Agribusiness Journal
https://usnsj.id/index.php/AJ
journalagribusiness@gmail.com
e-ISSN: 2548-2211, p-ISSN: 2548-379X

DOI : https://doi.org/10.31327/aj.v8i1.2330

Study on the Development of Indonesia and Malaysia Shallot Imports

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Abstract

This study analyses shallot import trends in Indonesia and Malaysia from 2010 to 2023. Indonesia, while a net exporter, experiences fluctuating imports, primarily due to seasonal production variations and occasional supply shortfalls. Malaysia, lacking significant domestic production, consistently relies heavily on imports, primarily from India. The study utilises a descriptive qualitative method, incorporating both primary (interviews, observations) and secondary data (government reports, trade statistics). Key findings highlight Brebes, Indonesia, as a major shallot production centre, employing technologies like Controlled Atmosphere Storage (CAS) to extend shelf life. Data mining techniques, specifically linear regression, are used to predict shallot yields based on factors like land area, fertiliser use, and labour. Despite improved productivity per hectare, total production in Brebes fluctuated, indicating challenges in maintaining production scale. Malaysia's shallot import dependence is underscored by its reliance on 24 countries, with India being the largest supplier. MARDI's efforts to cultivate local shallot varieties represent a step towards self-sufficiency. The study examines factors driving imports, including resource limitations, consumption needs, competitive advantages, and economic policies. The instability of shallot production, particularly during the rainy season, contributes to price fluctuations. The analysis concludes by emphasising the need for both countries to enhance domestic production through technological advancements, improved cultivation techniques, and supportive government policies to reduce import dependence and stabilise prices.

Keywords: Shallot Imports, Production, Indonesia, Malaysia

A. Introduction

Shallots play an important role in the national economy, especially because the land conditions in Indonesia are very supportive of their growth. Based on BPS data for 2019-2023, Indonesia has managed to earn 47.39 million USD from shallot exports, and also in that period, Indonesia imported shallots with a value of 6 million USD.(Pusat Data dan Sistem Informasi Pertanian Kementerian Pertanian Sekjen Kementan, 2024). Policies that support this include Peraturan Menteri Pertanian No. 3 of 2012 concerning the Recommendation for Importing Horticultural Products (RIPH), which has succeeded in reducing the volume of shallot imports. Data shows that Indonesia's shallot exports have continued to increase fluctuatingly in the 2017–2021 period, with a trade balance that is in surplus. Through the 2013 RIPH policy, Indonesia has succeeded in transforming from a shallot-importing country to an exporting country. (Naibaho, 2022).

Shallots are one of the horticultural crops with great potential due to increasing demand, supported by their use as a daily cooking ingredient by the majority of the population. In addition, Indonesia's climate is suitable for shallot cultivation, further strengthening its position as a commodity strategy. However, the gap between production and consumption is one of the factors

that encourages the government to regulate international trade through imports and exports(Wulandari & Lubis, 2019).

The government's seriousness in managing shallot trade is reflected in the policy of cutting import volumes, which fell drastically from 17.4 thousand tons in 2015 to only 1.2 thousand tons in 2016(Kemendag, 2022). Starting in 2017, shallot imports are only intended for seed needs, so that Indonesia is no longer a net importer. The import restriction policy has an impact on the reduced supply in the domestic market. This has the potential to increase prices if domestic production does not meet demand. However, the policy also supports the protection and development of local shallot cultivation. (Pane & Supriana, 2020).

In addition to government policies, other factors that affect import volume are domestic prices and import prices. If domestic prices are higher, consumers tend to choose more competitive imported products. High levels of public consumption, but not balanced by sufficient production, also affect import volume. The rupiah exchange rate is also an important variable; a weakening exchange rate will make imported products more expensive. (Purwaning Astuti & Juniwati Ayuningtyas, 2018).

Shallot exports also play an important role in economic growth. In 2023, Indonesia was able to export 9.477 thousand tonnes of shallots with a total export value of 11.786 million USD. However, the export volume in the last five years (2019-2023) shows fluctuations. For example, in 2018 and 2019, the export volume showed an increase from 6.26 tonnes to 8.76 tonnes. However, from 2019 to 2022, the trend of shallot exports declined and reached its lowest point in 2022. However, in 2023, there was a sharp increase in the shallot export volume of around 269%(Pusat Data dan Sistem Informasi Pertanian Kementerian Pertanian Sekjen Kementan, 2024)The decline in exports in 2020 and 2021 was caused by the COVID-19 pandemic, which hampered global trade activities. (Kemendag, 2022). Factors such as export prices, the rupiah exchange rate, and domestic production affect export volumes. High export prices, coupled with the strengthening of the rupiah exchange rate, make products expensive in the international market. Conversely, increasing domestic production that meets national needs allows for increased exports. (Surbakti et al., 2023).

Based on the description above, the objectives of this research are: 1) to analyse Indonesia's shallot import trend, 2) to analyse Malaysia's shallot import trend, and 3) to analyse shallot import fluctuations in Indonesia and Malaysia.

B. Methodology

This research was conducted at the Malaysian Agricultural Research and Development Institute (MARDI). The research method used in this research is a descriptive research method with a qualitative approach, namely data expressed in the form of words, sentences or not in the form of numbers. (Agung & Yuesti, 2019). Data collection was carried out through primary data sources and secondary data sources. Primary data sources namely the results of interviews and observations. While secondary data sources, namely reliable sources such as the annual reports of the Department of Agriculture Malaysia, publications from MARDI, and trade statistics from the Department of Statistics Malaysia and Comtrade, focus on the period 2010 to 2023. The time series analysis method was applied to evaluate patterns and trends in production, prices, and climatic and weather factors affecting shallot production. In addition, descriptive methods were used to describe the characteristics of the data, including distribution, mean, and variability. Descriptive analysis helps in understanding the relationship between factors such as agricultural technology, climate and land area with production outcomes and why imports are needed. The observation method is used by researchers when they want to know empirically about the phenomenon of the observed object.

C. Findings and Discussion

Shallot Farming in Indonesia

Brebes is the largest shallot centre in Indonesia, contributing around 18.5 per cent of the total national production and 57 per cent of the total production in Central Java. The shallot harvest from Brebes is not only used to fulfil domestic needs, but is also exported to meet international demand. With Controlled Atmosphere Storage (CAS) technology, shallots from Brebes can last up to six months without quality loss. (Tempo, 2024). In addition, to ensure yield stability, data mining technology based on simple linear regression algorithms can be applied as a predictive

tool that supports more efficient and sustainable management of shallot production and distribution. The linear regression algorithm was able to identify the pattern of relationships between variables such as land area, fertiliser use, labour and pesticides on production yield. The model provides an R^2 score of 0,98% indicating excellent predictive ability. The implementation of this method is expected to help farmers and related parties make better decisions in maintaining the stability of shallot yields, both for domestic and export needs. (Maulana et al., 2023).

Table 1. Data on Harvested Area, Production, and Productivity of Shallot in Brebes Regency (2019-2023)

Year	Harvest area (ha)	Production (kw)	Productivity (kw/ha)
2019	29.151	3.029.328	103,92
2020	38.951	4.016.155	103,11
2021	33.719	3.744.437	111,05
2022	32.509	3.836.802	118,02
2023	24.344	2.894.956	118,92

Source: (Badan Pusat Statistik Kabupaten Brebes, 2024)

The table shows the trend of shallot production in Brebes District from 2019 to 2023, with significant fluctuations. Although the harvested area tends to decrease, especially in 2023, when it only reaches 24,344 hectares, shallot productivity per hectare increases, reaching a high of 118.92 kg/HA in 2023. The decline in harvested area and total production, from 4,016,155 KW in 2020 to 2,894,956 KW in 2023, indicates challenges in production scale, despite improved efficiency per hectare. This reflects the potential for improved agricultural technologies or practices that support productivity even with more limited land.

Shallot Farming in Malaysia

In Malaysia, shallots are a staple ingredient used in almost every dish. This causes the demand for shallots to continue to increase every year, along with the growth of the population. However, until recently, Malaysia had no commercial production of shallots, so it had to import 100% of its shallot needs from other countries. This dependence on imports poses challenges, especially regarding the volatile world market prices, which put great pressure on domestic consumers.

Malaysia imports shallots from 24 countries, with the top five suppliers being India (38%), Pakistan (23%), China (16%), the Netherlands (8%) and Thailand (8%). The per capita consumption rate of Malaysians averages 17kg per year, or about 1.4kg per month. Thus, the national demand is estimated to be almost 36,000 tonnes per month.

To reduce dependence on imports, the Malaysian Agricultural Research and Development Institute (MARDI) has been mandated to produce shallot seeds. Meanwhile, the Department of Agriculture (DOA) and Lembaga Pertubuhan Peladang (LPP) are responsible for commercialising the seeds to parties interested in developing shallots locally.

On 3 April 2024, Perak became the first state in Malaysia to successfully harvest BW1 local shallots. This first harvest yielded around 2.3 tonnes of shallots grown in Kampung Ladang Bikam, Tanjung Malim. This success is the first step for Malaysia in reducing shallot import dependency and promoting self-sufficiency in the future.(Bharian, 2024).

Market for the Indonesian and Malaysian Shallot Industry

Countries import due to various factors that affect their economic and social needs. One of the main factors is the limitation of natural resources; some countries may not have enough resources or the specific types needed to fulfil domestic demand. In this situation, imports become the solution to fill the gap.

In addition, consumption needs also play an important role, especially when demand for a particular good exceeds domestic production capacity or when there is a need for a variety of products that are not available locally. Competitive advantage is also a driver of imports, where countries prefer to import goods from countries with lower production costs, better quality, or more advanced technology.

Economic and trade policies, including international agreements, influence import decisions by providing better market access or reducing tariffs. Crises or temporary shortages, such as natural disasters or production disruptions, can also force a country to increase imports to ensure a steady supply of essential goods. Developing countries often import equipment and technology to support economic development, including investment in infrastructure and industrial development. As such, imports are an important strategy that allows countries to fulfil domestic needs, support local industries and capitalise on international advantages.(Almajid & Sentosa, 2022).

The demand for shallots continues to increase in line with the growing population, necessitating intensive efforts to increase production to fulfil national demand. However, the gap between production and consumption remains a major challenge. This gap not only occurs in terms of quantity, but is also related to timing, which causes shallot imports to still be required. In general, the shallot growing season (in season) takes place during the dry season. In contrast, during the rainy season (off-season), farmers tend to be reluctant to plant shallots due to the high risk of disease attack. In addition, seed prices during the rainy season are relatively more expensive due to limited supply, resulting in unstable production. This instability results in price fluctuations in the market, especially since shallots are a perishable commodity. This combination of factors points to the need for better strategies to manage shallot production and distribution throughout the year.(Pusat Data dan Sistem Informasi Pertanian Kementerian Pertanian, 2022).

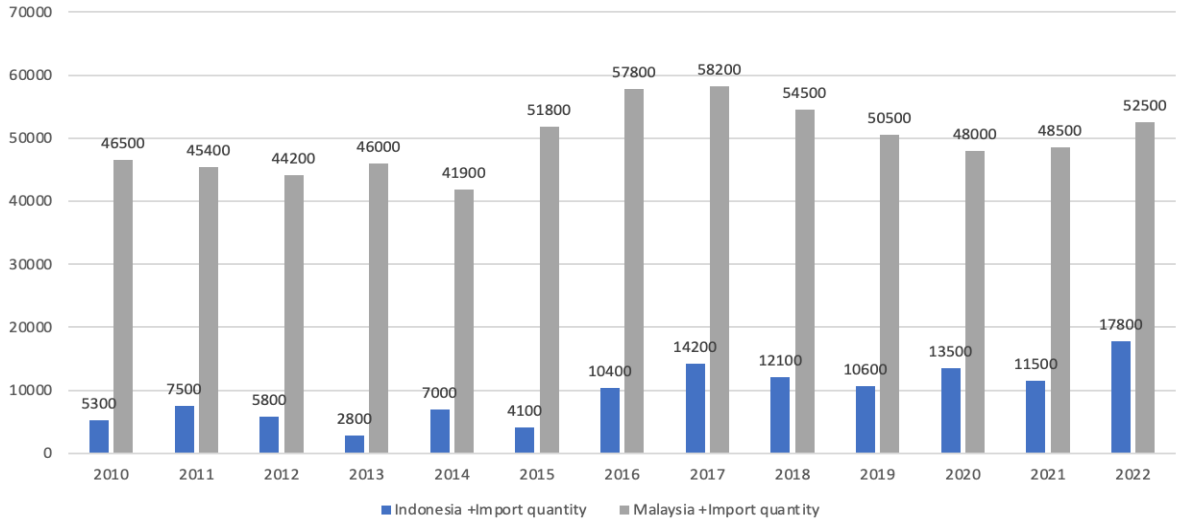

Figure 1. Indonesia-Malaysia Shallot Import Data from 2010-2022 (Ton)
Source: (FAO, 2024)

In general, the figure above shows several things, namely:

- Differences in Import Volume: Malaysia's shallot import volume is consistently much larger than Indonesia's over the period. This indicates that Malaysia relies heavily on shallot imports to fulfil its domestic needs, while Indonesia mostly fulfils its needs from domestic production.
- Malaysia's Import Trend: Malaysia's shallot import volume tends to be stable with little fluctuation over the period 2010-2022, hovering around 44,000 to 58,000 tonnes. The largest increase was seen in 2016 (58,200 tonnes), indicating the high demand for shallots in that year.
- Indonesia's Import Trend: Indonesia's shallot import volume is relatively smaller than Malaysia's, with significant fluctuations. For example, there were spikes in imports in 2017 (14,200 tonnes) and 2022 (17,800 tonnes). This is most likely due to domestic conditions such as decreased production due to a sub-optimal growing season or increased market demand.
- Dependence on Imports: Malaysia appears to be more import-dependent than Indonesia, which is in line with the fact that Malaysia does not have large-scale commercial production of shallots. In contrast, Indonesia has considerable shallot production, despite occasional deficits that require imports.
- Supply Stability and Crises: Import spikes in certain years, such as 2016-2017 for Malaysia and 2022 for Indonesia, may be due to external factors such as global supply disruptions, climatic conditions, or changes in trade policies.

Overall, this data illustrates the difference in dependence between the two countries on shallot imports, with Malaysia relying more on the international market than Indonesia. This phenomenon also reflects each country's domestic production conditions as well as economic and trade factors that influence import decisions. A country's need for a commodity can sometimes unable to be fulfilled by domestic production due to various reasons. The lack of efficiency in fulfilling needs, if produced domestically, encourages a country to prefer to import the needs of these inefficient commodities rather than producing them themselves. Traffic between countries in the current era of globalisation is becoming increasingly open, so that the movement causes countries to become interrelated with each other. The existence of this movement is also able to cause increasingly fierce competition between competing countries. This competition then results in the concept of competitiveness, which looks at the ability of a product to survive against the challenges contained in the competition itself.

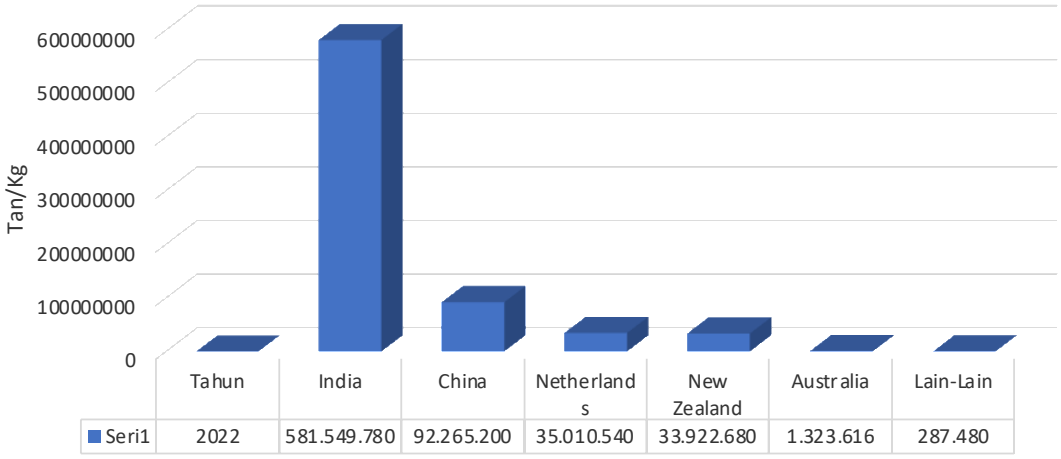

Figure 2. 5 Top Shallot Exporting Countries to Indonesia in 2022
Source: (UN Comtrade Database, 2024)

The figure above shows that India was the largest exporter of shallots to Indonesia in 2022. The amount of shallot imports from India is very large, far exceeding the amount of imports from other countries. China is in second place, followed by the Netherlands, New Zealand, and Australia. There is also an 'Other' category. This includes imports of small quantities from various other countries. This figure clearly shows that Indonesia is heavily dependent on imports from India. This shows that domestic shallot production is still unable to fulfil all of Indonesia's consumption needs. Possible causes include production fluctuations due to extreme weather conditions, technology/infrastructure, or sub-optimal cultivation techniques and land area. Dependence on shallot imports has a significant impact on the stability of shallot prices and supply in the country. Price fluctuations in exporters' home countries and changes in international trade policies can have a direct impact on shallot prices in Indonesia. In addition, dependence on a few key supplying countries also increases the risk of supply disruptions in the event of production or export problems in those countries.

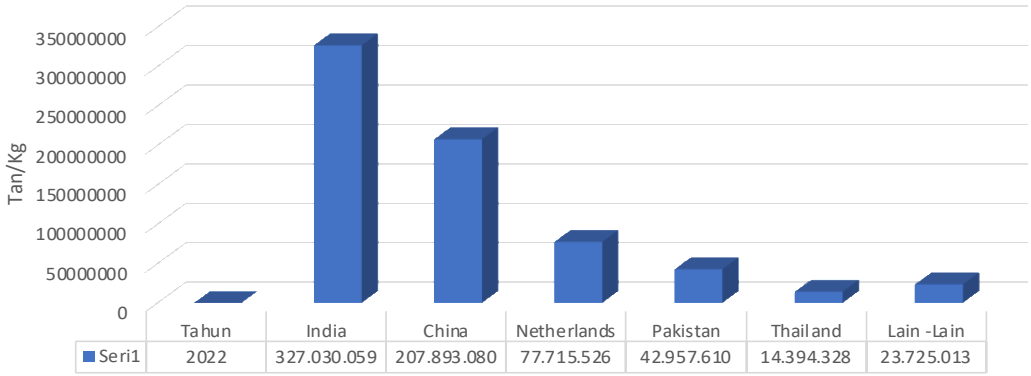

Figure 3. 5 Top Shallot Exporting Countries to Malaysia in 2022
Source: (UN Comtrade Database, 2024)

The figure above shows Malaysia's shallot imports in 2022 show a very high dependence on India as the main supplier. Based on the data, India accounts for 327,030,059 kg or the largest portion of Malaysia's total shallot imports, showing significant dominance over other countries. China became the second largest supplier with 207,893,080 kg, followed by the Netherlands with 77,715,526 kg, Pakistan with 42,957,610 kg, and Thailand with 14,394,328 kg. Meanwhile, the 'others' category represents a mix of other smaller countries that supplied around 23,725,013 kg. India's striking dominance highlights Malaysia's dependence on a single country as the main source of shallot supply. This dependence has strategic implications, especially in terms of price and supply stability, as any disruption to shallot production or exports from India, such as natural disasters or export policies, could lead to significant price fluctuations in the Malaysian domestic market. This emphasises the importance of diversifying import sources to reduce the risk of dependence on a single country.

Indonesia and Malaysia are highly dependent on shallot imports, especially from India. This dependence is due to several factors, including the lack of domestic production, unstable climatic conditions, and limited agricultural land. A further obstacle is the low quality of local varieties. Therefore, both countries need to import large quantities to fulfil consumer demand. This dependence on imports makes domestic shallot prices vulnerable to price fluctuations in the world market. To overcome these problems, both countries need to increase domestic production through government support in the form of developing better quality varieties, improving cultivation techniques, and providing agricultural facilities and infrastructure.

From the figure above, the shallot imports of Indonesia and Malaysia show that there are some similarities and differences. Both countries rely on India as a major supplier, indicating India's dominance in the global shallot market. However, Indonesia's import volume is much larger, indicating higher domestic demand or insufficient local production. Factors such as population size, climatic conditions, agricultural technology, and government policies are the main determinants of differences in import volumes. These importing countries can generally be categorised as developing countries with significant agricultural sectors and have close trade relations with major shallot-producing countries.

Table 2. Reasons for selecting the source countries for shallot imports

Countries	Explanation
India	India's dominance as the world's shallot exporter cannot be separated from a number of supporting factors. Ideal climatic conditions, the application of modern technology in agriculture, large-scale production at low cost, and adequate infrastructure have made India the largest producer of shallots. In addition, the long experience of Indian farmers and government support for the agricultural sector, especially exports, have also strengthened India's position in the global market. This combination of factors has made **shallots** from India a highly desirable commodity for many countries, including Indonesia and Malaysia.
China	China's dominance as one of the world's largest exporters of shallots is supported by several key factors. Adequate planting land area and suitable climatic conditions have created an optimal environment for shallot cultivation. The application of modern agricultural technologies, such as proper fertilisation techniques and effective pest control, has improved the productivity and quality of Chinese-produced shallots. Low production costs, thanks to affordable labour and large production scale, allow China to offer competitive prices in the global market. Strong infrastructure, including storage facilities and an efficient transport network, supports smooth shallot distribution. Government policy support, such as subsidies and ease of export, further strengthens China's position as a reliable supplier of shallots to importing countries such as Malaysia and Indonesia.
Netherlands	Although not as big as India or China in terms of production volume, the Netherlands has managed to become one of the major players in global shallot exports. The Dutch advantage lies in its highly advanced agricultural technology and efficient infrastructure. Sophisticated irrigation systems, the

	use of high-yielding varieties, as well as proper fertilisation techniques, have resulted in consistently high-quality shallots. In addition, the Netherlands' excellent logistics system, including modern storage facilities and a distribution network, ensures that shallots arrive at their destination markets in optimal condition. A focus on product quality and adherence to international standards has also been key to the Netherlands' success. Strong government support for the agricultural sector and favourable export policies further strengthen the Netherlands' position as a trusted supplier of shallots to many countries, including Malaysia and Indonesia.

Source: author's analysis

From the figure above, India, China and the Netherlands each have unique comparative advantages in shallot production and exports. India excels in large-scale production, supported by suitable climatic conditions and abundant labour. China relies on modern technology and production efficiency to produce large quantities of shallots at competitive prices. Meanwhile, the Netherlands focuses on high product quality, supported by advanced agricultural technology, good logistics systems and strict quality standards. These three countries have managed to dominate the global market with different, yet complementary strategies. India and China supply the market with large volumes, while the Netherlands fulfils the demands of a market that wants premium quality. These differences show that success in the shallot industry is not determined by just one factor, but by a combination of factors such as climate, technology, infrastructure, and government policies.

Table 3. Factors Affecting Production in Indonesia

No.	Factor	Statement
1.	Technology/ Infrastructure	Farming business carried out by farmers in Arjasa Village although the land area cultivated is a lot but the cultivation technology used is still fairly traditional so that the level of productivity produced is not influenced by land area, so the size of the narrow land area will not affect the ups and downs of shallot farming productivity(Puryantoro & Wardiyanto, 2022).
		The rate of increase in production is weak because farmers are still processing coffee traditionally. Traditional processing methods still use conventional methods such as drying using sunlight, roasting using firewood, and breaking coffee using the manual pounding method. This is the background for the government to take a step by providing technological assistance gradually(Santoso et al., 2021).
2.	Climate	Facts on the ground show that the impact of climate change, especially drought and flooding, can reduce food crop production, especially rice, and even worse, crop failure due to damage to Agricultural Infrastructure(Priyanto et al., 2021).
		Climate anomalies such as changes in rainfall intensity and patterns, increases in air temperature, drought, flooding, and increased intensity of pest and disease attacks are symptoms of climate change that can have an impact on the productivity of crops, especially food crops This makes climate change one of the serious challenges that must be faced by various countries in the world in fulfilling food needs, including Indonesia and Malaysia(Malau et al., 2023).
3.	Land Area	The area of land planted will affect the number of plants that can be planted, which in turn can affect the amount of shallot production(Hasri et al., 2020).
		Land area is a factor that greatly affects the production of rice farming because the larger the land area of rice farming, the greater the production results obtained, while the narrower the land area of rice farming, the production results will decrease(Wulan et al., 2022).

Based on the table above, the decline in production in Indonesia is caused by several complex factors. Lack of optimisation of production factors such as land area, agricultural technology, and climatic conditions is the main cause. A large land area does not necessarily guarantee high productivity if it is not supported by adequate technology. The use of traditional agricultural technology and inadequate infrastructure also hampers the increase in production. In addition, extreme climate changes such as droughts and floods can damage crops. Other factors that need to be considered are the availability of quality seeds and natural conditions during planting. This decline in production has an impact on supply in the market, resulting in higher commodity prices. To overcome this problem, efforts are needed to increase productivity through the adoption of modern technology, the development of superior varieties, and improvements in agricultural infrastructure.

Table 4. Factors Affecting Production in Malaysia

No.	Factor	Statement
1.	Technology/ Infrastructure	One of the causes of international trade is due to differences in natural resources owned, differences in geographical conditions, climate, technology, economic structure, quality of labour, and social and political(Hardianto et al., 2020).
		Technology has played an important role in influencing production factors in Malaysia, especially in the agricultural and industrial sectors. The adoption of advanced technologies such as automation and data management systems has increased production efficiency and reduced operating costs. For example, the use of drones in crop monitoring and big data processing systems for market analysis has helped farmers and entrepreneurs increase yields and maximise profits. This shows that technology integration not only improves productivity but also supports sustainable economic growth in Malaysia(Wee Wei En & Shou Hui, 2023).
2.	Climate	Production continuity has not been fulfilled, which is often caused by weather changes, so that farmers experience crop failure (Pakpahan et al., 2022).
		Currently, the trend of climate variability is increasing and is expected to continue to increase, causing disruptions to the agricultural sector, especially rice farming. Grain production in Malaysia is at risk due to climate variability, rainfall uncertainties, and temperature fluctuations(Shabri et al., 2021).
3.	Land Area	Agricultural land area is something that is very important in the production process. In rubber production, for example, the ownership of a narrow land area is less optimal than a large land area; the production process will be adjusted to the land area(Kusrini & Novandalina, 2018).
		Land area has a significant effect on imports and exports. The more plantation land that is cultivated, the production produced in quantity tends to increase, so that it can increase Indonesia's imports and exports to Malaysia and vice versa. (Rahmatul Putri et al., 2021).

Based on the table above, it shows that factors such as technology, climate, and land area have a significant influence on agricultural production. The adoption of modern technology, such as automation and data management systems, has improved production efficiency in countries such as Malaysia, but increasingly extreme climate change poses a major challenge to the agricultural sector. On the other hand, adequate land area is an important factor in increasing production. These factors show that agricultural production is heavily influenced by a combination of natural factors, technology, and government policies. In the context of international trade, these differences in factors of production are one of the causes of trade between countries. For example, Indonesia and Malaysia have a close trade relationship, especially for commodities such as shallots. However, price remains the main determining factor in trade, both at the domestic and international levels.

D. Conclusion

Based on the results of research conducted by researchers, it can be concluded that:

1. Malaysia has a logistical advantage through blending and storage facilities that allow the blending of various qualities of fuel oil (BBM) from refineries in various countries. This facility produces products that meet the specific needs of buyers, including Indonesia. This logistics infrastructure advantage can be a lesson for Indonesia to strengthen the competitiveness of agricultural products such as shallots. By building similar infrastructure, Indonesia can optimise the management and distribution of agricultural products to support domestic and international markets.
2. The main factors affecting the volume of Indonesian shallot exports to Malaysia include Malaysia's real GDP, the exchange rate of the rupiah against the ringgit, Malaysia's population, export prices, and domestic shallot production. An increase in Malaysia's real GDP and population increases the purchasing power and demand for shallots in the country. Meanwhile, the appreciation of the rupiah makes Indonesian shallots more expensive in the Malaysian market, thereby reducing export volumes. On the other hand, competitive export prices and abundant shallot production in Indonesia encourage increased exports.
3. Indonesia's shallot import volume is influenced by domestic prices, consumption, domestic production, and the rupiah exchange rate. When shallot prices in the domestic market and domestic consumption increase, import volumes tend to increase to fulfil market needs. Conversely, increased domestic production reduces dependence on imports. In addition, the rupiah exchange rate has a significant impact on Indonesia's shallot exports and imports. The appreciation of the rupiah reduces the price competitiveness of Indonesian shallots in the international market, thereby suppressing export volumes. Conversely, rupiah depreciation increases the competitiveness of export products but increases import costs. In addition, world export prices have a positive effect on Indonesian shallot exports, while domestic prices and domestic shallot production have a negative effect. These findings suggest the importance of exchange rate stabilisation and production optimisation to support Indonesia's shallot trade balance.

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