainly in areas like in the central plain region with a regime of irrigation system (Rerkasem, 2015). In the second season the cultivation period is shorter for harvest and is expected to produce two times rice crops per year. Thus, the majority of rice production in Thailand is generally planted during the raining period or Na Pee season.

Figure 2.2 Calendar crop of Thailand rice production



Source: USDA (2025e)

During the dry season, rice cultivation is distributed more in provinces from lower north to the central region which is located along the Chao Phraya river is a major area for second-season rice harvest, primarily due to its sufficient irrigation infrastructure that allows farmers to grow rice beyond the main rainy season. Unlike the main rainy season, which relies heavily on natural precipitation, the second-season rice farming in this area benefits from controlled water management systems. These systems enable farmers to cultivate rice during the dry season, typically from November to May, when rainfall is scarce. The availability of irrigation not only facilitates continuous rice production but also contributes to higher yields compared to the rainfed period. This strategic use of irrigation in the central plains underscores the region's significance in sustaining Thailand's rice output throughout the year.

As Thailand is one of the world's largest producers and its exports are a large quantity of rice produced. Moreover, rice plays one significant portion of the country's economy, labor force sector, food security and rural livelihoods. Following the table below (table 2.1), Thailand's cultivation land devoted to rice crop has shown a fluctuating trend with a slight upward movement over time.

Although there is year to year variations due to some factors such as water availability, market prices, and government policies. However, recently it has increased from 2015/2016 (MY) approximately 1.36 million hectares. To this, highlight how rice cultivation is one of the important sectors for Thai's economy over time.

According to U.S. Department of Agriculture (USDA, 2020) data in 2019, Thailand's rice production experienced a decline of rice production volume due to the impacts of environmental factors such as weather conditions. Extreme weather events such as prolonged droughts, which saw precipitation at critical low levels about 15 percent below normal average and 19 percent lower than the previous year's levels (USDA, 2020, p.2). Thus, in 2019 the rice yield has declined to 2.7 tons per hectare compared to years before. Therefore, irregular rainfall patterns, and severe floods have significantly affected rice yields and production. Thailand faced droughts, leading to a reduction in rice production and export volumes. Similarly, unpredictable seasons and rising temperatures have stressed water resources, making rice farming increasingly vulnerable. These climate related challenges highlight the need for sustainable water management. As a result, rice planting areas in 2019 were reduced, leading to lower yields and a decline in overall production. This drop in supply also affected Thailand's rice volume for exports. Yet, afterward it gradually increased (table 2.1).

Table 2.1 Thailand rice cultivation area (hectares) and production volume (thousand tons)

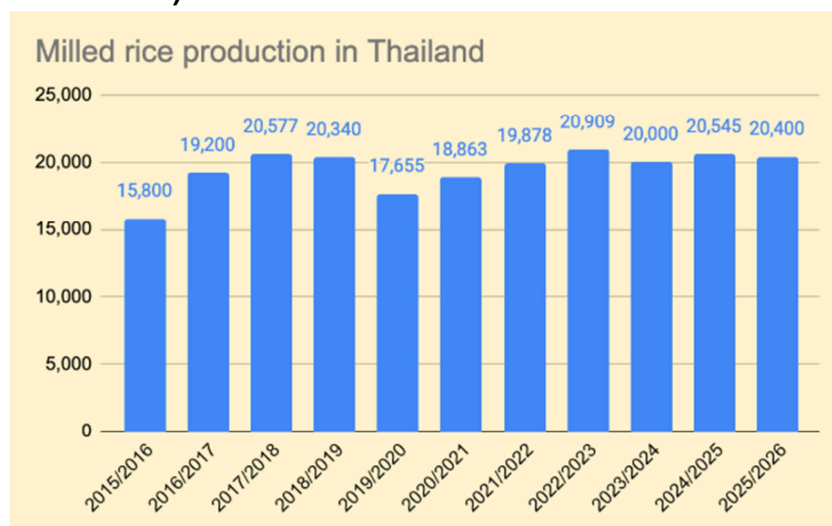
Market Year	Area	Milled Production	Rough Production	Yield
	(1000 Ha)	(1000 Tons)	(1000 Tons)	(T/Ha)
2015/2016	9,444	15,800	23,939	2.53
2016/2017	10,247	19,200	29,091	2.84
2017/2018	10,756	20,577	31,177	2.90
2018/2019	10,830	20,340	30,818	2.85
2019/2020	9,890	17,655	26,750	2.70
2020/2021	10,509	18,863	28,580	2.72
2021/2022	10,702	19,878	30,118	2.81
2022/2023	11,072	20,909	31,680	2.86
2023/2024	10,650	20,000	30,303	2.85
2024/2025	10,880	20,545	31,129	2.86
2025/2026	10,800	20,400	30,909	2.86
5-year Average 2020/21 - 2024/25	10,763	20,039	30,362	2.82
Percent Change From 5 Year Average (%)	0	2	54	1
Record	11,072	20,909	31,680	2.9
Record Year	2022/2023	2022/2023	2022/2023	2017/2018

PS&D Online updated on July 12, 2025

Source: USDA (2025e)

Following data shown in figure 2.3, Thailand's milled rice production trend has fluctuated over the past decade, particularly from the 2017/2018 to the 2025/2026 market years. Nevertheless, in 2024/2025, production rose significantly by approximately 4.74 million tons or about 30 percent compared with 2015/2016.

Figure 2.3 Thailand's milled rice production from 2015/2016-2025/2026 (in quantity of thousand tons)



Source: USDA (2025e)

2.2 Geographical Indications in Thai's rice production

Thai rice includes several varieties that have been granted Geographical Indication (GI) status, highlighting their distinctive qualities and strong links to specific regional origins. Thailand applied the Trade-Related Aspects of Intellectual Property Rights (TRIPS) Agreement under the World Trade Organization (WTO), and its GI certification system serves not only to enhance product reputation and marketability in international trade, but also protecting the country's rice biodiversity, traditional cultivation and cultural heritage. Currently, there are ten rice varieties that have received official GI recognition, each tied to particular geographic areas and traditional cultivation practices (Lerdluksamee et al., 2024) in (Table 2.2).

Table 2.2 Ten Thai geographical indication (GI) rice varieties.

No.	GI Rice Variety	Region in Thailand	Province grown, produce	Notable Characteristics
1	Hom Mali Thung Kula Rong-Hai Rice	Northeastern	Roi Et, Mahasarakham, Surin, Yasothon, Srisaket	The most famous fragrant (Jasmine) GI rice
2	Sangyod Muang Phatthalung Rice	Southern	Phatthalung	red rice with chewy texture, unique aroma
3	Hom Mali Surin Rice	Northeastern	Surin	glossy long grain Jasmine rice
4	Leuang Patew Chumphon Rice	Southern	Chumphon/ (Pathiu district)	long grain yellowish rice
5	Jek Chuey Sao Hai Rice	Central	Saraburi	long grain rice resistant to spoilage
6	Kum Lanna Rice	Northern	Chiang Mai, Chiang Rai, Lamphun, Lampang, Phrae, Nan, Phayao, Mae Hong Son	black glutinous rice, rich in nutrients
7	Rai Dawk Kha Phangnga Rice	Southern	Phangnga	fragrant and soft rice with traditional cultivation
8	Rai Leum Pua Petchabun Rice	Lower northern	Petchabun	aromatic black glutinous rice
9	Kalasin Kaowong Rice	Northeastern	Kalasin	fragrant sticky rice
10	Hom Mali Phayao Rice	Northern	Phayao	high-quality jasmine rice with soft and aromatic

Source: Lerdluksamee et al. (2024)

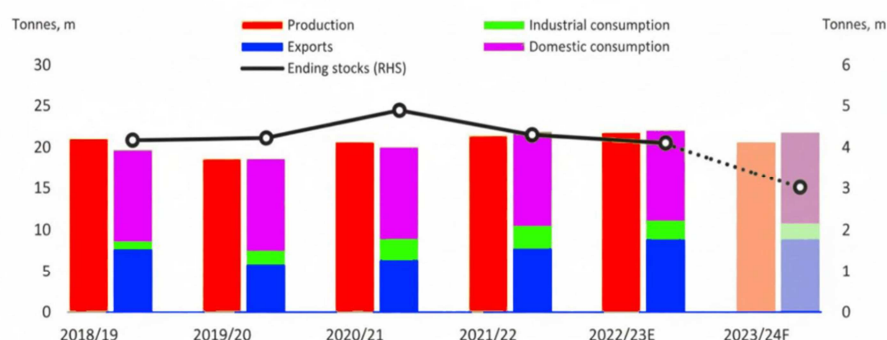
2.3 Rice consumption in Thailand

According to Krungsri research on rice industry by Sowcharoensuk (2024b), Thailand's paddy rice outputs of over the last decade averaged almost 32 million tons per year, after rice is polished, about 21 million tons of milled rice, and almost 11 million tons of milled rice output is consumed domestically. The remaining milled rice left is kept for stocks and export internationally. Therefore, 60 percent of rice is used for the domestic market and 40 percent is used for trade. The categories of Thai rice uses can separate as following (Sowcharoensuk, 2024b):

- 30 percent of Thai paddy rice output is used for direct consumption.
- Paddy rice is used for industry and animal feed by about 25 percent.
- 5 percent of Thai's paddy rice is saved for the next planting.
- The remaining approximately 40 percent of Thailand's paddy output is for export or trade internationally.

As mentioned above, almost 40 percent of milled rice was exported to international markets with primary export destinations including Indonesia, South Africa, Iraq, the United States, China, the Philippines, and Malaysia in 2023. Thailand exports a diverse range of rice products, with the main export categories are white rice, parboiled rice, jasmine rice, broken rice, and glutinous rice (Sowcharoensuk, 2024b).

Figure 2.4 Thailand milled rice production, consumption and export in 2018 - 2023 (by volume, million tons)

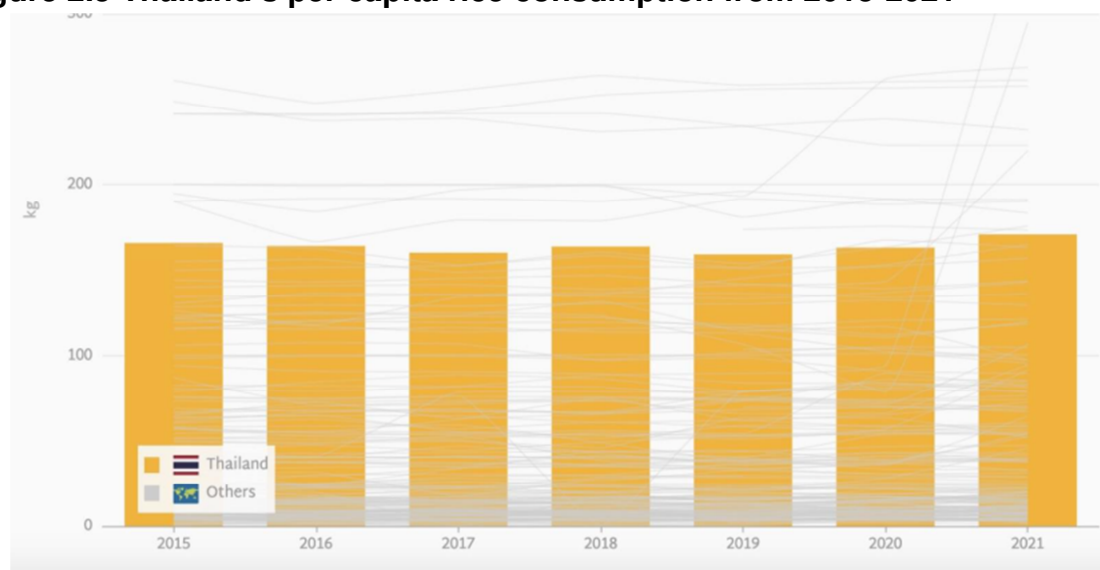


Source: Sowcharoensuk (2024b)

According to the chart above, Thailand's domestic rice consumption has remained consistently high and stable across recent years, underscoring rice's continued important role as a dietary staple. In contrast, industrial or non-food uses including animal feed account for only a small portion of total use. The *blue color* bars represent rice exports, which fluctuate depending on production volumes and global market demand. The *black line* shows ending stocks, or the quantity of rice remaining at the end of each marketing year. Notably, in the 2019/2020 marketing year (MY), both production and exports dropped sharply, primarily due to adverse environmental conditions such as drought. Despite these challenges, domestic consumption remained strong, reflecting the critical importance of rice to Thailand's food security.

In 2021, Thailand's per capita rice consumption was estimated at 171 kilograms per year, representing an increase from 165.6 kilograms in 2015, which is approximately a 3.2 percent comparing to 2015 (Helgi Library, 2023). Thailand's per capita rice consumption in 2021 is ranking as 14th out of 164 countries in terms of rice consumption per capita. This highlights the enduring significance of rice in both the Thai diet and the country's food security over years

Figure 2.5 Thailand's per capita rice consumption from 2015-2021



Source: Helgi Library (2023)

Rice preferences in Thailand are diverse, with a wide range of varieties of rice and consumed to match regional tastes and culinary practices. According to the Sustainable Rice Platform (SRP, 2023), Jasmine rice is the most preferred variety in the central region, while glutinous rice remains especially popular in other regions, accounting for 33 percent of total preferences among surveyed respondents (SRP, 2023).

Thai rice consumption generally falls into four main classifications, each comprising several sub varieties, as below:

- **Thai Hom Mali rice (Jasmine):** As mentioned, this type of rice originated in Thailand with an aromatic scent and it is very popular. A fragrant, long-grain with slightly sticky rice favored in the central region, often served with everyday meals. However, there are sub classify as following (Golden grain, 2019):
 - ❖ **Thai Hom Mali 105 (Khao Dawk Mali 105):** It is well-grown in Thailand, and its premium makes Thai rice an export product known worldwide, discovered in Chachoengsao province, which is the native rice found around the central region in Thailand and then widely cultivated in the northeastern region.
 - ❖ **Thung Kula Jasmine Rice:** Rice comes from the northeast which is one of the most prestigious and well-known types of Thai Hom Mali rice, recognized for its exceptional aroma, soft texture, and premium quality. Rice is protected under geographical Indication (*GI*) status both in Thailand and internationally.

- ❖ **Thai Pathumthani Fragrant Rice:** Another type of Jasmine rice which is nearly identical to Thailand's popular, top quality jasmine rice but said to be less fragrant than Hom Mali rice. It is grown mainly in the central region, especially in Pathum Thani province. Its major crop can be grown year-round (Chuchird et al., 2024).
- **Glutinous rice (Sticky rice):** Its texture is sticky and its grain is a short variety of rice. The popular production in the upper north and northeast region, especially among Isan communities, is typically eaten with hands and paired with grilled or spicy dishes.
 - ❖ **Glutinous Rice RD6** (Rice Department 6): is Thailand's most famous sticky rice variety, known for its aromatic, soft, and sticky texture, mainly grown in rainfed fields of Northeastern Thailand.
 - ❖ **Khao Wong Kalasin glutinous rice:** is a premium, high quality of *G/* certified sticky rice, grown in Kalasin province (Northeastern). Its characteristics are fragrant aroma, soft texture and non-hand-stick features (Office of Agricultural Affairs, 2022).
 - ❖ **Khao Niew Kiew Ngoo:** a variety, known for its soft, sticky texture and subtle aroma. a traditional native rice with a beautiful, slender and small seed. Even though it's not as widely commercialized as RD6, it is used to make some Thai desserts such as Mango sticky rice.
 - ❖ **Black Glutinous Rice:** Its rice color purple/black, is popular use in sweet or dessert menus, particularly in Southeast Asia, its benefits for preventing heart disease, reducing cholesterol and inhibiting the growth of cancer.
- **White rice (Polished Rice):** Thai white rice is also one of the long grained and non-sticky varieties, non-aromatic and less fragrant. This type of rice is grown throughout the nation, but the most popular is the central part of Thailand. Unlike Thai Hom Mali rice (Jasmine), White rice can be grown two or three times a year. There are two kinds of white rice consumed in Thailand.
 - ❖ **Khao Leuang Patew Chumphon:** It is a traditional or local rice variety with *G/* status from Chumphon province, in Southern Thailand. The seed has yellow and long shiny grain. Local farmers tend to grow there because this type is easy to grow for productivity, suitable areas and weather conditions.
 - ❖ **Khao Jek Chuey Sao Hai:** It is another one *G/* status rice from Sao Hai district, in Saraburi province, a part of central Thailand. respected with a traditional white Thai rice with cultural and historical value. One type of eating quality is aromatic.
- **Organic rice:** Another type of rice consumption within the country. Organic rice has an important role in the domestic market because it is a health conscious

market. The rice is highly nutritious because this kind of rice has not been husked yet. A high value of carbohydrates, high in vitamins, protein and fiber are components of this kind of rice. Its rice can have a brown, dark brown, red or dark red color.

- ❖ **Brown rice:** the brown rice or red rice colors, the rice is milled by machine by slightly removing the rice husk but keeping part of the rice germ and rice bran, it is more nutritious than white rice as it has 3-7 times higher fiber.
- ❖ **Riceberry Rice:** It is one popular type of rice eaten in Thailand, it is nutritious and a variety of rice which has succeeded in rice species improvement, which is a crossbreeding between Aromatic Black rice and Khao Dawk Mali 105. Its color is purple, also aromatic which is similar to jasmine rice (Thai rice premium export, 2025). This special purple rice species can be grown throughout the year.
- ❖ **Khao Mun Poo (Red Rice):** It is a type of rice that has reddish-brown rice colors, classified as brown rice with the same amount of fat as brown rice which is twice as high as polished rice. Its value is high nutrition.
- ❖ **Sangyod Rice Phatthalung (Sangyod GI Rice):** Sangyod rice is cultivated exclusively in Phatthalung Province, Southern of Thailand. The seed is small and red to dark color, the rice has higher nutritional value than other varieties of rice with high fiber, helping to slow down aging and many more other benefits for health (Thai rice premium export, 2025).

To conclude, the Thai population consumes rice as a food staple. Consumption patterns vary regionally, influenced by traditions of culinary and rice varieties cultivated in different areas. According to the Sustainable Rice Platform, Jasmine rice is the most consumption choice in the central region accounted about 84 percent of respondents, while glutinous rice (sticky rice) is preferred in other regions, especially in the northeastern and northern regions, accounting for approximately 33 percent of consumer preference (SRP, 2023).

2.4 Rice trade in Thailand and price variation

❖ *Thailand's rice exporting*

Thailand is among the world's leading rice exporters, recognized for its diverse range of high-quality rice varieties, including white rice, parboiled rice, jasmine rice (Thai Hom Mali), glutinous rice, and broken rice. Nevertheless, Thailand is positioning as the second-largest rice exporter globally, following India (OEC, 2023b). As shown in figure 2.6, in 2023, the total value of Thailand's rice exports reached approximately 5.2 billion dollars, representing an increase of about 14.71 percent compared to 2019. Between 2019 and 2021, the primary export destinations for Thai rice were the United States, South Africa, and China. In 2022, the leading markets shifted to the

United States, Iraq, and China. By 2023, the top destinations were Indonesia, the United States, and South Africa (OEC, 2023). Thailand's enduring competitiveness in the global rice market is largely attributed to its strong reputation for premium aromatic rice, particularly jasmine rice, which continues to gain high international demand.

Figure 2.6 Value of Thai rice exports worldwide, 2019-2023 (in billion dollar)



Source: OEC (2019-2023)

Thailand's rice exports value showed a fluctuation trend during 2019 to 2023, largely due to external factors (OEC, 2023b). In 2019, for example, drought conditions affected rice production in Thailand, which in turn influenced rice prices (USDA, 2020, p.2). Another factor contributing the increasing of Thai rice export in 2022 to 2023 was export the restrictions imposed by other major rice-exporting countries, particularly India (Childs, et al., 2024, p.21). In the effort to control domestic inflation, India implemented a ban on non-basmati white rice exports and imposed additional duties on other rice varieties. These measures led to global supply shortages, causing volatility in international rice prices and shifting trade flows. As a result, demand for Thai rice has increased, allowing Thailand to increase rice performance trade on a global level.

Table 2.3 Value of Thai rice exports worldwide, 2019-2023 (in billion dollar)

Year	Export value (Billion dollar)	Share of global export
2019	4.62	17.60%
2020	3.98	14.40%
2021	3.67	12.40%
2022	4.62	13.60%
2023	5.30	15.50%

Source: OEC (2019-2023)

Following data from the Thai Rice Exporters Association, Thailand's rice exports are classified into sub-quality of in varieties of white rice and Thai Jasmine rice, primarily based on the proportion of broken grains generated during the milling process. By separating sub-quality can publish clearer standardized price indexes or price benchmarks for each variety of rice. This classification influences both the market price and the overall value of the rice (TREA, 2022). The sub-qualities of rice exporting are classified as follows:

1. *White rice*: consisting of white rice 100 percent (%), white rice 5-10 percent (%), white rice 15-20 percent (%), white rice 25-35 percent (%) and white rice 40-45 percent (%).
 - Note: The percentage typically refers to the percentage of broken grains in the rice. i.e. white rice with 20–25 percent (%) means 20 - 25 percent (%) of the rice grains are broken rice from during the milling process.
2. *Thai Hom Mali rice (Jasmine rice)*: consisting of white Thai Hom Mali rice 100 percent (%), white Thai Hom Mali rice 100 percent (%) 5-10 percent (%) and white Thai Hom Mali rice 100 percent (%) 15-20 percent (%).
 - Note: The percentage refers to the percentage of broken grains in rice. i.e. white Thai Hom Mali rice 100 percent (%) is premium grade rice with 0–4% broken grains.

According to data from the Thai Rice Export Association (TREA) (table 2.8), Thailand's export volume of milled rice Thailand has exported increased steadily from the year 2020 up until 2024. For the year of 2024, Thailand has exported a total of 9.9 million tons of rice of all varieties. This also corresponds with a 42 percent increase from the 4.2 million tons compared to 2020 (TREA, 2025).

As the following table shows below, in 2024, the value of Thailand's rice exports reached approximately 6.22 billion dollars, marking an increase of about 3 billion dollars from 2020. However, as shown in the data, export value declined in 2021 despite a rise in export volume compared to 2020, with this drop was influenced by several factors, including currency fluctuations; the average exchange rate in 2021 was around 33 Thai baht per one dollar. Additionally, Thai rice faced strong pricing competition in the global market during the last quarter of 2021 which was Thai rice prices were lower than those of Vietnam rice but remained higher than India's rice (USDA, 2022, p.8).

Table 2.4 Rice (milled) export quantity (Metric tons), value (Million baht) and total value (Billions US dollars) in 2020-2024

Type of rice	2020		2021		2022		2023		2024	
	Quantity (MT)	Value (MB)	Quantity (MT)	Value (MB)	Quantity (MT)	Value (MB)	Quantity (MT)	Value (MB)	Quantity (MT)	Value (MB)
(1) White rice	2,243,163	37,119	2,502,782	39,370	3,863,709	60,352	4,826,624	88,410	5,757,326	121,641
(1.1) White rice 100%	833,834	16,146	969,034	17,572	2,462,588	39,462	1,732,140	32,695	1,990,677	46,046
(1.2) White rice 5-10%	1,030,087	15,300	1,292,823	17,993	1,070,898	15,626	2,517,785	45,261	2,536,096	51,883
(1.3) White rice 15-20%	20,250	372	22,993	382	53,332	865	63,523	1,216	55,184	1,154
(1.4) White rice 25-35%	3,405	53	19,631	248	14,933	217	242,910	4,332	984,550	18,469
(1.5) White rice 40-45%	1,475	21	2,300	30	2,032	34	4,801	87	4,000	80
(1.6) Other white rice	354,114	5,226	196,003	3,145	259,925	4,148	265,464	4,819	180,821	4,010
(2) Thai Hom Mali rice	1,189,752	40,999	1,151,251	32,097	1,253,398	38,053	1,321,814	42,840	1,438,402	49,308
(2.1) White Thai Hom Mali rice 100%	1,187,834	40,939	1,147,973	32,017	1,248,647	37,920	2,022,327	42,594	1,433,288	49,150
(2.2) White Thai Hom Mali rice 100% 5-10%	1,674	51	2,937	71	4,602	128	8,293	241	4,704	147
(2.3) White Thai Hom Mali rice 100% 15-20%	244	8	341	9	148	65	171	6	392	10
(3) Broken rice	590,727	9,752	743,744	10,413	804,884	12,042	1,022,381	17,318	1,296,727	23,834
(3.1) White broken rice	195,277	2,605	302,457	3,924	298,991	4,159	519,865	8,324	806,179	13,556
(3.2) White broken Thai Hom Mali rice	241,758	3,910	259,225	3,684	306,422	4,615	344,874	5,873	290,757	5,823
(3.3) Other white broken rice	153,692	3,537	182,066	2,805	199,471	3,271	157,643	3,121	199,792	4,365
(4) Glutinous rice	142,608	4,185	150,571	3,108	171,424	3,806	139,975	3,552	147,782	4,115
(5) Parboiled rice	1,441,924	21,026	1,474,847	20,596	1,511,031	22,088	1,376,229	24,030	1,263,547	25,285
(6) Husked (brown) rice	116,506	2,834	94,150	2,173	89,100	2,109	76,244	1,985	41,534	1,562
(6.1) Husked (brown) white rice	17,936	429	8,885	230	8,653	227	7,667	207	3,679	139
(6.2) Husked (brown) Thai Hom Mali rice	16,343	675	12,450	454	12,592	472	10,476	407	11,742	469
(6.3) Other husked (brown) rice	82,223	1,729	72,818	1,389	67,856	1,411	58,100	1,373	26,117	954
Total	5,724,680	115,915	6,117,346	107,757	7,693,545	138,452	8,763,265	178,136	9,945,323	225,656
Total value (Billion USD)¹		\$ 3.22		\$ 2.99		\$ 3.85		\$ 4.95		\$ 6.22

1. Convert currency estimated from Thai Baht to USD, 1 USD ≈ 36 Baht

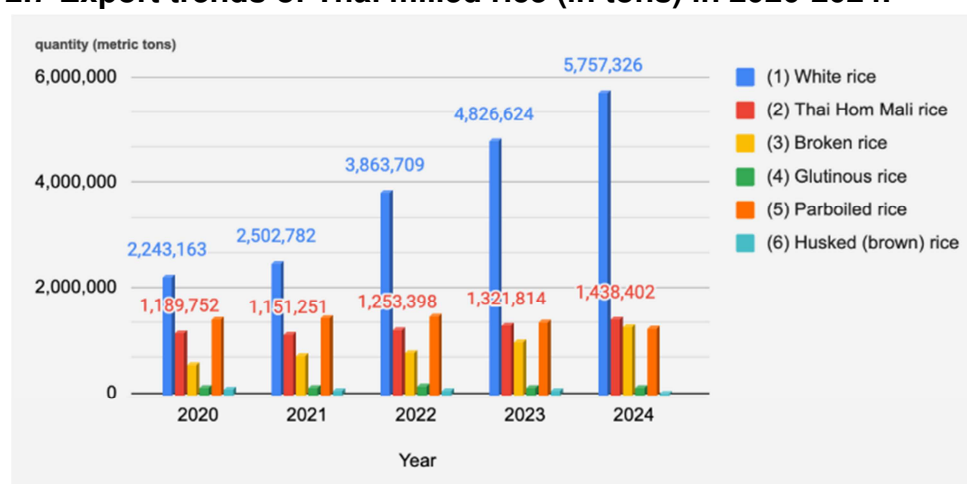
Source: TREA (2020-2024)

As data show in the table above, when comparing between export rice quantity and value, Thai Hom Mali rice (or Jasmine rice) demonstrates a markedly higher value per unit than other types of rice such as white rice despite being exported in significantly lower quantities. For example, white rice and parboiled rice in 2022, its

export value was significantly higher relative to volume, and Jasmine rice accounted for 16.29 percent of total export volume but contributed 27.48 percent of the total export value. In contrast, white rice made up the largest share by volume at 50.22 percent but generated a lower value proportion with 43.59 percent (TREA, 2022). This reflects the premium price and high market demand for Thai Jasmine rice in international markets.

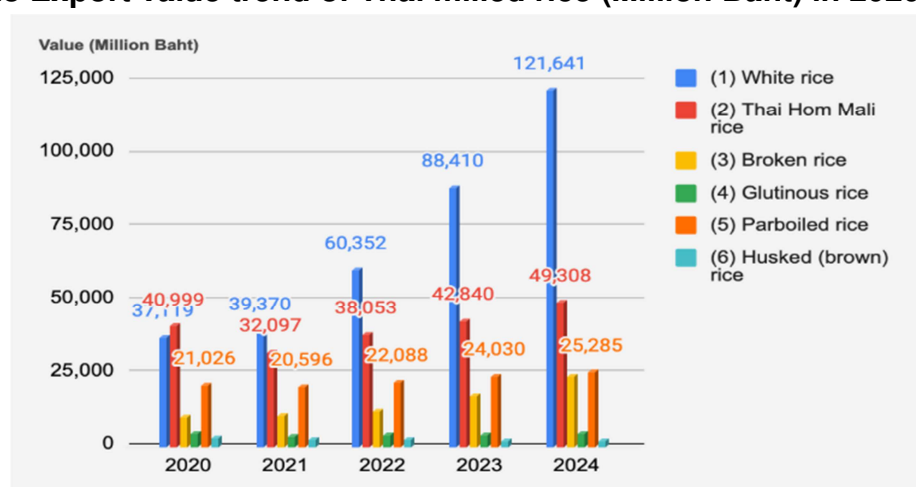
Parboiled rice also accounted for a substantial share of Thailand's rice exports in 2022, representing approximately 19.64 percent of the total export volume, while its value contribution at 15.95 percent. This was followed by broken rice, which made up 8.69 percent of the export value. Glutinous rice contributed 2.74 percent, and husked (brown) rice, for a niche health-conscious market, accounted for 1.52 percent of the total export value (TREA, 2022).

Figure 2.7 Export trends of Thai milled rice (in tons) in 2020-2024.



Source: TREA (2020-2024)

Figure 2.8 Export value trend of Thai milled rice (Million Baht) in 2020-2024.



Source: TREA (2020-2024)

As data shown above, this trend continues through 2024, where white rice exports reached 5.76 million metric tons valued at 121,641 million baht, compared to Jasmine rice's 1.44 million metric tons valued at 49,308 million baht (TREA, 2025). These figures underscore the premium status of Jasmine rice in international markets, where its aromatic quality and branding allow it to command higher prices.

❖ *Thailand rice import*

As Thailand is one of the world's leading rice exporters, its rice import volume remains relatively limited. The country maintains high domestic rice production, ensuring self-sufficiency for domestic consumption and surplus for export. Hence, most of the rice imported into Thailand tends to be in small quantities or volume to serve niche demand and serve specific purposes in Thailand such as re-export or demand on premium rice varieties. This reflects on Thailand's strategic focus on maintaining its dominance in the global rice market.

In 2023, in terms of value trade, Thailand imported about 9.71 million dollars from the world market, marking as the 143rd largest importer of rice (out of 223 countries) in the world, accounting for 0.028 percent of world's share importing of rice. Therefore, Thai rice imports made up about 0.18 percent of the value of rice exports. During the same year, its import of rice primarily from India was 2.55 million dollars, Japan 2.38 million dollars, Burma 2.06 million dollars, Pakistan 1.43 million dollars, and Australia 294 hundred thousand dollars (OEC, 2023b).

The same year, Thailand imported rice primarily consisting of semi-milled or wholly milled rice, accounted for 97 percent of imports valued and approximately 12.3 million dollars. Husked (brown) rice followed, accounted 2.12 percent with the imports value of 269 thousand dollars, while broken rice imports were small, with valued about 195 dollars (Trend Economy, 2024). The reasons for these imports include culinary preferences such as the demand for Japanese rice varieties not grown domestically, industrial use and economic factors.

2.5 Variation in rice prices in Thailand

Rice prices in Thailand closely follow global pricing trends through international benchmarks. Over time, these prices have fluctuated due to several key factors, including shifts in currency exchange rate in Thai baht, domestic production, changes in global demand, and weather-related challenges such as the severe drought in 2019 (USDA, 2020), when rainfall dropped to critically low levels.

Government policies have also played a significant role, including export restrictions like those imposed by India between 2022 and 2023, which had a notable impact on global rice prices during that period (Child N, et al., 2024). Several of these factors contribute to fluctuations in global rice prices, which in turn have a direct impact on rice prices in Thailand.

According to the Food and Agriculture Organization of the United Nations (FAO, 2025b) (table 2.5), rice prices in Thailand showed varying trends between 2020 and 2024. The price of Thai Fragrant rice (Jasmine rice) demonstrated a consistent year-on-year increase. In 2024, it reached 960.80 dollars per ton, up from approximately 792 per dollar per ton in 2021 which is an increase of 168 dollars, or about 21.21% over three years (FAO, 2025b).

In contrast, other rice varieties such as white rice and parboiled rice experienced price fluctuations between 2020 to 2023. However, by 2024, the prices of all major rice types in Thailand had risen, reflecting increased demand and the strong market position of Thai rice in international markets.

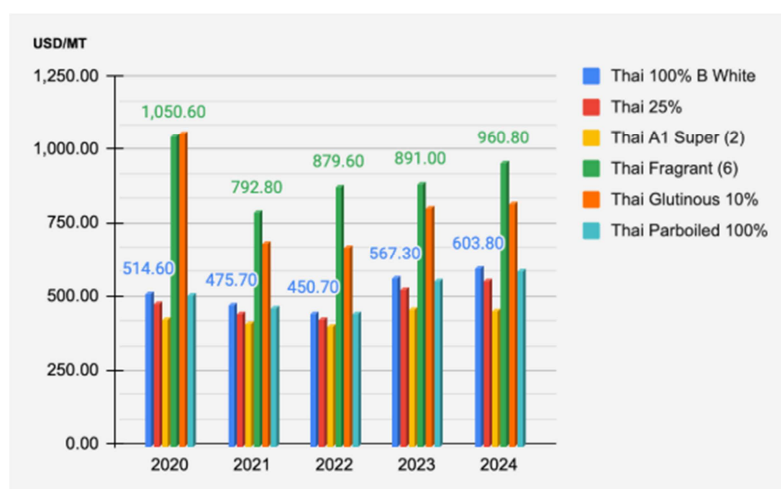
Table 2.5 The selected international price of rice from 2020 - 2024 (USD/Metric ton)

Type of rice	2020	2021	2022	2023	2024
Thai 100% B White	514.60	475.70	450.70	567.30	603.80
Thai 25%	482.90	449.60	429.10	532.10	559.90
Thai A1 Super (2)	431.00	415.40	405.40	462.20	460.70
Thai Fragrant (6)	1,050.60	792.80	879.60	891.00	960.80
Thai Glutinous 10%	1,064.00	686.20	672.30	808.70	823.30
Thai Parboiled 100%	512.30	470.20	450.70	558.60	594.20
Cambodia Fragrant 5% (5)	873.90	767.50	789.40	844.70	932.60
India Pusa Basmati	1,104.40	1,143.40	1,389.30	1,537.80	1,293.10
India 25% (7)	363.00	360.90	344.80	422.10	446.90
India Parboiled 5%	373.80	369.00	369.60	433.40	513.30

Note: (2) White broken rice (6) Hom Mali rice grade A (5) Phka Malis/Phka Rumduol (7) The July 2023 value refers to prices in the first two weeks of the month only.

Source: FAO (2025b)

Figure 2.9 The international price of Thai's rice export, 2020-2024 (USD/Metric tons)



Source: FAO (2025b)

As mentioned earlier, one of the key factors influencing Thai rice prices was the severe drought in 2019, which affected water availability and reduced output in market year 2019/2020 with limited acreage in the off-season (Na Prang) (USDA, 2020, p.4). As a result, rice prices began to rise gradually, driven by lower supply and increasing global demand. In addition, during late 2022 to 2023, Thai rice prices surged again, largely due to export restrictions imposed by the India government, which tightened global rice supply (Childs N, et al., 2024).

Chapter 3: Jasmine rice in Thailand

3.1 Background of Jasmine rice

Jasmine rice is a long-grain, fragrant variety of rice belonging to the monocot species *Oryza sativa* and is classified as one of the aromatic Indica types. It is widely cultivated across South and Southeast Asia (Thailand Foundation, 2021), with intensive cultivation in Thailand, Cambodia, Laos, and Vietnam. Renowned for its distinctive pandan-like aroma, the rice features a soft, slightly sticky texture and a subtle natural sweetness when cooked. These unique qualities have made Jasmine rice a preferred staple in regions across the international culinary market (Market research intellect, 2024). Valued for its culinary appeal, nutritional content, and high quality, Jasmine rice has grown in popularity and is now consumed worldwide. Building on the broader context of the rice sector presented in the previous chapters, this chapter focuses specifically on Jasmine rice (or *Khao Hom Mali*) in Thailand.

❖ *The Origin of Jasmine rice*

Jasmine rice, also known as Hom Mali, originated in Thailand and was first discovered around 1945 by a farmer in Chonburi province, located in the eastern region of the country and the new rice simple known as Jasmine rice 105 or "*Khao Hom Mali 105*" (Santanachote, 2024). In 1951, the rice seed was taken for cultivation also in Bang Kua district of Chachoengsao province, in the eastern region. Shortly thereafter, seeds were sent to a district agricultural officer and transferred to an experimental paddy field in Lop Buri province, which is situated in Thailand's central region in 1953. Eventually the experiment was successful, and the rice seed began to spread and was widely cultivated in the northeastern and northern regions of Thailand.

Among all regions in Thailand, the northeastern region has proven to be the most suitable for cultivating Jasmine rice, particularly the Hom Mali variety. In 1959, this rice variety was officially approved by the Ministry of Agriculture and named as 'Khao Dawk Mali 105' (KDML 105) (Thailand Foundation, 2021). Following its approval, the seeds were distributed to farmers across the country. Within a few years, farmers in Surin province which is located in the Isaan region began adopting KDML 105, leading to its rapid rise in popularity, the variety soon became the dominant crop cultivated in the "Thung Kula Rong-hai" area, an expansive region covering approximately 3,200 square kilometers across five provinces: Surin, Maha Sarakham, Yasothon, Sisaket, and Roi Et (Thailand Foundation, 2021).

Hom Mali rice refers to Thai Jasmine which is named for its color instead of its fragrance, as it is reminiscent of white jasmine blossoms or from white petals of the jasmine flower (Nguyen, 2025). Today, Jasmine rice is primarily grown in Thailand and particularly in the northeastern (Isaan) region of Thailand. While sticky rice remains the staple food for most people in Northeastern Thailand, the region is also known for cultivating the Jasmine rice variety KDML105 for commercial purposes and Jasmine rice has become one of the most renowned and widely appreciated rice varieties globally (Lin et.,2013).

Jasmine rice of RD15 (also known as Kor Khor 15) is recognized, alongside KDML105 (Hom Mali 105), as one of the officially designated varieties of Thai Jasmine rice due to its aromatic qualities and cultivation standards (The royal Thai consulate-general Shanghai, 2023).

Another main fragrant type of Jasmine rice is *Pathum Thani 1 rice*, are sometimes marketed alongside Jasmine rice domestically but are generally classified as different fragrant rice varieties which developed from KDML105 later in 2000 (Samabuddhi, 2004).

Table 3.1 Three main varieties of Jasmine rice in Thailand

Variety Name	Full Name (Thai)	Year Released	Main Cultivation Regions	Key Characteristics
KDML105	ขาวดอกมะลิ 105 (Khao Dawk Mali 105)	1959	Northeastern Thailand (e.g., Ubon Ratchathani, Surin, Sisaket, Yasothon)	Long grain, soft texture, strong aroma, high export demand
RD15	กข15 (Kor Khor 15)	1978	Northeastern & Northern Thailand	Similar aroma to KDML105, earlier maturity (shorter growing period), smaller planting area
Pathum Thani 1	ปทุมธานี 1 (Pathum Thani 1)	2000	Central Thailand (Pathum Thani)	Aromatic, softer texture, shorter growth cycle, mainly for domestic consumption

Source: Compiled by the author

❖ *Jasmine type (processing term) and its nutrition*

In Thailand, Jasmine rice of the same species is available in two main processing forms, distinguished by the degree of processing, which results in differences in their characteristics: white Jasmine rice and brown Jasmine rice. White Jasmine rice, once cooked, is known for its soft texture, slightly sticky consistency and giving a

good taste, while brown Jasmine rice retains the bran layer, offering higher nutritional value (Nguyen, 2025). Brown Jasmine rice is a good source of dietary fiber and magnesium, contributing additional health benefits compared to the white variety. White Jasmine rice has a glycemic index (GI) approximately in the range of 60 to 80 (Wasan et al., p.5, 2022). However, both types give a good scent with amazing texture.

Both types of Jasmine rice offer distinct nutritional benefits, and their consumption largely depends on individual dietary preferences. The nutritional content in 100 gram (1 cup) of cooked Jasmine rice composition of nutritional benefit presented in table 3.2 as below.

Table 3.2 Nutritional composition of a cooked cup (of 100 grams) Jasmine rice.

Rice type	Serving Size	Calories	Protein	Carbohydrates	Total fat	Others
White Jasmine rice	100 g.	200 cal.	4.2 grams	44.5 grams	0.44 grams	Fiber, Vitamin B1, D, Iron, Thiamine and selenium
Brown Jasmine rice	100 g.	297.5 cal.	7 grams	63 grams	2.6 grams	Fiber, Iron, vitamin B1, B3, B9, calcium and potassium

Source: Nguyen (K-Agriculture) (2025)

As shown in the above table, brown Jasmine rice contains higher calories (297.5 calories) compared to white Jasmine rice (200 calories), largely due to its higher carbohydrate, protein and also has a higher fat content compared to white Jasmine rice. In terms of micronutrients, both types provide other benefits such as fiber and essential vitamins and minerals, but brown Jasmine rice offers more diverse nutrients, including vitamin B1, B3, B9, calcium, and potassium. It shows that while white Jasmine rice is softer and preferred for its texture and aroma, brown Jasmine rice may offer greater health benefits due to its more complete nutritional profile.

3.2 The importance of Jasmine rice for Thailand's economy

Thai Jasmine rice or "*Hom Mali*" rice holds significant importance for both Thailand's economy and cultural heritage. It plays a vital role in contributing to the national economy and holds a strong presence in the international market. As a key agricultural commodity, Jasmine rice generates substantial income for producers and enhances the country's trade balance. Its high quality and distinctive characteristics have positioned Thai Jasmine rice as a premium product globally, making it one of the country's leading export goods. Furthermore, its cultivation provides a livelihood for millions of Thai farmers, particularly in the northeastern region, where Jasmine rice farming is most prominent.

In recent years, the global rice market has become increasingly dynamic, driven by rising global demand, shifting supply trends, global competition, technology advancement and external factors such as government interventions and climate change. Moreover, export restrictions and trade tariffs also play a significant role in shaping global rice flows. These evolving global conditions have had a direct impact on Thailand's trade balance and have created challenges for Thai rice farmers, who face growing uncertainty in both production and market access.

According to data from the Thai Rice Exporters Association (TREA, 2025), Jasmine rice having the highest export value among Thai rice varieties. Since 2003, the average export price of Jasmine rice grade A (or premium) has been approximately 491 dollars per metric ton. Over the years, rice prices have shown fluctuations. However, as of July 2025, the average price of milled Jasmine rice premium quality increased to 1,019 dollars per metric ton (TREA, 2025). This significant increase highlights the sustained global demand for Thai Jasmine rice and reprinted its critical value for the country's rice production sector.

Table 3.3 Average Jasmine rice price in 2003-2025 (USD per metric tons)

Average F.O.B Price USD per MT (milled basis)				
Year	Thai Hom Mali Rice Grade A	Thai Hom Mali Rice Premium Quality	Thai Jasmine Rice	Note: (Rice crop year)
2003	491.00	-	-	-
2004	489.93	-	-	-
2005	423.90	-	-	-
2006	494.67	-	-	Crop 2005/06
2007	578.35	-	-	Crop 2006/07
2008	920.00	-	-	Crop 2007/08
2009	963.36	-	-	Crop 2008/09
2010	1,046.91	-	-	Crop 2009/10
2011	1,054.85	-	-	Crop 2010/11
2012	1,099.89	-	-	Crop 2011/12
2013	1,190.99	-	-	Crop 2012/13
2014	1,045.38	-	-	Crop 2013/14
2015	905.63	-	-	Crop 2014/15
2016	776.15	-	-	Crop 2015/16
2017	-	852.71*	604.03	Crop 2016/17*
2018	-	1,171.14*	774.50	Crop 2017/18*
2019	-	1,225.95*	715.35	Crop 2018/19*
2020	-	1,057.33*	698.13	Crop 2019/20*
2021	-	793.59*	668.69	Crop 2020/21*
2022	-	889.07*	667.49	Crop 2021/22*
2023	-	896.00*	716.00	Crop 2022/23*
2024	-	997.29*	864.13	Crop 2023/24*
2025	-	1,019.00*	779.00	Crop 2024/25*

Note: * refers to crop year of milled rice. The definitions for rice categories, including Thai Hom Mali (Jasmine) rice: Premium Quality, 100%, and Thai Jasmine rice general or all grades.

Source: TREA (2025)

As previously mentioned, Thai Jasmine rice is primarily cultivated in the northeastern and central plains regions of Thailand. In the northeastern (Isaan) region, the rice is grown predominantly with rainfall conditions, making it more vulnerable to climate variability. In contrast, the central region relies heavily on irrigated systems, allowing for more stable and higher yielding rice production. As a result, rice cultivation in the irrigated central region plays a more significant role in ensuring national food security compared to the rainfed systems of the northeast (Jirapornvaree et al., 2021). In the central region of Thailand, Jasmine rice is commonly cultivated in the name of “Hom Pathum Thani”, a variety suited for irrigated conditions. Meanwhile, in the northeastern region, Jasmine rice “KDML105” and sometimes “RD 15” is primarily grown under rainfed conditions, particularly in the “Thung Kula Rong-Hai” area, which covers five provinces in Isaan region (Jirapornvaree et., 2021). Thai rice cultivation grown under the rainfed condition accounts for approximately 85 percent of all rice production (Jirapornvaree et., 2021).

❖ Jasmine rice on Thailand's economic structure

Thailand's agriculture sector contributes approximately 8 percent to the country's gross domestic product (GDP), yet it plays two crucial roles: first, as a primary source of food supply, and second, as a major provider of employment which approximately 30 percent of Thailand's population was employed in the agriculture sector and it contributed around 17 percent of the country's total export (ACIAR, 2025). Though aggregate GDP reports often do not single out rice, it remains a central contributor within Thailand's crop sector. According to the Food and Fertilizer Technology Center for the Asian and Pacific Region (FFTC) rice production accounts for approximately 15 percent of the country's agricultural GDP which is the first ranking among agriculture products (FFTC-AP, 2018).

According to data from the Food and Fertilizer Technology Center for the Asian and Pacific Region (FFTC), Thailand's economy heavily depends on exports, which contribute approximately 60 percent of the country's total GDP (FFTC-AP, 2018). Agricultural exports make up around 20 percent of that total, with rice ranked as second of the most valuable agricultural exports followed by rubber (FFTC-AP, 2018). Internationally, Thailand ranks as the second-largest rice exporter in terms of market share (OEC, 2023b).

This study focuses on Jasmine rice (*Khao Hom Mali*), which holds a distinctive place in Thailand's agricultural and economic landscape as it is one of Thailand's most valuable agricultural exports in rice.

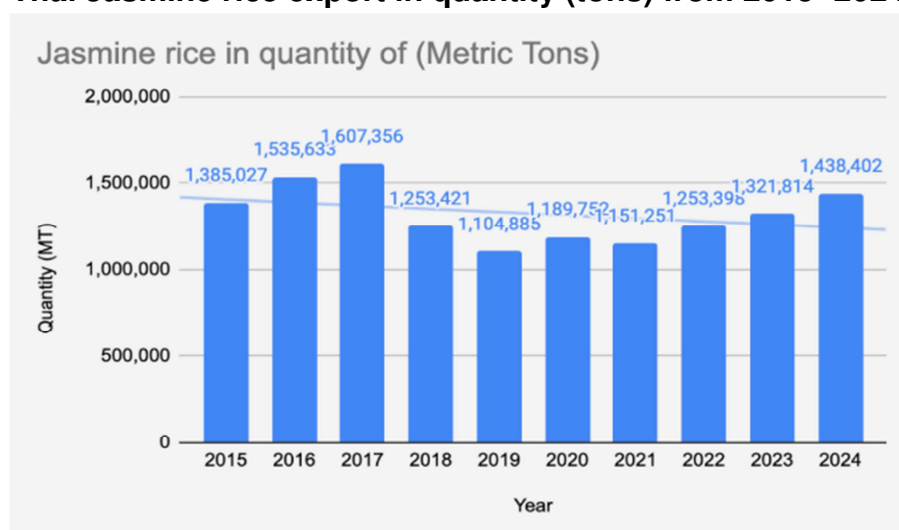
Its production is deeply linked with rural livelihoods, particularly in the northeastern region where rainfall farming is predominant. Beyond its cultural and dietary significance, Jasmine rice contributes meaningfully to the nation's export earnings, rural employment, and national food security. This is how Jasmine rice functions not only as a staple crop, but also as a strategic economic asset within Thailand's economic structure.

❖ *Jasmine rice in Thailand's Export Economy*

According to the Thai Rice Exporters Association (TREA), the export trend of Thai Jasmine rice has fluctuated over the past decade due to various factors, including weather conditions, exchange rate volatility, shifts in global demand, and the impact of the COVID-19 pandemic, all of which have affected both production and export performance.

As shown in Figure 3.1, Thai Jasmine rice exports increased between 2015 to 2017, it was increasing from approximately 1.38 million metric tons in 2015 to at highest of 1.60 million metric tons in 2017 (TREA, 2025). This growth correspond with strong international demand and favorable weather conditions. Notably, in 2017, annual rainfall reached approximately 1,830 millimeters, which contributed significantly to improve in the production performance (USDA, 2020). However, beginning in 2018, export volumes declined sharply with 1.10 million metric tons in 2019. This downturn was largely attributed to drought conditions, as Thailand experienced reduced precipitation levels during that period (USDA, 2020).

Figure 3.1 Thai Jasmine rice export in quantity (tons) from 2015- 2024



Source: TREA (2015-2024)

From 2020 onward, a gradual recovery is shown. Exports increased from 1.15 million metric tons in 2021 to an estimated 1.44 million metric tons in 2024. Given the post Covid recovery. Thailand's regained market presence (TREA, 2025). In 2024 rice

exports rose closer to the historically recorded, further suggesting the strength of the agricultural economy (TREA, 2025). In 2024 data suggests a return to export volumes approaching earlier peak levels, which is a positive indicator for Thailand's agricultural economy.

The exchange rate has had a significant impact on the export value of Thai Jasmine rice. According to (Chuaykerd et al., 2020, p.1119), the demand for agricultural exports, particularly staple crops like rice, is inelastic. Therefore, when the value of the Thai baht decreases (resulting in a higher exchange rate), export prices go down, but the export value does not necessarily increase proportionally (Chuaykerd et al., 2020).

The value dropped in 2021, recording the lowest value at 32.10 million baht, these declines coincided due to high freight costs and logistics issues due to a lack of available shipping and eventually low global rice prices during this year (USDA, 2021, p.1).

In 2022, the rice market began to recover. In 2023, following India's rice export ban (Childs N, et al., 2024, p.21), Thai Jasmine rice exports is increased in both volume and value (42.84 billion baht). This recovery trend continues into 2024, with export value reach to 49.31 billion baht, which is the highest in the dataset. The increase reflects strong international demand, favorable pricing, and Thailand's regained competitiveness in premium rice markets.

Table 3.4 Jasmine rice quantity and value (Baht) from 2015 – 2024

Year	Quantity (MT)	Value (Million Baht)	Unit Price (Baht/MT)
2015	1,385,027	44,861	32,389.98
2016	1,535,633	42,316	27,556.06
2017	1,607,356	41,919	26,079.47
2018	1,253,421	45,294	36,136.30
2019	1,104,885	40,662	36,802.02
2020	1,189,752	40,999	34,460.12
2021	1,151,251	32,097	27,880.11
2022	1,253,398	38,053	30,359.87
2023	1,321,814	42,840	32,410.01
2024	1,438,402	49,308	34,279.71

Source: TREA (2015-2024)

Overall, the export value of Thai Jasmine rice demonstrates that volume alone could not determine economic return. But also market conditions, global competition, pricing or exchange trends, and trade disruptions such as India's 2023 export ban have significantly shaped the monetary value of Thailand's Jasmine rice exports over the last decade.

❖ *Government policy on Thai Jasmine rice*

Government policy plays a critical role in shaping the development and competitiveness of Thailand's Jasmine rice sector. As one of the country's most valuable agricultural exports, Thai Hom Mali rice has received sustained attention from policymakers aiming to enhance production quality, stabilize farmer incomes, and strengthen international market presence. Over the years, the Thai government has implemented a range of policy instruments such as the rice price guarantee scheme in 2020/2021 (crop year) which provides compensation to farmers if the market price of rice prices drops below the guaranteed benchmark (FFMA, 2020a). In 2017, the Thai government resumed the release of rice stocks that had been suspended in 2016, as part of its strategy to manage rice prices and prevent market oversupply, which could lead to price declines (FFMA, 2020b). Additionally, the Thai government is also supporting sustainable production practices in Jasmine rice cultivation (Agriculture and Food Cluster Team, 2018). The policies aim to improve environmental outcomes and farm livelihoods while enhancing the global competitiveness of Thai rice.

"Thailand's rice-pledging scheme" was one of the policies, also known as "paddy pawning," was introduced in 2011-2014 with the aim of increasing farmer incomes by purchased paddy rice at price significantly above about 40-50 percent higher than the market levels from the farmers. Under the scheme, the government offered up to 15,000 baht per metric ton for white rice and as much as 20,000 baht for Jasmine rice (Namchaidee, 2017, p.14). The concept involved farmers receiving receipts for their produce, which they could redeem for cash at the Bank for Agriculture and Agricultural Cooperatives (BAAC). The rice later was sent to millers to process the paddy into milled rice, which was subsequently delivered to government warehouses. However, due to limited storage capacity in government silos, the Thai government had to hire millers to store the milled rice. Nevertheless, the government had to carry the transportation cost and hired surveyors to inspect the quality of rice (Namchaidee, 2017, p.15). After Thailand's rice-pledging scheme, the implementation of this policy led to considerable controversy, particularly regarding its long-term economic and social impacts. From an economic perspective, the policy raised concerns about sustainability, as it reduced incentives for farmers to improve rice quality. Socially, although the policy was intended to support farmers, some experts argue that the benefits did not reach them as effectively as expected (Namchaidee, 2017, p.18). Eventually, the rice-pledging scheme came to an end in 2014.

To conclude, while this program such guaranteeing favorable prices and raising short term, it later imposed substantial challenges. It caused high levels of market distortion, a loss of export competitiveness, high levels of government spending due to the unsold stockpiles of rice, and most severely and showcasing the policy's absence of sustainability.

❖ Jasmine rice and the livelihood of Thai farmers

Jasmine rice (*Khao Hom Mali*) is more than just a premium export product, but it is also a fundamental pillar of rural livelihoods in Thailand, particularly across the northeastern (Isan) region. Jasmine rice plays a decisive role in household income, food security, and social stability. Most farmers cultivate Jasmine rice typically under rainfed conditions which makes their welfare highly concentration sensitive to seasonal weather and market fluctuations.

In the case of small and large jasmine rice farmers in Thailand, their income is determined by a multifaceted array of factors. Determining the jasmine rice market price exerts hefty influence, but it certainly is not the most crucial. Farmers earnings can also be determined by the following attributes; yield produced in a specified area, total cost of production which includes seeds, fertilizers, labor and machinery, irrigation, prevailing weather and even after harvest activities. Moreover, government policies and other external factors also influence market accessibility, demand and supply, and price changes, thus impacting farmers income.

In Thailand during the 2022/2023 crop year, approximately 5.2 million households or about 67 percent on total of agriculture sector are involved in the rice sector across all rice varieties, making rice cultivation one of the most widespread and significant agricultural activities in the country (Sowcharoensuk, 2024b). Although rice production has shown a gradual increase since 2021, and government support measures, particularly price support schemes are in place, many rice farmers continue to face financial challenges. High production costs, especially for labor and fertilizers, combined with limited bargaining power when selling paddy rice to traders and middlemen, significantly reduce farmers' overall income (Sowcharoensuk, 2024).

According to data from the Office of Agricultural Economics (OAE, 2025a), recently crop year in the 2023/2024, Thailand produced approximately 9.5 million tons of Jasmine rice (KDML 105 variety) during the main cropping season (rainy season *or Na pee*), with cultivation covering around 26.5 million rai (equivalent to 4.24 million hectares).

The northeastern region was the dominant production area, accounting for approximately 7.74 million tons, or 81.47 percent of the total national Jasmine rice output during the rainfall season (OAE, 2025a).

The rice variety of RD15 (Kor Khor 15) is also officially classified as a Jasmine rice variety, it is less commonly cultivated and consumed compared to KDML105 (Khao Dawk Mali 105). KDML105 remains the predominant variety in Thailand's Jasmine rice production, owing to its longer history of cultivation and stronger market demand. In the 2023/2024 crop year, the Jasmine rice in a variety of RD15 alone accounted for approximately 0.82 million tons of production, cultivated on around 2.05 million rai (equivalent to 327,390 hectares) (OAE, 2025a). Also this variety of rice is most cultivated in the Northeastern of Thailand.

According to the Office of Agricultural Economics (2025), in the 2023/2024 crop year, the average yield of Jasmine rice (KDML105) after harvesting was approximately 373 kilograms per rai (equivalent to 0.16 hectares). In comparison, the RD15 variety produced a slightly higher average yield of 406 kilograms per rai (OAE, 2025a). However, Thailand's average rice yield per rai (equivalent to 0.16 hectares) remains lower than other countries. For instance, Vietnam averages around 1,000 kilograms per rai, while China achieves 1,000 to 1,200 kilograms per rai (The nation Thailand, 2024).

To calculate the yield of the Jasmine rice variety KDML105 per hectare, it is important to note that 1 hectare is equivalent to 6.25 rai. Given that the average yield of KDML105 is approximately 373 kilograms per rai (OAE, 2025a). The estimated yield per hectare of Jasmine rice (KDML105) can be calculated as follows:

- $373 \text{ kg/rai} \times 6.25 \text{ rai/hectare} = 2,331.25 \text{ kg/hectare}$

Therefore, the yield of Jasmine rice (KDML105) is approximately *2,331 kilograms* per hectare.

Given the rice yield, farmers have the opportunity to sell their rice after the harvest season, typically between April and July, when market prices tend to rise, thereby potentially increasing their income and maximizing profits (Srisompun et al., 2019, p. 81). However, in practice, most farmers choose to sell their rice immediately after harvesting rather than waiting for higher prices. This behavior is influenced by several key factors. First, labor shortages often compel farmers to rely on mechanization for cultivation and harvesting. Second, freshly harvested rice requires drying before it can be stored, and many farmers lack access to adequate labor or rice drying facilities.

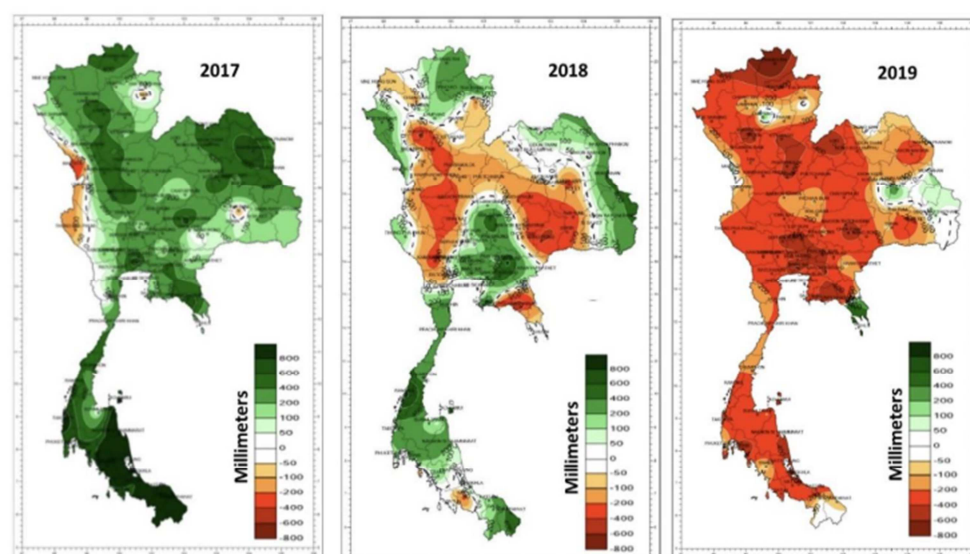
As a result, they are unable to store their rice and are forced to sell it right away. Furthermore, for households where farming is not the primary source of income, particularly among those engaged in non-agricultural occupations, there is often little incentive to invest additional time or resources into post-harvest management. This leads to a preference for quick sales over strategic storage for higher returns (Srisompun et al., 2019, p. 81). Hence, even with support provided by government, farmers selling immediately after harvested at a lower price is often a practical choice driven by labor need after harvesting process such as drying facility, financial flow or instant payment, avoiding risk management, and storage costs.

As previous mentioned, the adoption to modern agricultural machinery has contributed to rising rice production costs. To cover these expenses, many farmers are forced to borrow money, not only for cultivation but also for other household needs. Consequently, the pressure to repay debts becomes a significant factor influencing farmers' decisions to sell their rice immediately after harvest, rather than storing it for potentially higher prices later (Srisompun et al, 2019, p. 81).

❖ *Weather condition challenge on Thai Jasmine rice farmers*

In recent years, extreme weather events such as prolonged droughts, irregular rainfall, and unexpected floods have increasingly affected rice production cycles. For instance, during the year 2019/2020 crop year, severe drought in Thailand significantly reduced the yield of Jasmine rice. Around half of the farmers in the affected area from drought during off-season have received financial assistance from the government totaling 624 million baht (20 million dollars) (USDA, 2020, p.6). Regarding this, rainfall levels in key Jasmine rice-growing areas were well below average, resulting in crop failures and lower grain quality.

Figure 3.2 Precipitation anomaly in 2017-2019



Source: USDA (2020)

In 2015, Thailand faced one of its most severe droughts in decades, significantly affecting rice production across the country (USDA, 2020, p.6). The drought extended to 49 out of the 77 provinces, leading to a decline in rice yields due to below-average rainfall and insufficient water resources (Bangkok Post, 2014).

3.3 Jasmine rice production in Thailand

As mentioned in all data above, the production of Jasmine rice in Thailand is influenced by various factors including weather conditions, land and water availability, government policies, and global market dynamics. With relatively lower yields compared to other rice varieties, Jasmine rice cultivation relies heavily on traditional farming practices and is often more vulnerable to environmental or weather fluctuations.

❖ Thai Jasmine rice production

As the data showed earlier, in Thailand, the most well-known three main varieties of Jasmine rice are KDML105 (*Khao Dawk Mali 105*) and RD15 (*Rice Department 15*) (Thailand Foundation, 2021). Both are valued for their distinctive fragrance; however, KDML105 dominates national production, accounting for the majority of Jasmine rice output, while RD15 is cultivated on a smaller scale and contributes a relatively minor share of total production. Another new developed fragrant rice types are *Pathum Thani rice 1 (also called Hom Pathum)*, is a newly Thai fragrant rice developed from Kao Dok Mali 105 (KDML105) rice in 2000, The rice is high grade less fragrant which share similarity to jasmine rice (Thai Hom Mali rice) (Samabuddhi, 2004). The rice is mainly cultivated in central provinces which are rich in water resources and irrigation under Thailand's Geographical Indication (GI) protection (Klaiwichit et al., 2025). This GI rice variety shared less proportion in export term and in rice production.

In Thailand, among the three main Jasmine rice varieties, Hom Mali 105 (KDML105) is the most widely cultivated and it holds the largest share in international trade. According to data from the Office of Agricultural Economics (OAE, 2024a), during the main season, KDML105 cultivation in the Northeastern region accounted for approximately 81 percent of Thailand's total Jasmine rice production in the 2023/2024 crop year (OAE, 2025a). This represents an increase of about 0.4 million tons, or 4.24%, compared to 2020. The Northeastern region serves as the principal production area for Jasmine rice in Thailand.

The focus is on the Jasmine rice variety, KDML 105, which is the most popular and the main export driving the Thai rice economy. The area of land devoted to Jasmine rice has been slightly increasing since 2020. In 2020, approximately 26.15 million rai (about 4.18 million hectares) were used for Jasmine rice production. By 2024, the land dedicated to the main Jasmine rice variety, KDML 105, is projected to reach about 26.56 million rai (approximately 4.25 million hectares), representing an increase of around 1.67 percent (OAE, 2025a).

Table 3.5 Jasmine rice quantity (tons) and area plant from 2020-2024 in the main season

Jasmine rice (Type)	2023/2024		2022/2023		2021/2022		2020/2021	
	Quantity (Tons)	Area plant (Rai)	Quantity (Tons)	Area plant (Rai)	Quantity (Tons)	Area plant (Rai)	Quantity (Tons)	Area plant (Rai)
KDML105	9,567,931	26,565,452	9,307,131	26,823,737	9,402,568	26,666,946	9,161,991	26,158,475
RD15	819,243	2,046,188	730,905	2,013,696	786,162	2,059,343	818,817	2,222,795
Pathum Thani 1	1,158,614	1,714,279	1,202,810	1,790,984	1,237,597	1,870,305	1,216,623	1,843,694
Northern region								
KDML105	1,323,277	2,790,588	1,337,219	2,878,487	1,320,825	2,954,970	1,232,069	2,674,123
RD15	152,771	318,737	137,414	288,821	117,466	243,089	140,550	297,874
Pathum Thani 1	282,933	443,077	302,419	468,076	299,482	472,105	289,570	469,266
Northeastern region								
KDML105	7,743,779	22,279,984	7,459,891	22,448,824	7,579,444	22,224,878	7,455,337	22,025,859
RD15	666,472	1,727,451	593,491	1,724,875	668,696	1,816,254	678,267	1,924,921
Pathum Thani 1	11,421	25,416	11,510	25,975	12,732	30,090	11,511	26,389
Central region								
KDML105	499,034	1,489,428	508,246	1,491,264	499,715	1,479,387	471,750	1,449,761
RD15	-	-	-	-	-	-	-	-
Pathum Thani 1	826,168	1,177,765	850,321	1,228,377	872,451	1,270,242	858,853	1,240,584
Southern region								
KDML105	1,841	5,452	1,775	5,162	2,584	7,711	2,835	8,732
RD15	-	-	-	-	-	-	-	-
Pathum Thani 1	38,092	68,021	38,560	68,556	52,932	97,868	56,689	107,455

Source: Office of Agriculture economics of Thailand (2020-2024)

As mentioned, Pathum Thani 1 rice is a newer fragrant variety, developed from KDML 105 in 2000, and is primarily cultivated in the Central region under irrigation. According to the Office of Agricultural Economics (OAE), the quantity of Jasmine rice grown in the off-season (also known as *Na Prang*) is relatively small compared to the main season. In 2023, the dry-season output of the Pathum Thani 1 variety was approximately 0.6 million tons, with most of this production are in the Central region (OAE, 2025b). This indicates that Jasmine rice is mainly produced during the main season, relying on rainfall, with most of the production occurring in the northeastern region of Thailand.

The table below (table 3.6) presents the number and percentage of rice-growing during the main season households in Thailand by farm size for the 2020/2021 crop year. In total, there were about 4.55 million rice-farming households nationwide. The Northeastern region had the largest share, accounting for roughly 3.03 million households (about two-thirds of the national total), followed by the Northern region with just over 1.02 million households. The Central and Southern regions had considerably fewer rice-farming households, with approximately 0.41 million and 0.08 million, respectively (OAE, 2020).

Table 3.6 Number and percentage of household growing rice (during the main season) in Thailand in 2020/2021

Number and % of rice growing households										
	< 2 rai	2 - <6 rai	6 - <10 rai	10 - <20 rai	20 - <40 rai	40 - <60 rai	60 - <100 rai	100 - <140 rai	>140 rai	Total
Percentage (%)	1.61	20.72	20.67	36.29	16.95	2.75	0.89	0.11	0.01	100
Household	73,198	942,494	940,380	1,650,958	771,204	124,747	40,448	4,827	475	4,548,731
Northern (%)	4.16	28.36	17.72	26.56	16.52	4.32	1.94	0.38	0.04	100
Household no.	42,699	290,942	181,784	272,470	169,467	44,277	19,937	3,912	439	1,025,927
Northeastern (%)	0.82	19.14	22.49	40.23	15.46	1.58	0.28	-	-	100
Household no.	24,826	580,517	682,307	1,219,812	469,148	47,993	8,574	-	-	3,033,177
Central (%)	0.3	9.92	13.53	34.81	30.57	7.76	2.88	0.22	0.01	100
Household no.	1,213	40,610	55,396	142,568	125,181	31,825	11,785	915	36	409,529
Southern (%)	5.58	37.97	26.08	20.12	9.25	0.81	0.19	-	-	100
Household no.	4,460	30,425	20,893	16,108	7,408	652	152	-	-	80,098

RAI is Thai traditional unit of area use in Agriculture: 1 rai = 0.16 hectares

Source: OAE (2020)

Most rice farmers operate on small to medium-sized plots. The largest proportion of households (36.29%) cultivate between 10-20 rai (equivalent to 1.6-3.2 hectares), followed by those with 2-6 rai (0.32-0.96 hectares) about 20.72% and 6-10 rai (0.96-1.6 hectares) accounted for 20.67%. Very few households farm in large areas above 100 rai or 0.12% combined. The data show that rice farming in Thailand is dominated by medium to smallholder farmers, with the Northeastern region as the country's primary rice production base (OAE, 2020).

❖ *Jasmine rice supply chain in Thailand*

Upon harvesting Jasmine rice, farmers are required to dry the paddy and make a decision to either store it or sell it immediately (Srisompun et al., 2019, p.80). Subsequently, the supply chain of Jasmine rice in Thailand encompasses multiple stages, including the milling process where husks and bran layers are removed. Followed by packaging and distribution through exporters to international markets. This intricate network involves various stakeholders working collaboratively to ensure the preservation of the rice's premium quality while fulfilling global demand. A comprehensive understanding of this supply chain is essential for effectively

addressing challenges related to production efficiency, quality assurance, and sustainable practices.

The rice supply chain, including that of Jasmine rice in Thailand, comprises three main segments as outlined as following (Sowcharoensuk 2019):

1. **Upstream segment:** This initial stage involves rice cultivation and harvesting by farmers, resulting in paddy rice that has not yet been milled. Due to limited storage capacity, most rice farmers opt to sell their paddy immediately after harvest. Often at lower prices during the harvest season (Srisompun et al., 2019). The paddy is typically sold directly to local mills, intermediaries such as agricultural cooperatives, paddy rice markets, or paddy rice collectors (Sowcharoensuk 2019).
2. **Intermediate segment:** This stage involves rice milling operations. Some are large mills rice industries may process paddy rice by removing the husk and bran layers, with a capacity of approximately 20 tons per day (Sowcharoensuk, 2019). Many of these mills operators are invest in advanced technology to enhance milling efficiency and improve rice quality. They often maintain their own storage facilities, benefiting from direct connections to the same commercial networks as exporters. In some cases, they operate under contracts with major exporters to mill or process rice for international markets, which strengthens their market position.
3. **Downstream segment:** This stage involves trading companies that purchase milled rice to packed rice for distribution in domestic and international markets. In some cases, sales are facilitated by intermediaries who act between rice mills and distributors (Sowcharoensuk, 2019). Activities in this segment include packaging, branding, logistics management, and compliance with international trade regulations.

Figure 3.3 Thailand rice supply chain (Including Jasmine rice)



Source: Sowcharoensuk (2019)

The structure above demonstrates the interconnected roles of farmers, intermediaries such as mill rice factors, and distributors in maintaining a steady flow of rice from production to final consumption, both domestically and internationally.

Thailand is the world's largest exporter of Jasmine rice. In 2019, its primary export destinations were led by the United States, which accounted for 33 percent of total Jasmine rice exports, followed by China and Hong Kong (Sowcharoensuk, 2019). Nevertheless, Thai Jasmine rice faces increasing competition from other countries producing similar high-quality fragrant rice varieties, such as India's Basmati rice, Cambodia's Jasmine and Phka Rumdoul fragrant rice, and Vietnam's KDM (Khao Dok Mali) and ST21 varieties which have comparable rice prices.

3.4 Thai Jasmine rice export and its price dynamics

Khao Hom Mali (Jasmine rice) has strong global demand. According to Krungsri research, the top three importers of Jasmine rice from 2018 to 2023 were the United States, followed by China, and then Hong Kong (Sowcharoensuk, 2019). As its recognized as a premium product in the international rice trade, its export performance is influenced by a complex set of market forces, including the role of middlemen and exporters, competition from other rice producing nations, and shifts in consumer preferences. Moreover, price volatility is driven by factors such as global supply fluctuations, currency exchange movements, and trade policies which pose significant challenges for farmers and exporters, impacting both profit margins and market competitiveness.

❖ Thai Jasmine rice demand and its export.

As shown in Table 3.7, the United States has consistently been the largest importer of Thai Jasmine rice from 2018 to 2023, followed by China, Hong Kong, Canada, and Singapore. The most recent data from 2023 confirms this trend, with the United States accounting for 41 percent of total Thai Jasmine rice exports, highlighting its position as the primary market for this premium product. This sustained demand from key markets not only reflects the strong reputation of Khao Hom Mali internationally (Sowcharoensuk, 2023). Additionally, it also plays a critical role in shaping export volumes and influencing price trends, which in turn affect the profitability and competitiveness of Thai exporters.

Table 3.7 Top Thailand Jasmine rice importers by countries (in percentage).

Jasmine rice importers				
Countries	2018	2020	2022	2023
USA	33.00%	41.00%	36.00%	41.00%
China	13.50%	11.60%	11.10%	13.50%
Hong Kong	11.80%	10.80%	10.40%	9.20%
Canada	5.70%	6.80%	7.50%	7.20%
Singapore	4.40%	5.20%	4.00%	3.80%
Others	31.60%	24.60%	31.00%	25.30%

Source: Sowcharoensuk (2019-2023)

According to the United States International Trade Commission (USITC) (2025), Thai Jasmine rice has been successfully positioned as a distinctive brand of aromatic rice, giving it a quality reputation that surpasses Vietnamese and Cambodian varieties, which have entered the global market more recently. This strong market positioning enabled Thailand to become the first internationally recognized supplier of Jasmine rice and to serve as the benchmark against which competing varieties are measured (USITC, 2025, p.226).

In 2025, the United States, under President Trump, imposed tariffs on rice imports from Thailand. The beginning settled the tariff at 36 percent, and later reduced following negotiations at the rate lowered to 19 percent, which effect August 1, 2025 (The nation, 2025). This action took place within the broader context of trade tensions and negotiations between the U.S. and Thailand regarding agricultural exports

Premium Thai Jasmine rice (Hom Mali) or its essentially variety of *KDML 105* which is a differentiated product holds a strong competitive advantage due to its unique identity and high-quality standards. For those primarily cultivated in the Northeastern region of Thailand, this rice commands higher farm-gate prices and greater export value compared to other white rice varieties and even other Jasmine rice (such as Pathum Thani 1 rice) (USITC, 2025, p.24). As a result, farmers in the Northeast often get higher returns and are able to offset the risks posed by rising input costs.

Another reason for its competitiveness is Thailand's position as the leading global supplier of high-value Jasmine rice. This dominance made significant export revenues, benefiting the entire Thai rice sector, including farmers, intermediaries and exporters. While exporters are capable of supplying a diverse range of rice products, they often face cost pressures in the more competitive white rice and broken rice in the global markets, where product differentiation is limited and profit margins are narrower compared to Jasmine rice (USITC, 2025, p.24).

However, Jasmine rice production faces challenges in many factors. Beyond weather conditions, high production costs are also one of aspect challenging producers. For example, fertilizers in Thailand account for approximately 30 percent of total input costs (USITC, 2025, p. 73). These high production costs can reduce profitability for farmers, making it more difficult to compete with other rice producing countries. Additionally, fluctuations in energy prices and input costs in the rice supply chain, including milling and transportation can contribute to price volatility in both domestic and international markets. As a result, exporters may face challenges in maintaining stable supply and meeting the premium pricing expectations for Thai Jasmine rice, while farmers must balance cost management with maintaining high quality to preserve their reputation in global markets.

❖ *Thai Jasmine rice Policy program*

After the problematic paddy pledging program ended in 2014, the new government aimed to clear the rice stockpiles within two to three years through transparent auctions. By September 2018, only 0.2 million tons remained in storage, as results, the rice export price began to increase in 2018 (FFTC-AP, 2019). The reason was that the Thai government held a large volume of rice stockpiles as liquid reserves, which discouraged traders from purchasing at higher prices. The new military government introduced a rice policy combining increase productivity and reduce the production cost by adopting large scale farm, flat-rate payments to farmers, pledging schemes to delay sales, subsidies for farmer organizations, and soft loans for millers to stock paddy (FFTC-AP, 2019). In 2023, Thai government introduced the paddy rice price guarantee program and other market supporting programs. Also providing direct payments and credit to the private sector to such as millers, traders, and corporations who agree to store paddy for a fixed period after harvest. By delaying sales, these stakeholders can potentially benefit from higher future prices, while the government helps offset some of the associated storage costs (USITC, 2025, 225). Additionally, the Thai government supports rice producers by subsidizing certain input costs, including rice seeds, fertilizers, and crop insurance. Support is also provided through cooperative partnerships, with direct payments made to producers.

In 2023, the policy also provided farmers with income support, to help farmers in both production costs and quality improvement initiatives. The level of support varied according to the amount of land allocated to rice cultivation. Another income support is the policies guarantee prices when domestic rice prices fall below. However, unlike the private stockholding incentives, these programs have been implemented irregularly or are not renewed annually (USITC, 2025).

Overall, Thai government interventions have provided important support for farmers and helped stabilize prices in the rice sector. However, the focus has been largely on income assistance and stock management. But the structural improvements to production efficiency of gains in yield and productivity remain limited. Investment in irrigation is also required in case of improving productivity which is a long-term challenge for sustaining its premium position in the global market.

❖ *Geographical Indications (GIs) for Jasmine rice in Thailand*

Geographical Indication is a label used for products that have a unique quality, reputation, or characteristics because they come from a specific location. The product's uniqueness is linked to natural factors (like soil, climate) or human factors (like traditional skills) in that area.

- *Hom Mali Thung Kula Rong-Hai*

Jasmine rice is also protected under Geographical Indications (GIs), with certain varieties registered in line with the Trade-Related Aspects of Intellectual Property Rights (TRIPS) Agreement of the World Trade Organization (WTO). Among these, the GI for *Thai Hom Mali Rice* from Thung Kula Rong-Hai holds the top position and is considered the most significant in Thailand (Lerdluksamee et al., 2024). In 2006, the rice was registered by the department of property rights ministry of commerce of Thailand, and, in 2010, it was registered under the EU's Protected Geographical Indication (PGI) scheme (FFTC-AP, 2017). It covers designated areas in the country's Northeastern region in five provinces: Roi Et, Mahasarakham, Surin, Yasothorn, and Sisaket. This region is renowned for its unique soil composition and climatic conditions, which give the rice its distinctive aroma, texture, and quality. A Geographical Indication (GI) is a designation used for products whose quality, characteristics, or reputation are closely linked to their geographical origin. It serves both to preserve the product's reputation and to protect it from unauthorized use by third parties (FFTC-AP, 2017).

The Geographical Indication (GI) for Jasmine rice from Thung Kula Rong-Hai have process from KDML105 and RD15 rice varieties, is not only safeguards its unique qualities and distinctiveness but also supports community development in the Thung Kula Rong-Hai plain. Recognition of its quality and the premium prices it commands contribute directly to local economic growth (FFTC-AP, 2017).

Figure 3.4 Thung Kula Rong-Hai plain in Thailand



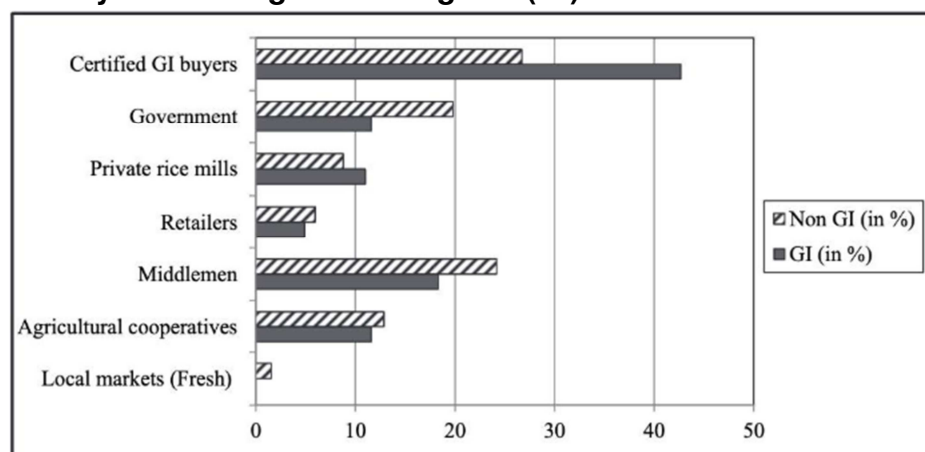
Source: FFTC-AP (2017)

According to the Food and Fertilizer Technology Center for the Asian and Pacific Region (FFTC-AP, 2017), although producers benefit significantly from the GI certification of Jasmine rice, adoption remains limited due to the high transportation costs involved in delivering rice to millers or buyers (FFTC-AP, 2017).

The GI rice markets for farm households remains limited, primarily due to the long distances required to transport GI rice to certified buyers, who are usually located in district centers (Ngokkuen et al., 2012 p.176). Consequently, farmers choose from various selling options. Some sell to GI buyers only when premium prices are offered. In Thung Kula Rong-Hai, approximately a bit more than 40 percent of Jasmine rice with GI status is sold to certified buyers. Other channels include sales to middlemen, cooperatives, or rice mills. Around more than 10 percent GI Jasmine rice is sold to the government under the rice price guarantee scheme, with farmers storing the rice at home until collection. Almost 20 percent is sold to the middleman, which is sold directly from the rice fields, where buyers come to pick it up (Ngokkuen, et al., 2012 p.176).

Private rice millers and agricultural cooperatives in the region account for over 10 percent of GI Jasmine rice sales by farmers. These buyers typically directly pick up the rice farmers' residences and often offer prices above the prevailing market rate (Ngokkuen et al., 2012, p. 176).

Figure 3.5 Rice buyer in Thung Kula Rong-Hai (GI) area



Source: Ngokkuen (2012)

- *Hom Mali Surin*

Another Thai Jasmine GI rice is grown from KDML105 or sometimes RD15, a variety but produced in Surin province, also in the northeastern region of Thailand (Lerdluksamee et al., 2024). It is one of the best-known Jasmine rice under the suitable condition of soil and weather that contribute to superior rice quality. It is also one of the provinces in Thung Kula Rong-Hai, but Surin Jasmine rice is tied in cultural heritage and identity as a rice province.

- *Hom Mali Phayao*

Thai GI Jasmine rice grown from KDML105 and sometimes RD15 varieties which are produced in Phayao province in the northern region in Thailand. The landscape and climate conditions are perfect to grow quality Jasmine rice. Locally, it is marketed under the brand name “*Hug Phayao*”, developed by C.P. Intertrade Co., Ltd. (Royal Umbrella brand) (Nasdaq, 2019).

Figure 3.6 Jasmine rice brand “Hug Phayao”



Source: Nasdaq (2019)

Table 3.8 Geographical Indications for Jasmine rice in Thailand

Rice Variety	Region	Province	GI Status	Distinctive Features
Khao Hom Mali Thung Kula Rong-Hai	Northeastern Thailand	Roi Et, Mahasarakham, Surin, Yasothon, Sisaket	GI Protected	The most famous Thai Jasmine rice, known for its unique traditional cultivation methods.
Khao Hom Surin	Northeastern Thailand	Surin	GI Protected	Fragrant jasmine rice, grown in the specific soil and climate of Surin.
Khao Hom Payao	Northern Thailand	Phayao	GI Protected	Distinctive fragrance and taste, grown in warm climate conditions.

Source: Compiled by the author

Overall, Thailand has established policies to safeguard Jasmine rice producers. The implementation of Geographical Indications serves to enhance the quality and reputation of Thai Jasmine rice while preserving cultural heritage. Furthermore, these measures assist farmers in maintaining rigorous production standards and contribute to the economic development of local communities.

❖ *Jasmine rice price trend and exchange rate*

Thai Jasmine rice (Khao Hom Mali) is one of the most valuable agricultural products. Its rice also gives the most value when sold or exported. However, the price of rice has considerably fluctuated, influenced by multiple factors. These include domestic production conditions such as weather, soil fertility, and harvest yields, as well as external market dynamics like global demand, international competition, and trade policies.

According to the Food and Agriculture Organization of the United Nations (FAO, 2025b) (table 3.9), Type of rice Thai Fragrant refers to Hom Mali rice grade A (Jasmine rice). It is the highest price compared to all categories of all Thai rice. As mentioned in previous chapter (2), during 2019/2020 due to the impact of drought the rice price increased in 2020. Subsequently, rice prices showed a gradual increase between 2021 and 2024 (FAO, 2025b).

Table 3.9 Thai rice price from 2020 - 2024 (USD/Metric ton)

Type of rice	2020	2021	2022	2023	2024
Thai 100% B White	514.6	475.7	450.7	567.3	603.8
Thai 25%	482.9	449.6	429.1	532.1	559.9
Thai A1 Super (White broken rice)	431.0	415.4	405.4	462.2	460.7
Thai Fragrant (Hom Mali grade A)	1,050.6	792.8	879.6	891.0	960.8
Thai Glutinous 10%	1,064.0	686.2	672.3	808.7	823.3
Thai Parboiled 100%	512.3	470.2	450.7	558.6	594.2

Source: FAO (2025b)

Recently, the average price of Hom Mali rice from January to July 2025 was approximately 1,042.80 dollars per ton (FAO, 2025b). Which represents increasing global demand and the contributing rise in premium Jasmine rice price.

Thai rice prices are also influenced by fluctuations in the Thai baht exchange rate. Price volatility can be attributed to the inelastic nature of consumer demand, where relatively small changes in available supply (in quantity) of rice lead to significant changes in price (USITC, 2025, p.60). Therefore, the exchange rate is also another factor that can be a risk effect to Thai Jasmine rice because profits depend on converting from US dollars into Thai baht, and currency fluctuations can directly impact competitiveness, price stability, and farmers' earnings.

3.5 The impact of global dynamic on Jasmine rice exporters and farmers

As per all the data shown above, the Thai Jasmine rice industry continues to face multiple challenges in the global market. With increasing global dynamics and the rapid development of new technologies, both opportunities and pressures are placed on farmers, producers, and traders. Farmers, in particular, struggle with high production costs, such as fertilizers, labor, and other expenses of Jasmine rice cultivation. Additionally, the added transportation costs such as the Geographical Indication (GI) in Thung Kula Rong-Hai rice area, which have long distances. Although government policies aim to support income and promote the Thai Jasmine for farmers, these measures remain limited in scope. Furthermore, unpredictable rainfall directly affects Jasmine rice cultivation, especially in the Northeastern region, where irrigation systems are underdeveloped. Given these circumstances, strengthening support for farmers and producers becomes a crucial factor for sustaining industry. The unpredictable demand for Jasmine rice represents another factor which is also impacting Thai rice farmers.

The global market dynamics also affect Thai Jasmine rice export, including those who operate as intermediaries in the supply chain. They are facing challenges, including high logistics costs which is a non-farm expense, fluctuations in exchange rates, and the need to comply with the trade policies. In addition, demand for Thai Jasmine rice depends heavily on consumer preferences and their willingness to pay a premium price. Since the global market offers many alternative fragrant rice varieties from competing countries, Thai Jasmine rice exporters must also compete with increasing competition.

❖ *The impact on Farmers*

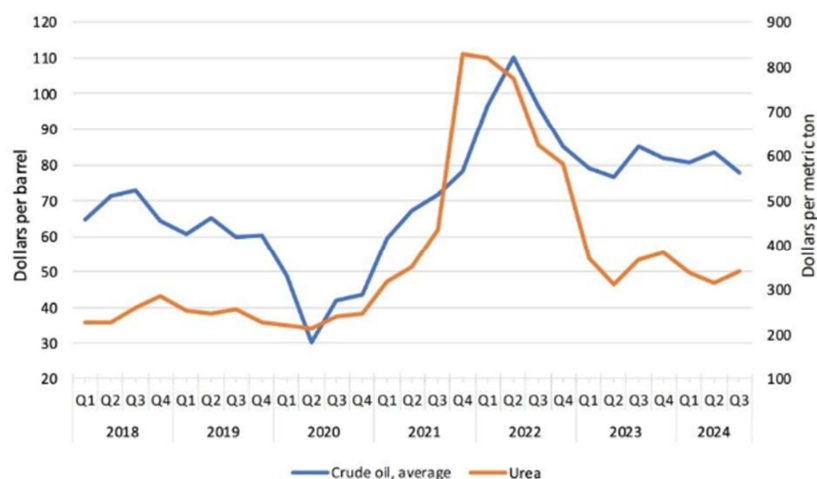
- *Various cost of rice production on farmers*

Thai Jasmine rice farmers face various input costs, including seeds, pesticides, machinery, fuel, fertilizers, water, and labor. In addition, some farmers also have extra expenses such as land rent for rice cultivation. The cost of rice production in Thailand depends on the variety of rice, for aromatic Jasmine rice variety having lower yield than the variety of long grain white rice (USITC, 2025, p.71).

According to data from the United States International Trade Commission (USITC, 2025), rice production costs are influenced by yield. This means higher yields help distribute fixed expenses more efficiently across total output. (USITC, 2025). One of the major challenges Thai farmers faces is that cost of rice production keeps high, but productivity remains relatively low. Additionally, the cost of rice cultivation is projected to rise from 9,831 baht per ton per year in 2021, to between 10,500 and 11,000 baht per ton per year in 2024 (Srisopa, et al., 2023, p.2).

Thai Jasmine rice farmers also face significant the costs of fertilizers and energy inputs have risen sharply following two major global events: the COVID-19 pandemic and the Russian invasion of Ukraine. These disruptions have significantly increased rice production costs across all major producing countries, including Thailand, while also driving up transportation expenses. Collectively, these factors have contributed to higher international rice prices. Thailand fertilizers cost 30 percent of the total cost of production (USITC, 2025).

Figure 3.7 Prices of crude oil and urea from 2018-2024



Source: USITC (2025)

- *Low productivity and increasing competitions*

Thai Jasmine rice productivity is considerably lower compared to other countries. For instance, the average yield of Thai Jasmine rice variety of (KDML 105) in 2023 was about 2,331 kilograms per hectare (OAE, 2025a), whereas Basmati-370, another aromatic rice variety, produces approximately 2,557 kilograms per hectare (Singh et al.,2021, p.426). For rice varieties other than jasmine rice, the average yield in Thailand is around 400-500 kilograms per rai (0.16 hectare) therefore, 1 hectare have approximately 2,500–3,125 kilograms of rice yield, whereas Vietnam achieves about 1,000 kilograms per rai or about 6,250 kilograms of rice yield per hectare and China approximately 1,000–1,200 kilograms per rai or 6,250-7,500 kilograms of rice yield per hectare (The nation, 2024). This indicates that farmers also face challenges from rice producers in other countries, creating stronger international competition. Meanwhile, enhancing productivity remains a critical area for the development of rice production in Thailand.

- *Limit of adoption in advanced technology*

Additionally, the adoption of advanced technologies, such as irrigation systems and modern machinery, has also contributed to improved rice productivity. For instance, according to data from Food and Fertilizer Technology Center for the Asian and Pacific Region (FFTC-AC)(2020) the average yield of Hom Mali (jasmine) rice in the Northeast was about 2,225 kilograms per hectare, while irrigated areas in the Central region achieve higher averages of approximately 2,300 to 3,113 kilograms per hectare. This yield variation has a direct impact on the income of jasmine rice farmers (FFTC-AC, 2020). In recent years, climate conditions have become increasingly unpredictable. Severe droughts in 2015 and 2019 directly affected Thai Jasmine rice producers, as most jasmine rice cultivation depends heavily on rainfall. Consequently, climate change such as droughts and limited irrigation in certain areas has had a significant impact on the productivity and livelihoods of Thai rice farmers

- *Exchange rate fluctuation*

Thai Jasmine rice farmers are largely paid in Thai baht, even though exports are traded in foreign currency in USD. Fluctuations in exchange rates can affect farm-gate prices indirectly: a stronger baht may reduce export demand and push local prices down, while a weaker baht can make Thai rice more competitive internationally. However, farmers often do not capture the full benefit of favorable exchange rates because most transactions are handled by intermediaries.

Table 3.10 Thai Hom Mali rice sold per ton at rice farm gate from 2015-2024

Year	Average rice sold (Thai Baht)	Average rice sold (US dollar)
2015	11,632	360.35
2016	8,896	275.59
2017	11,879	368.00
2018	15,342	475.28
2019	13,865	429.52
2020	10,623	329.09
2021	10,040	311.03
2022	13,409	415.40
2023	13,624	422.06
2024	14,881	461.00

Note: Conversion rate used 1 USD = 32.28 Thai Baht.

Source: OAE (2025c)

❖ *The impact on Exporter*

Global dynamics also significantly affect exporters and traders of Jasmine rice. Non-farm costs, such as international shipping and logistics, are integral parts of the supply chain and contribute to higher final prices for consumers abroad. Exchange rate fluctuations directly influence traders' revenues, while global competition, particularly from alternative rice varieties offered at lower prices, further pressures their margins. In addition, traders must comply with the import policies and regulatory requirements of destination countries, which adds another layer of complexity to international trade.

- *Post-farming cost*

Post-farming costs, also referred to as non-farming costs, include expenses such as transportation or shipping, storage, and packaging. An efficient international transportation network is essential for delivering high-quality rice to consumers; inefficiencies in this system are likely to increase the cost of milled rice (USITC, 2025). Conversely, efficient logistics enhance export competitiveness. Despite global logistical challenges between 2018 and 2023, Thailand ranked third in this area, following China and the United States (USITC, 2025).

Figure 3.8 Logistics Performance Index for rice producing countries, 2023

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: USITC (2025)

Between 2018 and 2023, Thai Jasmine rice exporters were impacted by rising global shipping costs caused by major disruptions in international trade. The global events including COVID-19 pandemic and the Russia-conflict led to volatile shipping conditions, with freight rates surging sharply in 2021 and 2022 (USITC, 2025).

- *Global competition*

Thai Jasmine rice is a key product differentiator and a major source of competitiveness for Thailand's rice industry, as it is globally recognized for its premium quality. However, alternative aromatic rice varieties also compete in the market. India's Basmati, another high-quality fragrant rice, appeals to international consumers, while Vietnam produces Jasmine rice at lower prices. For price-sensitive buyers, these alternatives, particularly Vietnamese fragrant rice, present attractive substitutes to Thai Jasmine rice.

- *Trade policy*

International trade policies and regulation are also one of the factors that significantly shape opportunities and challenges for Jasmine rice exporters. For example, in 2023, the United States was the largest destination for Thai Jasmine rice, accounting for 41 percent of total exports (Sowcharoensuk, 2024b). Effective August 1, 2025, the U.S. imposed a 19 percent tariff on Thai rice, including Jasmine rice, which is lower than the previously threatened 36 percent (The nations, 2025). This immediate adjustment has a significant impact on Thai rice exports. The reduction was welcomed by Thai officials, as it helps maintain the competitiveness of Thai Jasmine rice in the U.S. market, a key destination for Thailand's rice exports.

Thai Jasmine rice sector must also comply with the regulations of its export destinations. For example, exports to Europe are subject to specific trade policies and rules designed to ensure food safety, quality, and fair competition. Within the EU, Japonica rice varieties dominate local production, while long-grain (Indica) rice,

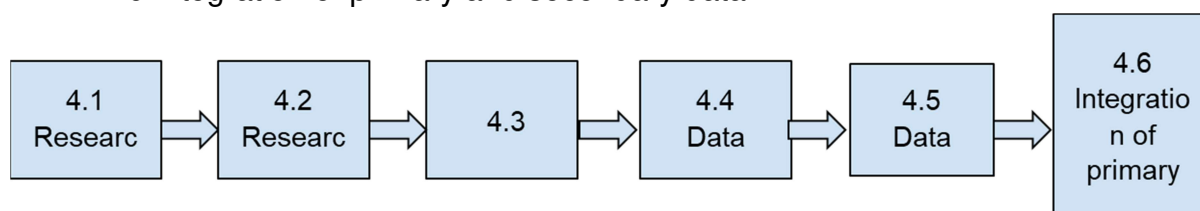
such as Thai Jasmine rice, is preferred by consumers in most countries. Therefore, exporters of long-grain aromatic Jasmine rice from Thailand must meet strict compliance requirements, including food safety standards and certification, to access the European market.

Thai exporters of white rice, white fragrant rice (such as Jasmine rice), and parboiled rice under subheading code of 1006.30 of the Customs Tariff can benefit from a preferential trade agreement with the European Union, which allows them to be exempted from EU import taxes. To qualify for this tax exemption, exporters must obtain an export certificate which supports the application for an EU import license. However, even with the tax benefit, a surcharge of 1,500 baht per ton is imposed when using this certificate. This surcharge serves as an administrative fee and ensures compliance with both Thai and EU regulations. While it adds a cost for exporters, the system allows Thai rice to maintain preferential access to the EU market (Ministry of Commerce, 2021).

Chapter 4: Methodology

This thesis examines the dynamics of the global market for Thai Jasmine rice, focusing on production, exports, and the experiences of farmers in northeast Thailand in 2025, with the aim to identify key challenges faced in Jasmine rice production by farmers. The study adopts a quantitative research approach, utilizing primary data collected through questionnaires administered to farmers in northeastern Thailand. In the questionnaires, the author developed questions specifically for this study, following on guidelines from (Suwannaporn et al., 2008, p.37, Madhyamapurush et al., 2021), to identify the key challenges of rice production in this study. Furthermore, adapting several questions from past studies better illustrated the unique context surrounding Thai Jasmine rice production. Secondary data were also gathered from official sources, including international reports and statistics on global rice export trends which provided a broader market perspective, tariffs for import and export which enabled the study to connect farmer-level challenges with national and global export trends. This chapter is conducted as following:

- 4.1 Research Design
- 4.2 Research Objective
- 4.3 Research Tools
- 4.4 Data Collection
- 4.5 Data Analysis
- 4.6 Integration of primary and secondary data



4.1 Research Design

The study adopts a quantitative and non-experimental research design to investigate how shifting global market conditions influence Thai Jasmine rice production, export and farmers. The research design does not manipulate or experimentally control variables but instead collects data directly from farmers through a structured survey, alongside secondary data from official sources.

This study relies on two types of data:

1. *Primary data* based on (questionnaire) designed by authors, collected from 100 Thai rice farmers in the Northeast of Thailand, specifically in Khon Kean and Udon Thani provinces. The provinces were selected because they are both located in a key rice growing region and the author also has connections with local farming communities, which could facilitate trust and enable effective data collection.

2. *Secondary data* from official data (statistical and international sources) for analyzing the Thai Jasmine rice export trend in the global market.

This approach enables the study to combine farmer-level evidence with market-level data, providing comprehensive understanding of the factors influencing Thai Jasmine rice production and its exports.

4.2 Research Objective

This research aims to:

- Identify the factors that are challenging Thai Jasmine rice farmers in the context of global market dynamics.
- Analyze the relationship between production costs, structural factors such as irrigation, and policy support, and examine how these elements ultimately affect farmers' outcomes.
- Explore the trend of Jasmine rice export and evaluate the drivers that shape Jasmine rice export success. Understanding how global fluctuation affects both Thai Jasmine rice farmers and exporters.

4.3 Research Tool

The research uses two main tools for data collection. The first was an electronic questionnaire, which was used first in the capture process aimed at gathering the farmers' actual experiences and regarding farming. The second consisted of secondary data, obtained from official sources, including national and international databases, government reports, and trade organizations.

- Tool 1 → questionnaire (survey) for through google form.
- Tool 2 → Secondary data from official sources.

The survey collected from a sample of 100 farmers by using sampling based on farmers involved in Jasmine rice cultivation in Khon Kaen and Udon Thani provinces. Participants in this survey were identified through a combination of the author's connections with local farming communities and the people in the surrounding area who are involved in Jasmine rice production. The survey composed with 27 questions covering 5 sections:

1. Demographic Information: including age, gender, education level and farming experience. The questionnaire consisted of 4 closed-ended questions, each requiring respondents to select a single answer.
2. The production practice: focusing on rice cultivation over the past 3-5 years includes the land use, cropping patterns (main and second season), the cost of production and the key challenging factors faced by farmers. This section included 4 closed-ended questions, along with 1 multiple response question that allowed respondents to select all applicable key factors challenging farmers.

3. The market and the selling practice: consisting of the selling term (paddy or milled rice) of Jasmine rice by farmers, the storage decision, main selling channel and the major market challenges they encounter. This part consists of 6 closed-ended questions and a question multiple response to select the key challenges in the rice market factors.
4. Perception of rice on the global market dynamic: measured through a Likert-scale questionnaire composed with 7 questions, covering factors such as international demand on Jasmine rice, global price fluctuation, policy support, international competition and the weather condition impact on rice production. The rating scale measured in this section are:
 - 1 = Strongly Disagree
 - 2 = Disagree
 - 3 = Neutral
 - 4 = Agree
 - 5 = Strongly Agree
5. Recent years context (2021-2024): covering of rice yield in, the major cost for production and farmers' satisfaction with the rice prices received in 2024. The questionnaire consisted of 4 closed-ended questions and multiple response questions.

4.4 Data collection

- Primary Data (Thai Jasmine rice farmers)

Primary data were obtained through an online questionnaire (google form) which was collected from Jasmine rice farmers in Khon Kaen and Udon Thani provinces, both located in Northeast of Thailand. A total of 100 random farmers participated in the survey in July-August 2025. The survey was designed to gather information on production practices, input costs, challenges in cultivation, market access, and perceptions of competitiveness in the global rice market. Questions consist of closed-ended questions and likert-scale questions which ask more general questions such as rate on a scale of five. The survey, which is a primary data methodology, was intended to gather in-depth individual perception analyses of the farmers on the jasmine rice competitiveness and the cultivation practices.

The primary data collection: although the questionnaire centered on factors affecting Jasmine rice farmers, data on the cultivated area was not collected. As a result, it was not possible to calculate yield per unit area accuracy. This information is considered when analyzing the production cost per unit and rice yield outcome. Therefore, the comparison of average production outcome comparison with other competitors such as Vietnam is based on secondary data sources.

- Secondary Data (Exporters)

The secondary data are collected from official and international sources to complement the survey findings. These included export statistics of Jasmine rice from the Thai Rice Exporters Association, the Ministry of Commerce, reports from the Food and Agriculture Organization (FAO), The U.S. Department of Agriculture (USDA) and the others official trade data from international organizations.

- The secondary data supplements the primary survey, providing insights into global demand, prices, and competition for Thai Jasmine rice.

4.5 Data analysis

After gathering all responses from the questionnaire (primary data), all information and data were aggregated, organized, and interpreted, using techniques from the primary statistical methods as follows:

- Descriptive statistics: the primary data used to analysis the data by:
 - ❖ Using percentage (%) and frequency values for variables with grouped measurement levels, including personal factors such as gender, age, education level, and work experience and key challenges in production and market practices related to Jasmine rice production.
 - ❖ Using mean value was used to summarize respondents' answers of the likert-scale questions in the section of perception of rice on the global market dynamic.
- Trend comparison: this secondary data was used to analyze patterns, Jasmine rice export, policy support and price fluctuation, including changes in export volumes and values over the last 3-5 years. Additionally, comparisons of rice yield outputs with a competitor and the prices of alternative rice varieties were conducted to provide a better understanding of one of the factors influencing global competition.

4.6 Integration of primary and secondary data

The study integrates primary data, collected through questionnaires from farmers with secondary data from official reports, trade statistics, and published studies. While primary data provided insights into farmers' personal experiences, secondary data link farm level challenges with market level outcomes, allowing a more complete understanding and complement of how global dynamics affect both the production and export aspects of the Jasmine rice supply chain. This integration also enables the analysis of relationships between farmers' production and the performance of Thai Jasmine rice in international markets.

Chapter 5: Results and findings

The results of this study are organized into two parts: the first presents the findings derived from the questionnaire or survey (primary data) from 100 farmers in the northeast, specifically Khon Kean and Udon Thani. The questionnaire consists of 5 sections including demographic information, production practice, market and selling practice, perceptions on global market dynamics and the context of the last 3 years. The secondary data incorporates trends and secondary information that support and contextualize the primary findings.

5.1 Finding from primary data

- *Results of demographic Information section data (Section A)*

The analysis of demographic information of 100 Jasmine rice farmers includes age, gender, education level, and years of experience in rice farming, presented in terms of percentages and frequencies, as shown in Table 5.1.

Table 5.1 Frequency and percentage distribution of demographic characteristics of 100 Jasmine rice farmers

Demographic Information	Farmers (person) Frequency (f)	Percentage (%)
1. Age (years old)		
Less than 35	16	16
35-45	4	4
46-55	10	10
56-64	37	37
More than 65	33	33
Total	100	100
2. Gender		
Male	42	42
Female	45	45
Prefer not to say	13	13
Total	100	100
3. Education Level		
No formal education	8	8
Primary school	38	38
Secondary school	34	34
Higher education (college/university)	20	20
Total	100	100
4. Years of Experience (year)		
Less than 5 years	12	12
5-10	10	10
11-15	18	18
16-20	25	25
More than 20	35	35
Total	100	100

As the table shows above, many of the 100 Jasmine rice farmers in Udon Thani and Khon Kaen provinces were aged 56-64 years which accounted for 37 percent, followed by those who were over 65 years or 33 percent. The younger farmers represented a smaller share, with 16 percent under 35 years of age, 4 percent aged 35-45 years, and 10 percent aged 46-55 years. This highlights an aging farming population, suggesting it is one of the challenges for the long-term sustainability of Jasmine rice cultivation as younger generations show a small number participation in rice farming.

In terms of gender, 45 percent of respondents who were involved in Jasmine rice production were female, while 42 percent were male. A small share, preferred to not say accounted for 13 percent. This represents the balance between male and female in this study area is not dominated by one gender. Which indicates participation of women in the rice production alongside with men farmers.

The education level of Jasmine rice farmers, the majority of total, had completed primary school which accounted for 38 percent, followed by secondary school with 34 percent. The smaller proportion obtained higher education, or which is higher than high school is 20 percent while only 8 percent reported no formal school which is 8 percent.

In terms of years of experience in rice farming, the highest proportion of farmers in the area, more than 20 years of experience, represented 35 percent of the total sample. Followed by 25 percent for 16-20 years. Those with 11-15 years accounted for 18 percent, while farmers with 5-10 years and less than 5 years represented 10 percent and 12 percent, respectively.

- *Results of production practice section (Section B)*

The analysis of production practice composed of the land where Jasmine rice grows by owned or rented, the average of Jasmine rice harvested per year, the Jasmine rice type farming (Na Pee, Na Prang or both) the changed over past 3-5 year of cost of production and the biggest challenges in Jasmine rice production for among 100 rice farmers in the study area.

Following results data presented in table 5.2, show that most Thai Jasmine rice farmers in Udon Thani and Khon Kean province cultivate rice on their owned land which accounted for 55 percent. Meanwhile 41 percent are using both land rent and own for producing Jasmine rice. In contrast, only 4 percent is renting land for rice cultivation which accounted for the smallest share of the total rice farmers in this survey.

In terms of annual Jasmine rice harvest, the result indicated that almost half of farmers harvest Jasmine rice at once harvest per year, reporting 49 percent, typically during the rainy season. While 22 percent is 2 harvests a year, which covers both during the main-season and the second season. And a small proportion of the sample is more than 2 harvests a year, representing 22 percent.

Table 5.2 Frequency and percentage of production practice in Jasmine rice cultivation.

Production practice	Farmers (person) Frequency (f)	Percentage (%)
5. The land grow		
Owned	55	55
Rented/Leased	4	4
Both (owned and rented)	41	41
Total	100	100
6. Jasmine rice harvested a year		
One harvest	49	49
Two harvest	29	29
More than 2 harvests	22	22
Total	100	100
7. Type of Jasmine rice farming		
Na Pee (Wet-season)	52	52
Na Prang (Off-season)	6	6
Both types	42	42
Total	100	100
8. The change of cost of production over 3-5 years		
Increased	71	71
Remained the same	15	15
Decreased	14	14
Total	100	100

To support more information about harvesting Jasmine rice cultivation in this sample study. The table above shows 52 percent of total in this sample farming in the wet-season, both farming during wet-season and off-season represented 42 percent. While Na Prang cultivation shows proportion of only 6 percent of the total sample in this study.

Another aspect in production practices examined in this section is the change of cost of the Jasmine rice production during the past 3-5 years, the results show that 71 percent of the respondents reported an increased in rice production cost, 15 percent

of the respondents indicated the cost remained the same, and only 14 of total of respondents reported the decreased in change of cost of rice production during this years.

Following table 5.3, the respondents in this study were allowed to select more than 1 applicable answer. The results indicated that the most common challenge in rice production is high input cost, 81 percent of farmers. The closely followed water shortage and drought reported 80 percent, then pests and diseases accounted for 75 percent. Additionally, 38 percent of farmers identified limited labor as a challenge, while 15 percent reported limited access to technology such as machinery.

Table 5.3 The major challenge in rice production among 100 farmers.

The major challenge in rice production	Farmers (person) Frequency (f)	Percentage (%)
High input costs	81	81
Water shortage/drought	80	80
Pests and diseases	75	75
Limited labor	38	38
Access to technology (machinery)	15	15
Others	1	1

Note: Respondents could select more than one challenge; percentages may exceed 100%

- *Result of marketing and selling practice (Section C)*

This section examines the marketing and selling practices of farmers in this study. The questionnaire including of how farmers selling rice in term of paddy rice or milled rice, whether Jasmine rice is sold immediately after harvest, the reason if farmers storing rice, who is the main markets to which farmers sell, key challenges faced in rice market, price trends over the past 3 years and farmers' perceptions regarding the international export of their rice. This part of the survey provides insights into how the rice is marketed and sold after harvest based on farmers' experience.

According to the result in the table below, most farmers sell their rice as paddy rice, accounting for 82.83 percent, while only 17.17 percent sell rice as milled rice. This study also examined whether farmers sell their rice immediately after harvest. The results show that half of the 100 farmers sometimes sell their rice immediately, while 36 percent often do so. A smaller proportion of farmers rarely sell immediately 11 percent, and only 3 percent never sell their rice right after harvest.

Table 5.4 Frequency and Percentage of Farmers' Market and Selling Practices.

Market and selling practice	Farmers (person) Frequency (f)	Percentage (%)
10. Rice sold in term of		
Paddy rice	82	82.83
Milled rice	17	17.17
Non answer*	1	-
Total	99	100
11. Rice is sold immediately after harvest		
Yes, often	36	36
Yes, sometimes	50	50
rarely	11	11
Never	3	3
Total	100	100
12. Reason if store rice before selling		
Waiting for better price	62	63.92
Lack of immediate buyers	14	14.43
Limit of storage	20	20.62
Others	1	1.03
Non answer*	3	-
Total	97	100
13. The main market who which farmers sell		
Local traders	9	9
Private rice millers	54	54
Cooperatives	29	29
Export companies	2	2
Retailers	1	1
Government	0	0
Middlemen	5	5
Total	100	100

*Note: *out of 100 respondents, there are some who did not answer the questionnaire. Therefore, the percentage calculated is based on the total valid responses.*

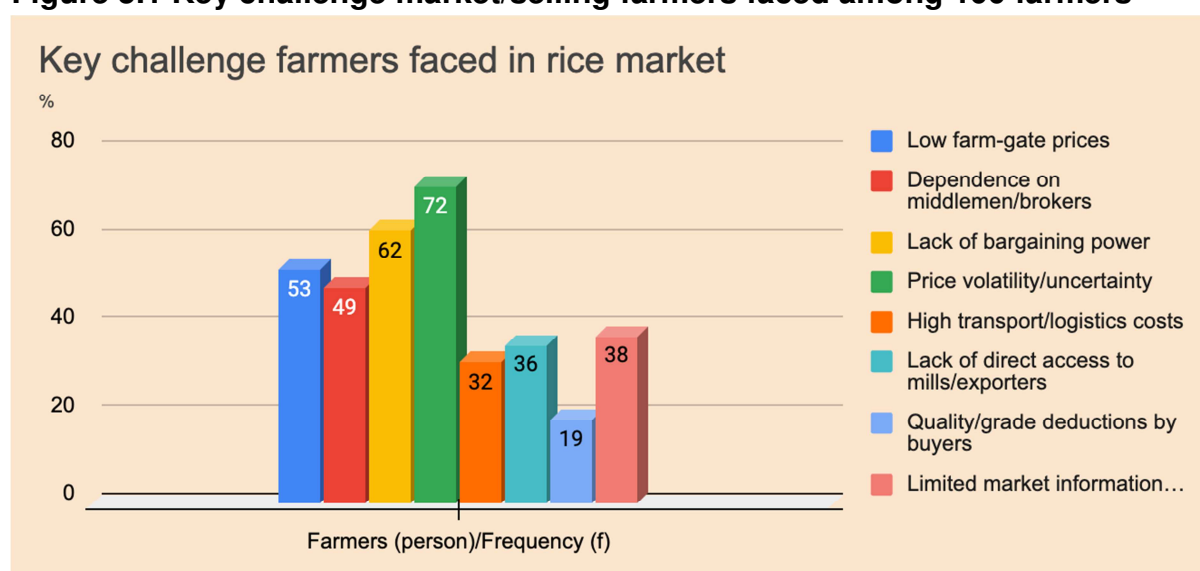
Regarding the question of if they store rice before selling, the majority of farmers, about 63.92 percent, reported that they do so to wait for better or higher prices. However, the results also reveal constraints that limit the ability to store rice: 20.62 percent of farmers cited limited storage capacity, while 14.43 percent mentioned the lack of an immediate buyer as influencing their selling decisions.

More than half of 100 respondents with 54 percent, reported selling their rice primarily to private rice miller, making it the most common market channel in this study area. This was followed by cooperatives, chosen by 29 percent. A small

proportion sold to local traders 9 percent, middlemen 5 percent, export companies 2 percent and retailers accounted for 1 percent.

According to findings, figure 5.1, shows that price volatility was the most reported challenge, cited by 72 percent of a total of 100 farmers, followed by lack of bargaining power 62 percent. These issues highlight the difficulties farmers face in securing stable and fair market prices for their rice. Low farm-gate prices were reported by 53 percent of farmers as a major challenge, reflecting one of the limited profitability for farmers. Dependence on middlemen, accounted for by 49 percent, further constrains farmers' ability to negotiate prices in the market. Limited market information 38 percent restricts farmers from making informed selling decisions, while the lack of direct exporters is 36 percent narrows opportunities to access higher value in the markets. High transportation costs, 32 percent reduce overall earnings and quality or grade deductions imposed by buyers for 19 percent in the key challenge farmers faced when selling the rice.

Figure 5.1 Key challenge market/selling farmers faced among 100 farmers



Note: Respondents could select more than one challenge; percentages may exceed 100%

Regarding farmers' perceptions of rice price trends during the past 3 years, 49.5 percent reported that the price had decreased, while 46.5 percent indicated that the price had remained the same. Only 4 percent of respondents felt that Jasmine rice prices had increased during this period. These findings reflect farmers' concerns about the declining farm-gate prices, which may be influenced by global market competition, fluctuating demand, and domestic pricing policies.

Observing the farmers' perception of their awareness of whether their rice is exported internationally, 43.4 percent of total respondents knew that the rice was exported, while 39.4 percent didn't know and 17.2 percent were not sure if their rice was exported. This aspect suggests that limited awareness suggests that many

farmers have minimal direct contact with export markets, which may affect their ability to make informed decisions about pricing, quality standards, and production strategies to meet international demand.

- *Results of farmers' perception on global market dynamic (section D)*

This section examines farmers' perceptions regarding their understanding of the global rice market context. It covers several aspects, including international demand affects rice prices, the direct impact of global rice prices on farmers' incomes, the role of government policies in addressing price fluctuations, the potential for export opportunities to improve income, competition from other rice-exporting countries, the effects of weather conditions on Jasmine rice production, and the influence of conflicts between Thailand and Cambodia on rice production in the study area.

According to table 5.5, the farmers in the study area perceived that international demand for Jasmine rice affects rice prices, with an average score of 4.23 out of 5. This high mean value indicates that most respondents believe fluctuations in global demand directly influence the price they receive at the farm level. Highlight farmers' awareness of their dependence on international markets, suggesting that shifts in global consumption trends or import policies can significantly impact their household income.

Table 5.5 Farmers' perception of international demand affects rice prices.

Rating	Frequency (f)	Percentage (%)
17. Perception of international demand affects rice prices		
5 - Strongly Agree	51	51
4 - Agree	26	26
3 - Neutral	19	19
2 - Disagree	3	3
1 - Strongly Disagree	1	1
Total	100	100
The mean	4.23	

Regarding the findings presented in Table 5.6, farmers' perception of the impact of global rice prices on their income received an average score of 4.28 out of 5. This high mean value indicates that most respondents strongly believe the global Jasmine rice price directly affects their income. Suggest that farmers are highly sensitive to changes in the global rice market, as variations in export prices can determine their income and profitability.

Table 5.6 Farmers' perception of global rice price impact on farmers' income.

Rating	Frequency (f)	Percentage (%)
18. Global rice prices directly impact on farmers' income		
5 - Strongly Agree	52	52
4 - Agree	29	29
3 - Neutral	14	14
2 - Disagree	5	5
1 - Strongly Disagree	0	0
Total	100	100
The mean	4.28	

As shown in Table 5.7, farmers have confidence in the role of government policies to address Jasmine rice price fluctuations, with the mean score of 4.13 out of 5. Indicates that most respondents have strongly believed government support can help stabilize market conditions.

Table 5.7 Farmers' perception in government policies in addressing price fluctuation.

Rating	Frequency (f)	Percentage (%)
19. Government policies could help market price fluctuations		
5 - Strongly Agree	47	47
4 - Agree	32	32
3 - Neutral	10	10
2 - Disagree	9	9
1 - Strongly Disagree	2	2
Total	100	100
The mean	4.13	

Following the table 5.8, the perception of Jasmine rice farmers in exporting Jasmine rice could create better income have strongly positive beliefs among 100 farmers in this study, with the average score 4.39 out of 5. Suggest that most respondents believe access to export markets provides them a higher return compared to selling domestically.

Table 5.8 The perception of export opportunities creates better income for Jasmine rice farmers.

Rating	Frequency (f)	Percentage (%)
20. Export opportunities creates better income		
5 - Strongly Agree	54	54
4 - Agree	36	36
3 - Neutral	6	6
2 - Disagree	3	3
1 - Strongly Disagree	1	1
Total	100	100
The mean	4.39	

Regarding farmers' perception of competition from other rice-exporting countries (e.g., Vietnam, India, Cambodia) affects the market for Thai Jasmine rice has the average mean value of 4.45 out of 5. Suggest that most of the respondents strongly believe these competing exporters significantly influence the market for Thai Jasmine rice, potentially affecting both pricing and demand for Jasmine rice.

Table 5.9 Farmers' perception of competition from other countries affects the market for Thai Jasmine rice.

Rating	Frequency (f)	Percentage (%)
21. Perception of competition from other countries affects the market for Thai Jasmine rice.		
5 - Strongly Agree	57	57
4 - Agree	32	32
3 - Neutral	10	10
2 - Disagree	1	1
1 - Strongly Disagree	0	0
Total	100	100
The mean	4.45	

As shown in Table 5.10, farmers' perceptions of the impact of weather conditions on Jasmine rice production received the highest mean score, averaging 4.69 out of 5. Resulting that the majority of respondents strongly believe extreme weather has a significant effect on Jasmine rice production, both in the present and in the future.

Table 5.10 Farmers' perception of extreme weather events affect Jasmine rice production in the future

Rating	Frequency (f)	Percentage (%)
22. Perception of extreme weather events affect Jasmine rice production		
5 - Strongly Agree	78	78
4 - Agree	16	16
3 - Neutral	4	4
2 - Disagree	1	1
1 - Strongly Disagree	1	1
Total	100	100
The mean	4.69	

In the final part of this section, farmers were asked about their perceptions that issues between Thailand and Cambodia do affect their Jasmine rice production in 2025. The results show a mean score of 2.65 out of 5, resulting in moderate low impact. Suggesting that respondents are in the area province where it is not close to the conflict area, hence, do not consider it a major factor influencing their rice production.

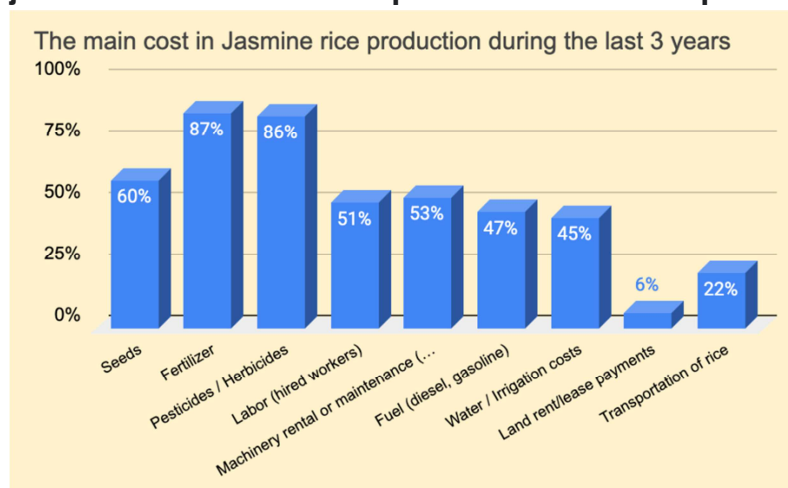
Table 5.11 Farmers' perception of issues between Thailand and Cambodia affect Jasmine rice production in 2025

Rating	Frequency (f)	Percentage (%)
23. Perception of issues between Thailand and Cambodia affect Jasmine rice production in 2025		
5 - Strongly Agree	20	20
4 - Agree	8	8
3 - Neutral	11	11
2 - Disagree	39	39
1 - Strongly Disagree	22	22
Total	100	100
The mean	2.65	

- *Results of the context of the last 3 years*

In 2024, 36.4 percent of farmers in this study harvested approximately 11-20 tons of rice, while 21.2 percent reported a harvest of less than 10 tons. Additionally, 18.2 percent of respondents harvested around 31-40 tons, and 17.2 percent produced approximately 21-30 tons. Only 6.1 percent of farmers had a harvest of 41-50 tons, and 1 percent reported more than 50 tons.

Figure 5.2 Major costs in Jasmine rice production over the past 3 years

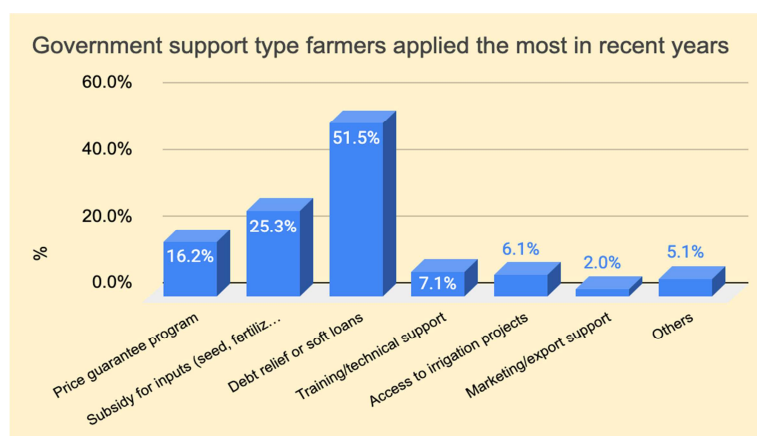


Note: Respondents could select more than one challenge; percentages may exceed 100%

According to the data presented in figure 5.2, among 100 respondents, the main cost of Jasmine rice production during the last 3 years was fertilizer, reported by 87 percent of farmers. Pesticides and herbicides followed closely at 86 percent. Other significant costs included seeds 60 percent, machinery rental or maintenance 53 percent, hired labor for harvesting 51 percent, and water cost 45 percent. Transportation accounted for 22 percent of respondents' production costs, while land rent was the least reported cost at 6 percent.

Regarding government policy programs utilized by respondents, 51.5percent reported benefiting from debt relief or soft loans. Subsidies for inputs such as fertilizers or seeds were used by 25.3 percent of farmers, while 16.2 percent participated in price guarantee programs. Training and technical support reached 7.1 percent of respondents, access to irrigation projects 6.1 percent, and other minor marketing support programs were reported by 2 percent.

Figure 5.3 Type of government support has helped you the most in recent years.



Note: Respondents could select more than one challenge; percentages may exceed 100%

Lastly, regarding satisfaction with the rice prices received in 2024, the majority of respondents with 67 percent reported being neutral. Meanwhile, 19 percent were dissatisfied, 13 percent very dissatisfied, and only 1 percent expressed satisfaction. Suggest that most farmers felt that received prices were neither favorable nor entirely unacceptable. This indicates a potential need for measures such as price stabilization programs, or stronger bargaining mechanisms to improve farmers' satisfaction with the prices they receive.

5.2 Finding of Secondary data (comparison trends)

This study applied secondary data, including official statistics and trade and value trends, to compare and support the findings obtained from the primary data and questionnaire responses. Additionally, these secondary data provide further insight into market dynamics and production trends to help to contextualize the survey results.

According to data from Office of Agriculture Economic (OAE, 2025a), Jasmine rice is cultivated and harvested (paddy rice) from the northeast Thailand in the main season. When compared with the survey results with table below, more than half of the respondents reported cultivating and harvesting Jasmine rice during the main season (Na Pee). In the off-season, farmers mainly grow other varieties such as Hom Pathum, white rice, and sticky rice (OAE, 2025a).

Regarding the survey for the primary data, the two selected provinces are located in the Northeast region in Thailand, and both provinces are also key rice producing areas within the region. The table below presents the overall Jasmine rice productivity in Northeast Thailand, which includes data from both provinces.

Table 5.12 Quantity trends in Jasmine rice harvest types in Northeastern Thailand in 2020-2024 (Million tons).

Trend Category	Indicator	2020	2021	2022	2023	2024	Comparison with Primary Data
Production	Na Pee harvested in Northeast in Millions (Metric Tons) 3	8.13	8.24	8.05	8.41	8.44	This indicates that the majority of Jasmine rice cultivation in the main season, accounting for 52%.

Source: OAE (2020-2024)

Regarding World Bank data in 2024, and as shown in the table below, the cost of inputs over the past 3-5 years, particularly fertilizer, has increased across all types from 2020 to 2024 (World bank, 2024). This trend supports the primary data, where 81 percent of respondents reported rising input costs.

Table 5.13 Fertilizer prices for rice production in 2020-2024 (USD per ton)

Trend Category	Indicator	2020 \$/MT	2021 \$/MT	2022 \$/MT	2023 \$/MT	2024 \$/MT	Comparison with Primary Data
Input Cost	World fertilizer price (Ureas)	229	483	700	358	350f	Support in high input cost for Jasmine rice production.
	World fertilizer price (DAP)	312	601	772	550	600f	
	World fertilizer price (MOP)	217	543	863	383	300f	

Note: f= forecast.

Source: World Bank (2024)

According to data from the Office of Agricultural Economics (OAE, 2025c), the farm-gate price of Jasmine rice has shown an overall increase compared to 2020 (OAE, 2025c). However, survey results reveal that many respondents perceived the price as decreasing. This discrepancy may be due to factors such as rising input costs, which reduce net income despite higher selling prices.

In terms of global Jasmine rice prices, the table shows noticeable fluctuations (FAO, 2025b), which support 72 percent of farmers' concerns about the volatility of Jasmine rice prices.

Table 5.14 Jasmine rice farm-gate (Thai baht) and global price (USD) trends in 2020–2024

Trend Category	Indicator	2020	2021	2022	2023	2024	Comparison with Primary Data
Price Trends	Farm-gate price (THB/ton)	10,623	10,040	13,409	13,624	14,881	Reflects farmers' perception of decreasing prices.
	Global Jasmine rice price (USD/ton)	1,050.60	792.8	879.6	891.0	960.8	Supports farmers' concern about price volatility.

Source: OAE and FAO (2020-2024)

As shown in the table 5.15, Thai Jasmine rice exports have increased compared to 2020 (TREA, 2025). This trend aligns with farmers' perceptions reflected in the survey, where respondents gave a high mean score of 4.39 out of 5 with rice exports creating better income for Jasmine rice farmers. Similarly, the perception that global rice prices directly affect farmers' income received an average score of 4.28 out of 5 which confirms the link between international markets and farmers' income.

Table 5.15 Jasmine rice quantity (tons) and value (baht) in 2020-2024

Trend Category	Indicator	2020	2021	2022	2023	2024	Comparison with Primary Data
Jasmine rice export	Thai Hom Mali export volume (tons)	1,189,752	1,151,251	1,253,398	1,321,814	1,438,402	Represents steady growth, aligns with farmers' perception of export opportunities
	Thai Hom Mali export value (million baht)	40,999	32,097	38,053	42,840	49,308	Supports perception of income potential from exports
	Thai Hom Mali export value (million USD)	1,287.7	1,008.5	1,195.1	1,344.7	1,548.3	Supports perception of income potential from exports

Source: TREA (2025)

As the data below indicate, the government provides support beyond just Thai Jasmine rice. In this study, half of the Jasmine rice farmers received loans or informal debt relief through the Bank for Agriculture and Agricultural Cooperatives (BAAC, 2022). Other farmers also benefited from government programs such as input subsidies and price guarantee schemes.

Table 5.16 Government support programs for Thai rice farmers from 2020-2024

Trend Category	Indicator	2020	2021	2022	2023	2024	Comparison with Primary Data
Policy Support	Subsidy programs	Yes*	Yes*	Yes*	Yes***	Yes****	Matches primary data reporting of 25% receive input subsidies
	Guarantee price program	Yes**	Yes**	Yes****	No****	No****	corresponds to 16% of the farmers had this policy supported.
	Debt release or soft loan	Yes*	Yes*	Yes*	Yes****	Yes****	confirmed that 51% of respondents received support in the form of loans and Informal debt solutions for farmers and household members

Note: * = source from (BAAC) *The Bank for Agriculture and Agricultural Cooperatives (2022) p.268.*

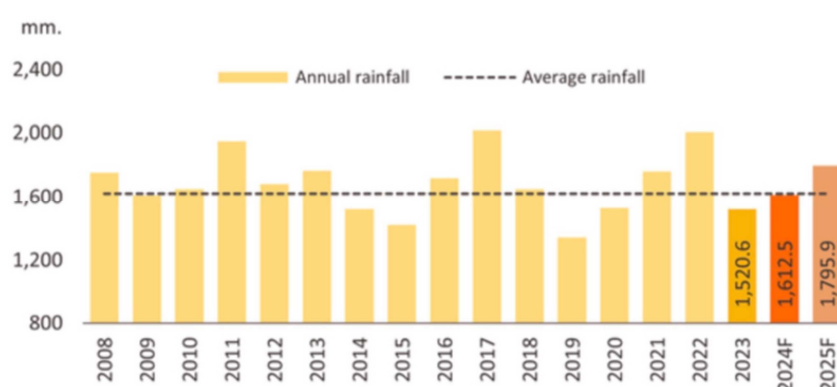
** = source from (FAO) *Food and Agriculture Organization of the United Nation (2020).*

*** = source from (USICT) *United States International Trade Commission (2025).*

**** = source from (USDA) *U.S. Department of Agriculture, Economic Research Service (2023c p.2, 2023b p.6 and 2024b)*

Source: compiled by the author

Figure 5.4 Trend of annual and average rainfall in Thailand.



Source: Sowcharoensuk (2024a)

According to the figure above, rainfall in Thailand in 2020 was significantly below average. Correspondingly, official statistics indicate one of the reasons that Jasmine rice yields in Northeastern Thailand were slightly lower in 2020 with 8.13 tons million tons compared to 2021 with 8.24 million tons (OAE, 2025a), confirming farmers' perception of weather events could affect rice production. In 2023, annual rainfall was also below the average, resulting in Jasmine rice production in Northeast Thailand of 8.41 million metric tons, which was slightly lower compared to 8.44 million metric tons in 2024 (OAE, 2025a).

Regarding competition from other rice-exporting countries, there are many alternative fragrant rice options, such as those from Cambodia and Vietnam, which allow price-sensitive consumers to switch to other sources. This observation supports the respondents' perception that competition from other rice-exporting countries affects the market for Thai Jasmine rice, reflected by a high mean score of 4.45 out of 5.

Table 5.17 Competing Rice Varieties in the Global Market.

Fragrant rice	2020	2021	2022	2023	2024
Thai Fragrant Rice	1050.6	792.8	879.6	891.0	960.8
Cambodia fragrant rice 5%	873.9	767.5	789.4	844.7	932.6
Vietnam fragrant rice 5%	491.1	511.2	449.8	580.6	626.7

Source: FAO (2025b)

According to the U.S. Department of Agriculture (USDA, 2025), the average rice yield per hectare in Thailand (all rice types) over the past 5 years was 2.82 tons per hectare (USDA, 2025e). In comparison, other rice-exporting countries such as Vietnam have almost triple the yield, averaging 6.08 tons per hectare over the same period (USDA, 2025f). This suggests that Vietnam's higher productivity is likely due to more intensive farming practices, use of high-yielding varieties, and efficient

irrigation systems, whereas Thailand's focus on premium aromatic varieties and smaller farm sizes limits yield potential.

Table 5.18 Rice yield average between Thailand and Vietnam (Metric ton/hectare)

Country	Average Yield (tons/ha)	Notes
Thailand (Jasmine rice)	2.82	Lower yield due to premium aromatic variety, higher labor costs, and smaller farm size.
Vietnam (Fragrant rice)	6.08	Higher yield due to high-input, intensive farming and varieties bred for volume rather than aroma.

Source: USDA (2025e and 2025f)

As above findings, these challenges suggest areas for potential improvement, such as, promoting more mechanization, optimizing input use, policy and adopting improved high yielding varieties, which could help Thai Jasmine rice achieve higher productivity while maintaining its premium quality.

Chapter 6: Conclusion and Limitations

6.1 Conclusion

As presented all information and findings in this thesis, the global market has been increasing influence on Thai Jasmine rice farmers and its export in several factors. Starting with the demographical information, most of farmers are in older age group, highlighting the challenge an aging farming population. Suggesting that Thailand Jasmine sector requires the participation from younger population to ensure in long-term continuity and competitiveness. Additionally, the findings also indicate that higher levels of education among farmers could play an important role in enhancing productivity, adopting sustainable practices, and improving the rice sector. With both aspects above highlight the importance of generational of Thai Jasmine rice production for the sustainable future. However, the finding also reveal that as large proportion of farmers belong to older age groups, with their long-standing experience in rice cultivation contributes positively and maintaining its rice quality and competitiveness in Thai Jasmine rice production.

In term of rice cultivation, also found that Thai Jasmine rice mostly produced during the main season, which highly dependent on rainfall, resulting as it is one of challenge on Thai rice farming as irrigation in Thailand are limit. To address this issue, strengthening irrigation systems, promoting water management innovations and efficient infrastructure system could help reduce risks and improve productivity for Thai rice farmers.

The findings also revealed that input cost for Jasmine rice production also increased compared to 2020, such rising in global fertilizers. This increase is effect on farmers' profitability. To address this challenge, continued policy support in the form of cost subsidies for farmers, along with initiatives that encourage farmer cooperatives to negotiate bulk discounts on inputs, would help farmers in cost price stabilization for the production of rice, thus, improving long-term competitiveness for Thai Jasmine rice.

The global rice market also challenges farmers' profitability through price fluctuations, and currency exchange variations further directly effects on Thai rice market. Despite the farm-gate rice had increased compared to 2020, however, this discrepancy may be due to factors such as rising input costs, which reduce net income for farmers.

Additionally, the global rice market challenges farmers' profitability through price fluctuations, and currency exchange variations further impact the Thai rice market. As shown before, although global rice prices have fluctuated, farm-gate prices have increased compared to 2020. This discrepancy may be attributed to rising input costs, which reduce farmers' net income despite higher selling prices. To address this concern, continuing supporting through income guarantee program or financial tools such as insurance or forward contract to help both farmers and exporters to receive income that doesn't fluctuate much because of market prices or currency changes.

Enhancing irrigation systems and promoting water management innovations not only help to reduce risks in case of limit of water from rainfall for Jasmine rice production but also reduce the risk from weather condition such as drought. Recently the world climate change is unpredictable, support from cooperatives and government programs, such as subsidies for water infrastructure or drought insurance, would also enhance farmers to stabilize production.

International competition is one of the challenges facing the Thai Jasmine rice sector in the global market. Thailand is not the only rice producer in the world, as Thai Jasmine rice also competes with fragrant rice produced by other countries like Cambodia, Vietnam, and India. This situation presents on Thai Jasmine rice farmers in keeping maintain competitiveness in premium quality. To address challenge, measures such as improving production efficiency, enhancing rice quality standards and Thai Jasmine rice's promotion of branding could help strengthen its position in the global market.

Lastly, improving rice productivity is essential for Jasmine rice sector in Thailand. The findings reported that rice yield per hectare in Thailand is lower than in other exporting countries such as Vietnam. Enhancing productivity would not only benefit Jasmine rice farmers but also all type rice farmers, as it could increase profitability by reducing production costs and making Thai rice more competitive in the global market.

6.2 Limitations of the study

This study is applied a quantitative methodology, by primary data from collection of 100 Thai Jasmine rice farmers in Udon Thani and Khon Kean provinces, and the secondary data to support complement the survey findings. For future research, it is recommended to expand the primary data collection to include more provinces in Northeastern Thailand to improve representativeness.

Moreover, information on surveys such as yields, costs, and prices relies on respondents, which some could be inaccurate. The study focused on 5 years trends, hence longer-term changes or climate variability may not be fully captured.

Secondary data may not include all variables of interest such as farmers' perceptions or local market challenges. Therefore, it cannot fully replace primary data. The differences in units in secondary data with some reports using tons and others using tonnes or define harvested area could make direct comparison with primary data differently.

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ANNEX

Survey Questionnaire for Jasmine Rice Farmers

This survey is part of an academic research study. The purpose is to understand the experiences, challenges, and perspectives of Thai Jasmine rice farmers regarding production, its cost and market dynamics. Most questions ask about your general experiences over recent years, while a few ask about your most recent harvest (2024). The responses will remain confidential and used only for research purposes. Your steady responses are essential, and we invite you to answer the questions as openly as possible

Section A: Demographic Information

1. Age:

- ☐ Less than 35 years old
- ☐ 35-45 years old
- ☐ 46-55 years old
- ☐ 56-64 years old
- ☐ More than 65 years old

2. Gender:

- ☐ Male
- ☐ Female
- ☐ Prefer not to say

3. Education level:

- ☐ No formal education
- ☐ Primary school
- ☐ Secondary school
- ☐ Higher education (college/university)

4. Years of Experience in Rice Farming:

- ☐ Less than 5 years
- ☐ 5-10 years
- ☐ 11-15 years
- ☐ 16-20 years
- ☐ More than 20 years

Section B: Production Practices (in general)

5. The land where you grow Jasmine rice is:

- ☐ Owned
- ☐ Rented/Leased
- ☐ Both owned and rented

6. On average, how many harvests of Jasmine rice do you produce per year?

- ☐ One harvest
- ☐ Two harvests
- ☐ More than two harvests

7. What type(s) of Jasmine rice farming do you practice?

- Na Pee (Wet-season rice) harvest in (October – December)
- Na Prang (Off-season rice) harvest in (March – May)
- Both

8. Over the past 3–5 years, have your production costs (seeds, fertilizers, labor) changed?

- Decreased
- Remained the same
- Increased

9. What are the biggest challenges you generally face in Jasmine rice production? (Check all that apply)

- High input costs
- Water shortage/drought
- Pests and diseases
- Limited labor
- Access to technology (machinery)
- Other

Section C: Market and Selling Practices (in general)

10. Do you sell your Jasmine rice in term of:

- Paddy rice
- Milled rice

11. Do you sometimes store your Jasmine rice after harvest to wait for a higher price before selling?

- Yes, often
- Yes, sometimes
- Rarely
- Never

12. If you store rice before selling, what is the main reason?

- To wait for a better price
- Lack of immediate buyers
- Limited storage capacity (forced to sell quickly)
- Other

13. Who do you mainly sell your Jasmine rice to?

- Local traders
- Private rice millers
- Cooperatives
- Export companies
- Retailers
- Government
- Middlemen

- Other
14. What are the biggest market/selling challenges you face? (Check all that apply)
- Low farm-gate prices
 - Dependence on middlemen/brokers
 - Lack of bargaining power
 - Price volatility/uncertainty
 - High transport/logistics costs
 - Lack of direct access to mills/exporters
 - Quality/grade deductions by buyers
 - Limited market information (e.g., export or wholesale prices)
 - Other
15. In general, how do you feel about the trend of Jasmine rice prices in the past 3 years?
- Prices have decreased
 - Prices have stayed the same
 - Prices have increased
16. Do you usually know whether your rice is exported abroad?
- Yes
 - No
 - Not sure

Section D: Perceptions on Global Market Dynamics (in general)

(Use the scale: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree)

Content	1 Strongly Disagree	2 Disagree	3 Neutral	4 Agree	5 Strongly Agree
17. International demand affects the price of Jasmine rice in Thailand.					
18. Global rice prices directly impact my income as a farmer.					
19. Government policies help me deal with market price fluctuations.					
20. Export opportunities create better income for Jasmine rice farmers.					
21. Competition from other rice-exporting countries (e.g., Vietnam, India, Cambodia) affects the market for Thai Jasmine rice					
22. Climate change and extreme weather events will affect Jasmine rice production in the future.					
23. Do issues or conflicts between Thailand and Cambodia affect your Jasmine rice production in 2025?					

Section E: Context – Recent Year

24. In 2024, approximately how many tons of Jasmine rice did you harvest?

- ☐ Less than 10 metric tons
- ☐ 11-20 metric tons
- ☐ 21-30 metric tons
- ☐ 31-40 metric tons
- ☐ 41-50 metric tons
- ☐ More than 50 metric tons

25. In the last 3 years, which items were the most costly in your Jasmine rice production? (Select all that apply)

- ☐ Seeds
- ☐ Fertilizer
- ☐ Pesticides / Herbicides
- ☐ Labor (hired workers)
- ☐ Machinery rental or maintenance (e.g., tractor, harvester)
- ☐ Fuel (diesel, gasoline)
- ☐ Water / Irrigation costs
- ☐ Land rent/lease payments
- ☐ Transportation of rice
- ☐ Other

26. Which type of government support has helped you the most in recent years? (Select all that apply)

- ☐ Price guarantee program
- ☐ Subsidy for inputs (seed, fertilizer, fuel, etc.)
- ☐ Debt relief or soft loans
- ☐ Training/technical support
- ☐ Access to irrigation projects
- ☐ Marketing/export support
- ☐ Other

27. How satisfied were you with the price you received for your Jasmine rice in 2024?

- ☐ Very dissatisfied
- ☐ Dissatisfied
- ☐ Neutral
- ☐ Very satisfied