

The King of Fruits Dilemma in Malaysia: Discovering Durian Export Challenges to China

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ABSTRACT

This study delves into the challenges encountered by Malaysian durian farmers in exporting durians to the Chinese market, with a specific focus on critical factors such as durian supply, the logistics system, and consumer preferences. To scrutinize these challenges, a qualitative research methodology was employed, involving interviews with durian exporters based in Pahang, Malaysia. The exportation rate of Malaysian durians to China is significantly influenced by various factors, including durian supply, the efficiency of the logistics system, and consumer preferences. Additionally, this research has unveiled additional challenges, such as the need for quality control and pest management on durian plantations. The study primarily concentrated on data collection in Pahang state due to its pivotal role in durian exports to China. Future research endeavors could broaden the scope to include other notable durian plantation regions in Malaysia, such as Penang and Kelantan. This study contributes valuable insights to the knowledge base, shedding light on the challenges inherent in the Malaysian durian export industry.

Keywords: Export Challenges, Durian Supply, Logistic System, Consumer Preferences

1. INTRODUCTION

Durio zibethinus, commonly referred to as durian in Malaysia, is a tropical fruit with a distinctive sense of taste and texture (Cabi, 2019). The name "durian" itself is derived from the Malay word "duri," which means "thorn," and the suffix "-an" was added, signifying its spiky appearance (Aziz & Jalil, 2019). Malaysia, geographically situated near the equator, enjoys a unique combination of soil composition and climatic conditions that, when coupled with an array of excellent durian plant varieties, contributes to the production of high-quality Malaysian durians. Among the notable durian cultivars found in Malaysia are D101, D24, Tekka, D13, Golden Phoenix, D1, D17, Mao Shan Wang, Black Pearl, Black Thorn, Red Prawn, and Hor Lor (Ong, 2019). Moreover, various traditional harvesting methods have a significant impact on the quantity of durians that can be successfully harvested. To meet the demand of global consumers and allow them to enjoy Malaysian durians, the Malaysian Department of Agriculture introduced the concept of frozen fresh-keeping durians for export (Nordin, 2019). This innovative approach, however, introduced complexities in terms of time and cost due to the utilization of liquid nitrogen during the freezing process (Cai, 2019).

With durians often referred to as "gold" in Malaysia, the government has initiated efforts to encourage the transformation of palm oil plantations into durian plantations. This strategic move is aimed at elevating Malaysia's durian production capacity, aligning it with the surging demand for durians, particularly in China. Durian, in recent times, has transformed into a lucrative source of income within the agricultural industry (Suntharalingam, 2017). Malaysia has been exporting durians to several nations, including not only China but also Singapore, Indonesia, and Hong Kong. These four countries are prominently ranked as the leading importers of Malaysian durians (Yusof, 2020). Consequently, durian exportation to China has evolved from being a secondary income source to a pivotal profit generator. This growth in the durian industry has created fresh employment opportunities, thereby contributing to the overall economic boost of the country.

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Nevertheless, despite the immense popularity of Malaysian durians in China, the export volumes to China remain relatively modest. This study, therefore, endeavors to uncover the challenges and barriers that continue to limit Malaysian durian exports to the Chinese market.

2. LITERATURE REVIEW

2.1 Durian Export in Malaysia

Durian cultivation in Malaysia is influenced by a variety of environmental factors, including climate, nutrient levels, moisture content, and soil types. These factors collectively contribute to the increased costs associated with durian cultivation (Siew *et al.*, 2018). Unfavorable weather conditions not only impact durian yields but also affect their overall quality (Hariyono, Ashari, Sulistyono, & Aini, 2013). The availability of durians in both the export and domestic markets depends on durian supply and seasonal considerations (Ahmad, Jamaluddin, Yusof, Safari, & Yusof, 2018). While Malaysia's current durian supply is sufficient to meet both foreign demand, particularly from countries like China, and local demand, the stability of this supply could be compromised in the event of unfavorable conditions.

China, being a major importer of fruits, imported a total of 6.83 million tons of fruit valued at 9.85 billion in 2019, with a 25% increase (Zang, 2020). Due to its large population, China represents a significant consumer market for merchants worldwide (Lei, 2018). The introduction of Malaysian durian to the Chinese market began during the Shanghai World Expo in 2010 when Malaysian durians were showcased to Chinese and other Expo visitors. Consequently, Chinese distributors started importing and promoting Malaysian durians, leading to an increase in their recognition among Chinese consumers. Initially, the export agreement between Malaysia and China covered only frozen durian pulp, with a total export volume of RM9.44 million (Bernama, 2019). However, with the approval for the export of frozen whole durians, Malaysia's exports to China are expected to reach 1,000 metric tons per month, contributing significantly to the country's total export value, estimated at nearly RM500 million (CNA, 2019). The consumption of durian in China has been on the rise, attracting farmers from countries like Malaysia and Thailand to expand their durian plantations, especially in Malaysia, given its close ties with China. This trend prompted the Chinese government to permit more imports of fresh durians from Malaysia. Malaysian durian exporters obtained an export license from China and began exporting fresh Musang King durians to China since August 2019 (Nordin, 2019).

2.3 CHALLENGES FOR MALAYSIA DURIAN EXPORTS TO CHINA

2.3.1 DURIAN SUPPLY

Yaşar and Nelson (2004) conducted a study that revealed a significant relationship between exports and the supply of goods. Their findings highlighted how supply dynamics impact export activities, aligning with the principles of the Heckscher-Ohlin theory, which emphasizes comparative advantages. Kraay's research in China in 1997 further emphasized the importance of efficiency in the export market, particularly noting the role of product and service availability and their productivity in driving export growth. The availability of supply and the productivity of products and services were identified as critical factors that positively influenced exports (Yaşar & Nelson, 2004). Building on these insights, Kravis (1956) emphasized the importance of exporters choosing products and services that can be produced in adequate quantities within their home country. This choice is essential to ensure a stable supply chain that can meet the demands of consumers consistently. Kravis also highlighted the significance of a reliable and consistent supply base for products to ensure that exporters can consistently deliver the goods

and services demanded by consumers (Kravis, 1956). In the context of durian production, the output of durians is notably affected by the climate patterns of the northeast and southwest monsoons (Suntharalingam et al., 2018). Durian trees have specific requirements, including a dry season, for successful flowering and fruit ripening. Typically, durian trees require approximately 2 to 4 weeks of dry weather for flowering and the subsequent ripening of fruit during the wet season. These comprehensions underscore the intricate relationship between supply, productivity, and export success, which holds true for various industries, including durian cultivation. The ability of durian-producing countries like Malaysia to consistently meet demand in export markets such as China relies on factors such as climate suitability, supply chain stability, and productivity in durian production.

2.3.2 LOGISTICS OF DURIAN EXPORT

Stevens (1989) has defined logistics as a system that involves suppliers of materials, executing the production and allocating products and services to consumers. Besides, management of logistics assets with the planning, execution, coordination and monitoring of every stage of business process in the logistic system from manufacturing to deliver to hands to consumer, as well as the effective production and supply of goods and services to meet consumer demand (Vorst, 2007). United Nations (2007) mentioned that logistics can be a major problem especially for those exporters who stayed in remote or rural areas. These exporters with small land plot and in remote areas are often dependent on the middleman and thus incurred unnecessary costs to sell their produce. On the logistics front, numerous intermediaries are involved in Malaysia's durian export supply chain, leading to elevated sales costs for durians (Zakaria & Rahim, 2014). Malaysia's durian export logistics model encompasses five different levels in the supply chain: farmers, wholesalers, retailers, transporters, and consumers (Man, Nawi, & Ismail, 2009). The presence of additional levels in the supply chain introduces delays and increased costs into the export process. Mature Malaysian durians have a limited shelf life, typically lasting only three to four days. The multi-level logistics system employed in Malaysia exacerbates delays, jeopardizes freshness, and often results in wasted durians for exporters. In some cases, expired durians are discarded due to transportation delays (The Straits Times, 2017). Luning (2009) mentioned that logistics issues are one of the most important factors in terms of exporting tropical fruit. The lack of a well-functioning logistics system will result in poor performance of exporting fresh tropical fruit (Wit, 2006). Aramyan, Lansink, Vorst and Kooten (2007) pointed out that perishability, safety issues, freshness as well as quality of durian will be damaged due to inefficiency of supply chain or logistics system. Based on these previous studies, it is mentioned how logistics systems are going to have a strong impact on export of tropical fruit.

2.3.3 THE PREFERENCE OF CHINA CONSUMER

Pollack (2001) concluded that consumer demand for imported fruits is influenced by a multitude of factors, which can be categorized into consumer taste, consumer lifestyle, and cost-related factors, such as pricing. Consumer taste plays a pivotal role in determining the demand for durian. Due to its distinctive and strong sulfur smell, durian is often deemed unacceptable in Western countries. However, in Southeast Asia and much of China, durian enjoys the revered status of being the "King of Fruits." (Striegel et al., 2018). The Monthong durian variety from Thailand has gained popularity as both an "economic crop" (cultivated for profit) and an "export crop" (primarily grown for export) due to its sweetness and its ability to stay fresh for an extended period, approximately 20 days, under suitable conditions without deteriorating. This characteristic has allowed Monthong to capture a significant market share in China. In contrast, Malaysian durian varieties like Musang King, Blackthorn, and D24 can only be stored for 3-4 days.

Beyond this period, their quality and taste are compromised (Suntharalingam et al., 2018). As a result, these Malaysian durian varieties are often sold in the form of frozen durian. Consumers seeking "fresh durian" tend to favor Thailand's Monthong variety. The limited storage time of Malaysian durians has impacted their quality when exported as frozen durian pulp, contributing to Thailand's dominance in the durian export market compared to Malaysia. The quality of durian is a crucial factor for Chinese consumers.

Beyond taste preferences, consumer lifestyle choices can also influence the demand for durian. Chinese consumers who enjoy durian often perceive it as a fruit with high nutritional value. Regular consumption of durian is believed to have health benefits. According to Raffles Health (2019), durian contains essential nutrients such as Vitamin C, which boosts the human immune system and helps reduce the risk of chronic diseases like heart attacks and strokes due to its rich source of monounsaturated fats. Durian's vitamins can also assist in preventing and managing high blood pressure. However, it is advisable not to consume excessive amounts of durian, as it is high in sugar, containing 7-13 grams of sugar per 100 grams, equating to 140-180 calories (GetDoc, 2016).

3. METHODOLOGY

The aim of this study was to gather the subjective insights and opinions of respondents who participated in this research regarding the challenges facing Malaysia's durian export to China. In this study, a qualitative research approach was employed. It facilitates interactions between researchers and respondents, enabling the collection of subjective experiences and rich, meaningful data. Guided interviews were conducted to elicit responses from participants regarding the challenges associated with Malaysia's durian exports to China. The thoughts, views, and experiences of durian exporters were deemed crucial, as they are directly involved in durian export activities. During the data analysis process, the researcher maintained objectivity and refrained from taking sides in the opinions provided by respondents. This approach was adopted to prevent bias and to uphold the study's validity. Consequently, all responses provided by the respondents were transcribed and objectively analyzed in relation to the challenges faced by Malaysia's durian export to China (Creswell, 2003).

4. FINDINGS AND DISCUSSION

4.1 DURIAN SUPPLY ON EXPORTATION TO CHINA

"No, it does not enough to fulfil the demand of durian from China at the moment. But I believe the supply of durian in Malaysia will gradually fulfil the demand because there are a lot of places in Malaysia are starting to plant durian."

Pahang/R2(F)/042021

"Given current situation, especially in China, we did some market research, the supply is unable to fulfil the demand of China consumers toward durians. You can see even for now a lot of businessmen are buying off lands in Malaysia in order for them to start planting durians."

Pahang/R5(M)/062021

“Well durian production in Malaysia is good, but even with our good production, we cannot yet to fulfil the overwhelming demand of durians from China consumers, as I mentioned earlier that the country population is very dense.”

Pahang/R6(M)/072021

Figure 1. Survey statements for the Malaysia Durian supply for China

Based on the responses obtained from the interviews, it is apparent that the demand for durians among Chinese consumers greatly outpaces what Malaysia can produce. One compelling reason, as highlighted by one of the respondents, is the sheer number of durian enthusiasts in China, considering that China boasts one of the world's largest populations. To put this into perspective, China's population stands at 1.4 billion, while Malaysia's population is a mere 32.7 million. If we hypothetically assume that half of China's population, roughly 700 million people, constitutes the target market for Malaysian durians, then each Malaysian would need to produce an average of 21 durians just to meet the demand of these 700 million Chinese durian consumers. Clearly, this scenario is logistically impossible and underscores the significant disparity between demand and supply in the context of durian exports from Malaysia to China.

4.1.1 SEASONALITY

“Raining season is definitely going to influence the supply of durian in Malaysia. However, it depends on the geographical location in Malaysia. For example, if raining season now is in Johor, so the durian supply in Johor is going to be reduced.”

Pahang/R1(M)/042021

“Yeah, raining season is affecting durian supply because durian needs dry season to flower. “

Pahang/R2(F)/042021

“Well definitely, as you know Malaysia got two seasons, hot season and raining season, for raining season it definitely will affects the durian production quality, where it could affect the soil quality and changes the PH of the soil, that indirectly it could actually affect the quality of the flesh of the fruit itself. This can also make the durians drop prematurely.”

Pahang/R5(M)/072021

Figure 2. Survey statements for the Malaysia Durian supply in raining season

The responses from the interviews highlighted the significance of seasonality as a critical factor influencing durian production in Malaysia. Durian trees thrive in drier and hotter seasons, as they require ample sunlight for optimal growth. These trees have robust root systems that can store sufficient water to sustain them for several days, making them resilient in dry conditions. It is only under these favorable conditions that durian trees bear an abundant fruit harvest, which, according to respondents, could increase durian supply in Malaysia. Furthermore, in alignment with the Heckscher-Ohlin theory, seasonality emerges as a key reason for international demand for durians from China. China, with its four distinct seasons, is not conducive to durian cultivation, unlike tropical countries such as Thailand, Malaysia, and Indonesia. This difference in endowment factors between China and durian-producing nations leads to an international demand for durians.

The consensus from the interviews emphasizes that rainy seasons in Malaysia significantly impact durian production and quality. Malaysia experiences two durian production seasons annually, in June and December. During rainy seasons, particularly in regions like Pahang, the number of durian flowers produced by trees decreases, affecting fruit yield. Durian flowers typically take two to four weeks to blossom during dry seasons, and factors like self-incompatibility and rainy season duration can impact fruit set and yield. To address these challenges, Malaysian farmers should monitor monsoon seasons and take preventive measures to protect durian trees from excessive rain, as Malaysia is prone to flooding. Planting durian trees at higher altitudes can also reduce the risk of flooding and ensure consistent fruit production.

4.1.2 LIMITED LAND AVAILABILITY

“Yes, limited resources like land are going to affect the supply of durian. Also, durian that is planted at higher latitude comes with higher price because technique to plant and harvest durian are harder than usual.”

Pahang/R1(M)/042021

“Resources like land does affect the supply of durian, because now the major plantation of durian in Malaysia is in Pahang, other states are just starting to plant durians.”

Pahang/R2(F)/042021

“Yes, hence when we plant durian, mostly we can see the durians planted in Karat and West Malaysia are usually planted on a higher altitude. The reason why because the durians planted on high altitude the quality would be better.”

Pahang/R5(M)/072021

Figure 3. Survey statements for the Malaysia Durian supply due to limited land availability

The interviews revealed unanimous agreement among respondents that rainy seasons indeed have a significant impact on durian supply in Malaysia. Durian trees necessitate a dry environment for successful blossoming, which, in turn, leads to fruit-bearing. However, when it comes to the constraint of land availability, opinions were divided on its effects on durian supply in Malaysia.

Some respondents emphasized that the majority of durian cultivation takes place in Pahang. Consequently, they argued that no matter how much additional land becomes available, it would not substantially affect durian supply. This viewpoint was grounded in Pahang's reputation for higher land altitudes and superior soil quality, which are highly favorable conditions for durian cultivation.

Conversely, other respondents held a different perspective. They suggested that expanding the land available for durian plantation in Malaysia could boost durian supply. Their belief was that with more land dedicated to durian cultivation, Malaysia could increase its overall durian production. This divergence of opinion highlights the complexity of the issue and underscores the various factors at play in the durian supply chain in Malaysia.

The suitability of land for durian cultivation in Malaysia involves a complex interplay of factors. While expanding the available land for durian plantations may seem like a solution, not all land is conducive to durian growth. Durian trees have specific requirements, including altitude, temperature, and soil quality. They thrive in cooler temperatures, prompting many farmers to plant them at higher altitudes to optimize growth. Moreover, lowlands pose a flood risk, which can damage durian trees. Pahang, with its higher altitudes and nutrient-rich soil, has become a

hub for durian cultivation, meeting these specific requirements. Therefore, limited land availability does indeed constrain durian production, as durian trees necessitate suitable lands that meet specific conditions for optimal growth.

4.2 LOGISTICS

“The logistic is quite difficult as you know durian is a very thorny fruit. Some customers enjoy the process of opening durians, buying the whole fruits, so sometimes we will export the durian together with the thorns and everything. So sometimes we will also hire people to open durians, remove the flesh and freeze it, and the process is pretty difficult, plus durian is also a very heavy fruit. So sometimes when you have packed the durians in the box, it will break the boxes, so you need to make sure to use a thicker box and everything.”

Pahang/R3(M)/062021

“I think the exportation of the durians themselves are quite tedious because we have to freeze the whole fruit using liquid nitrogen and then we need to package it properly because the fruit itself is very thorny and very heavy so it will be more troublesome to export the whole fruit itself.”

Pahang/R4(M)/062021

Figure 4. Survey statements for the Malaysia Durian supply due to logistics

As per the responses provided, the primary challenges in the logistics of durian exportation to China are primarily attributed to the unique nature of the fruit itself. Respondents emphasized that once durians are harvested, immediate freezing is essential to preserve the freshness of the flesh. Additionally, the physical characteristics of the durian, including its weight and thorny exterior, compound the logistical difficulties. These characteristics, particularly during the packaging process, demand additional labor and time investments, contributing to logistical challenges.

Logistical issues become more apparent when the top priority is maintaining the freshness of the durians. If exporters opt for sea transport, concerns arise regarding the preservation of fruit freshness and quality during the extended shipping duration, which can span several days or even weeks. Furthermore, utilizing thicker boxes or crates to safeguard the durians during transportation adds to the overall costs. Additionally, the use of nitrogen as a freezing agent to maintain freshness further escalates expenses. Consequently, the prevailing perspective on durian exportation is that it is a labor-intensive and costly process, primarily due to the imperative need to keep the durians fresh. This translates to additional financial burdens for durian exporters. It's worth noting that the logistics of durian exportation involve various intricate challenges, including temperature control, handling the durian's unique characteristics, and the need for specialized freezing methods to ensure quality upon arrival. These complexities add to the overall cost and logistical intricacies of exporting this highly sought-after fruit to China.

4.2.1 LOGISTICS AFFECTS THE EXPORTATION OF DURIANS TO CHINA

“One of the main logistic problems that we are trying to figure out, is how to maintain the quality and the freshness of the durians when we export, so, what we have actually been doing is that we try to use liquid nitrogen to freeze the durians and also to send it frozen, but that also affects the quality, plus the delivery costs a lot as we need to cargo it, so we are trying to figure out how to export durians while maintaining the quality and the freshness.”

Pahang/R3(M)/062021

"For logistics is not that many, just that sometimes that the logistics in Malaysia needs to be punctual, as the durian needs to be kept fresh while delivering to China. If the time is delayed, then the quality of the durian will be affected."

Pahang/R4(M)/062021

"Depend on the exportation and logistic fees, if the demand from the China side is high then definitely it would be enough to cover the expensive logistic cost of transporting the durians."

Pahang/R5(M)/072021

Figure 5. Survey Statements for the Malaysia Durian supply for logistics problems

The respondents highlighted two significant factors in the logistics of durian exportation to China. Firstly, transportation costs played a pivotal role in affecting the export volume of durians. The high expenses associated with delivering these heavy fruits from the plantation to the processing facility limited the quantity of durians available for export. With restricted volumes reaching the factory, the overall number of durians available for export to China was inevitably impacted.

Secondly, timeliness emerged as a critical element in durian exportation logistics. The preservation of freshness is paramount due to the relatively short shelf life of ripe durians. Respondents stressed the importance of promptly freezing the durians upon arrival at the processing facility to maintain their quality. Any delay in this process could result in durians exceeding their shelf life, rendering them unsuitable for export. This adherence to strict timelines is vital to ensure that only fresh, high-quality durians are exported to China.

The logistics of durian exportation encompass a series of processes, including harvesting, post-harvest processing, freezing, packaging, and transportation. It's crucial to maintain the cold chain throughout these steps to preserve the freshness of the durians. The entire journey, from the farm to the port of discharge, can take approximately twelve days, involving various inspections and approvals from customs and port authorities. Sea freight from Malaysia to southern China takes an additional ten to eleven days, followed by clearance and distribution within China. This comprehensive process underscores the intricate and time-sensitive nature of durian logistics, which demands precision to ensure the delivery of high-quality, fresh durians to the Chinese market.

4.3 CHINA CONSUMER PREFERENCES

"Most China people will mostly favor Malaysia Musang King because of the strong flavor. "

Pahang/R4(M)/062021

"For this we refer to the global market to decide, but if you look at a lot of newspaper, a lot of Hong Kong artist and China artist as well, they will choose to eat Malaysia's durians because the flavor of Malaysia's durians is no doubt better as compared to Thailand's durians. Especially our local Musang King and D24 are one of the tops picked by oversea people, not to mention Blackthorn. "

Pahang/R5(M)/072021

“The most famous one in China market is Thailand durian because of the cheaper price for Thailand durian as compared to Malaysia durian and Thai durian is freshly export to China, so consumers more prefer to Thai durians.”

Pahang/R2(F)/042021

Figure 6. Survey Statements for the China consumer preference on Malaysia Durian

Based on the above responses, due to the better and stronger flavor of Malaysia durians, most China would opt for Malaysia durians than Thailand durians. This is because Malaysia's premium durian, Musang King and Blackthorn are always marketed as the durian with superior flavor, thicker flesh, and bright yellow color. Despite the added cost, Malaysia's premium durian have better overall quality than their competitors. However, some respondents defend Thailand durians where more China consumer would prefer to go with the country's durians due to the cheaper price of the fruits as compared to Malaysia durians

In Malaysia, increased consumption has much to do with the change in China consumer preferences towards durian, on how it has already evolved over these past few years. The popularity of this fruit can be seen from a study in the mid-2000s, where it indicated that sixty-three percent of China consumers will return to the place where they had durian before, for visits do so to consume durian (Abu Dardak, 2006). A host of durian orchards in the countryside and near cities have opened their doors to guests so they are able to taste the fruit at its most authentic or local location. Durian festivals and competitions sponsored in part by the Malaysian agricultural departments have proliferated to boost small-scale agriculture. Companies and local politicians periodically arrange durian degustation parties for their employees and constituents, respectively, again to promote Malaysia durian.

4.4 IDENTIFYING NEW CHALLENGES

4.4.1 QUALITY CONTROL OF DURIAN

“I would say the quality of durians are really a challenge to the exporting of durian to China.”

Pahang/R2(F)/042021

“The quality of the fruits, because sometimes once we finish exporting and everything, the durian goes over there (China) they lose their taste, their smell and everything.”

Pahang/R3(M)/062021

Figure 7. Survey Statements for quality control on Malaysia Durian

Exporters consistently pointed to the challenge of maintaining the quality of durians, primarily due to their short shelf life. To preserve the fruit's quality before exportation, the freezing process is a mandatory step for Malaysian exporters. Although Malaysia has honed its freezing techniques using cryogenic freezing, this doesn't align well with China's limited cold chain infrastructure outside major cities. A robust cold chain infrastructure, encompassing refrigerated warehouses, transportation, and equipment, is essential to ensure the quality of the frozen durians during their journey. However, China's underdeveloped cold chain infrastructure in rural areas poses a significant hurdle.

Cold logistics via air freight from Malaysia to China has been an option, reducing delivery time, but refrigerated freight transportation remains the more practical and economical choice. Recognizing the importance of food safety and quality, China has initiated plans to develop cold chain infrastructure by 2020. This development is crucial for preserving durian quality, extending shelf life, and preventing fruit deterioration. Aligning with the Global Strategic Rivalry Theory, Malaysia's use of these methods to maintain durian quality can be seen as a strategic move to uphold its competitive position in the industry. Failing to do so could lead to compromised durian quality, rejection by importing countries, and a detrimental impact on export rates.

4.4.2 PEST AND DISEASES CONTROL

"Well just now I mentioned about the pest and disease earlier right, so rather than other challenges, I will focus on that because pest and diseases are something that we cannot actually control and with limited land this could actually affect the entire durian exportation system."

Pahang/R6(M)/072021

Figure 8. Survey Statements for the Malaysia Durian pest and disease control

Durian trees, like other plants, are susceptible to pests and diseases. Without effective pest and disease management, these issues can limit the quantity of durians a tree can produce, leading to a decrease in the exportable supply to China. A study by Datepume and colleagues (2019) demonstrated that severe pest infestations negatively impacted farmers' ability to produce durians for export. This damage resulted from improper cultivation practices and inadequate pest management, affecting both the quality and quantity of durian production. Farmers must prioritize proper farm management practices, following recommendations from agricultural experts and adhering to Good Agricultural Practices (GAP) standards. This approach will help maintain the quality and safety of durian products and contribute to a more stable export supply.

5. CONCLUSION

The study conducted an in-depth exploration of the challenges confronting the Malaysian durian exportation industry, based on insights shared by Malaysian durian exporters. Respondents shed light on the intricate relationship between land availability and its impact on the supply of durian in Malaysia. A consensus emerged that not all available land is suitable for durian cultivation. Furthermore, the importance of soil quality as a limiting factor in durian production cannot be overstated. Soil texture, moisture retention, and nutrient content were identified as critical factors influencing the success of durian trees. Concerning the logistical aspects of durian export within Malaysia, Durians undergo multiple stages of processing, spanning from the collection of the fruits to their final packaging, before they can be readied for export. Any disruption in these critical processes can result in export delays to China. Chinese consumers tend to favor the consumption of fresh, unaltered durians over manufactured durian products. This consumer preference is driven by factors like taste and the pricing of fresh durians compared to factory-produced durian items. In addition to the challenges discussed above, the study aimed to identify other hurdles that could influence the durian exportation rate in Malaysia. Surprisingly, the respondents highlighted issues such as the challenge of maintaining durian quality and freshness as well as complexities related to pest and disease control in durian orchards. The analysis underscores that the quality of durians is intricately tied to processes that safeguard fruit freshness, including rigorous adherence to proper harvesting, selection, transportation, trimming, and freezing protocols. Quality is closely intertwined with the exportation rate, as subpar-quality durians are disqualified and cannot be exported to China. Respondents underscored the significant challenges presented by pests and diseases that afflict durian trees.

Insufficient control of these issues can lead to a decline in durian supply, indirectly affecting exportation by causing a reduction in export volumes. To reiterate, this study aimed to provide sufficient insights and awareness to the authorities on the factors that could affect Malaysia durian exportation business in exporting durian to China. Since this study is only focused on Pahang state as the location where most exporters export durians to China, future research can consider taking in a larger sample size, not just restricting to only one area, instead future research can cover the whole Malaysia. Researchers can explore similar studies, but their scope need not be limited to China. Researchers could also complement qualitative studies with quantitative research methods to provide deeper analytical insights into this topic. This multifaceted approach will contribute to a more comprehensive understanding of the challenges and opportunities in the global durian export market.

REFERENCES

- [1] Abu Dardak, R. (2006). The Consumers' Preference for Durian in Malaysia. *Economic and Technology Management Review*, 1(1), 37-49.
- [2] Aguiar, A., Chepeliev, M., Corong, E., McDougall, R., & Van Der Mensbrugge, D. (2019). The GTAP Data Base: Version 10. *Journal of Global Economic Analysis*, 4(1), 1-27. doi:<http://dx.doi.org/10.21642/JGEA.040101AF>
- [3] Ahmad, A. A., Jamaluddin, J. A., Yusof, F., Safari, S., & Yusof, R. M. (2018). Maximising the Benefit of Domestic and Export Markets Scenario: Predicting Models for Durian Production. *Economic and Technology Management Review*, 13, 19-31.
- [4] Ahmad, A. A., Yusof, F., Mispan, M. R., Rasid, M. Z., & Nizar, M. M. (2020). Durian Yield Trends and Distribution Patterns in Peninsular. *Pertanika Tropical Agriculture Science*, 43(1), 47-64.
- [5] Aramyan, L. H., Lansink, A. G., Vorst, J. G., & Kooten, O. v. (2007). Performance Measurement In Agri-food Supply Chains: A Case Study. *Supply Chain Management*, 304-315.
- [6] Aziz, N. A., & Jalil, A. M. (2019). Bioactive Compounds, Nutritional Value, and Potential Health Benefits of Indigeous Durian (Durian Zibethinus Murr): A Review. *A Review. Food*, 8(96). doi:<https://doi.org/10.3390/foods8030096>
- [7] Barnier, B. (2020, March 27). *Law of Demand*. Retrieved from Investopedia: <https://www.investopedia.com/terms/l/lawofdemand.asp#:~:text=The%20law%20of%20demand%20states,the%20lower%20the%20quantity%20demanded>.
- [8] Bayhaqi, A., Andres, E. A., Cheok, D., & Asi, R. L. (2017). *Study on the Application of Global Data Standards for Supply Chain Connectivity (Phase 2)*. Australia: APEC Secretariat, APEC Policy Support Unit.
- [9] Bekele, D. (2018). Review on Factors Affecting Postharvest Quality of Fruits. *Journal of Plant Science and Research*, 5(2), 180.
- [10] Bowie, N. (2018, January 26). *Low Hanging Fruit for China-Malaysia Ties*. Retrieved from Asia Times: <https://asiatimes.com/2018/01/low-hanging-fruit-china-malaysia-ties/>
- [11] Cabi. (2019, November 20). *Cabi*. Retrieved from Durio zibethinus: <https://www.cabi.org/isc/datasheet/20179>
- [12] Cai, F. (2019, May 14). *Malaysian Durian Reach Important Turning Point In Export to Chinese Market*. Retrieved from Fresh Plaza: <https://www.freshplaza.com/article/9103546/malaysian-durian-reach-important-turning-point-in-export-to-chinese-market/>
- [13] Carnarius, J. (2018, March 20). *Modes of Transportation Explained: Which Type of Cargo and Freight Transportation Is The Best?* Retrieved from Forto: <https://forto.com/en/blog/modes-transportation-explained-best/>
- [14] Caulfield, J. (2019). *How to Do Thematic Analysis*. Retrieved from Scribbr: <https://www.scribbr.com/methodology/thematic-analysis/>

- [15] Chow, E. (2018, November 26). *Malaysia Bets on Durian as China Goes Bananas for World's Smelliest Fruit*. Retrieved from Reuters: <https://www.reuters.com/article/uk-malaysia-durian-idUKKCN1NV025>
- [16] Chung, F. (2019). *Durian Seasons in Durian Production Areas*. Retrieved from Durian Info: <http://durianinfo.blogspot.com/p/durian-seasons-in-durian-production.html>
- [17] Chung, P. (2019, October 1). *Overview of Malaysian Durian Production, Export, and Price*. Retrieved from Tridge: <https://www.tridge.com/stories/overview-of-malaysian-durian-production-export-and-price>
- [18] CNA. (2019, June 17). *Malaysia Expects Frozen Durian Exports to China to Hit 1,000 Metric Tonnes Monthly*. Retrieved from CNA: <https://www.channelnewsasia.com/news/business/malaysia-frozen-durian-exports-to-china-1-000-metric-tonnes-11634750>
- [19] Datepume, N., Sukprasert, P., Jatuporn, C., & Thongkaew, S. (2019, August). Factors Affecting the Production of Export Quality Durians by Farmers in Chanthaburi Province, Thailand. *Journal of Sustainability Science and Management*, 14(4), 94-105. Retrieved from <https://jssm.umt.edu.my/wp-content/uploads/sites/51/2019/08/9.pdf>
- [20] Department of Agriculture Malaysia. (n.d.). *Varieties Registered For National Crop List*. Retrieved from Department of Agriculture Malaysia: <http://pvpbkkt.doa.gov.my/NationalList/Search.php>
- [21] Durian Asia Manajamen. (2017). *Durian Global Market Report*. Retrieved from Durian Asia Manajamen: <http://ptdurian.com/pdf/DurianGlobalMarketReport.pdf>
- [22] Fang, C. (2020, June 11). *Malaysian Durian Export to China this Season Promising*. Retrieved from Fresh Plaza: <https://www.freshplaza.com/article/9224293/malaysian-durian-export-to-china-this-season-promising/>
- [23] Federal Agricultural Marketing Authority. (2020). *Panduan Pengeksportan Durian Sejuk Beku ke China*. Retrieved from Federal Agricultural Marketing Authority: <http://www.fama.gov.my/en/pengeksportan-isi-durian-sejuk-beku-ke-china>
- [24] GetDoc. (2016, June 20). *Is Durian Bad for Your Health? 6 Facts You Need to Know!* Retrieved from GetDoc: <https://www.getdoc.com/durian-bad-health/>
- [25] Ketsa, S., Wisutiamonkul, A., Palapol, Y., & Paull, R. (2020). The Durian: Botany, Horticulture, and Utilization. In I. Warrington (Ed.), *Horticultural Reviews* (Vol. 47, pp. 125-211). John Wiley & Sons, Inc. doi:<https://doi.org/10.1002/9781119625407.ch4>
- [26] Khor, Y.-L. (2019, May 6). *As Malaysia Ramps Up its Durian Exports to China, Quirky Product Offerings May Be Answer to Rivalling Thailand's Dominance*. Retrieved from The Week in Asia: <https://www.scmp.com/week-asia/opinion/article/3008935/malaysia-ramps-its-durian-exports-china-quirky-product-offerings>
- [27] Kopp, C. M. (2020, August 22). *Heckscher-Ohlin Model*. Retrieved from Investopedia: <https://www.investopedia.com/terms/h/heckscherohlin-model.asp>
- [28] Kubo, K., & Sakata, S. (2018). Impact of China's Increasing Demand for Agro Produce on Agricultural Production in the Mekong Region. *BRC Research Report Bangkok Research Center, JETRO Bangkok/IDE-JETRO*.
- [29] Lei, L. (2018). A General Review of China's Fruit Import Status. *IDE Discussion Paper*, 726.
- [30] Luning, P. (2009). *Food Quality Management: Technological and Managerial Principles and Practices*. The Netherlands: Academic Publishers.
- [31] Macmillan Dictionary. (2017, January 22). *Challenge*. Retrieved from Macmillan Dictionary: https://www.macmillandictionary.com/dictionary/british/challenge_1
- Man, N., Nawi, N. M., & Ismail, M. (2009). An Overview of the Supply Chain Management of Malaysian Vegetable and Fruit Industries Focusing on the Channel of Distribution. *Journal of Agribusiness Marketing*, 2, 1-18.

- [32] Mokhzani, C. W. (2017, May 13). *King of Fruit*. Retrieved from The Star: <https://www.thestar.com.my/business/business-news/2017/05/13/the-china-factor-in-durian-prices/>
- [33] Mukherjee, S. (2007). *Heckscher-Ohlin's Theory of International Trade*. Retrieved from EconomicDiscuss: <https://www.economicdiscussion.net/heckscher-ohlins-theory/heckscher-ohlins-theory-of-international-trade/10697>
- [34] Mun Meng Group. (2020). *Frozen Whole Durian*. Retrieved from Mun Meng Group: <https://munmenggroup.com/product/frozen-whole-durian/?lang=en>
- [35] Mun Meng Group. (2021). *Durian Pulp*. Retrieved from Mun Meng Group: <https://munmenggroup.com/product/durian-pulp/?lang=en>
- [36] Nirav, S. (2019). *How to Grow Durian*. Retrieved from Durian Haven: <http://durianhaven.com/how-to-grow-durian.html>
- [37] Noodaeng, S. (2017). Export Competitiveness of Thai Durian in China Market. *European Journal of Business and Management*, 9(36), 48-55.
- [38] Nordin, R. (2019, June 1). *Malaysia to Start Exporting Musang King to China in August*. Retrieved from The Star: <https://www.thestar.com.my/news/nation/2019/06/01/msia-to-start-exporting-musang-king-to-china-in-august>
- [39] Ong, C. (2019, August 7). *12 Types of Durians and How to Pick the Best Durian*. Retrieved from YouTrip: <https://www.you.co.sg/blog/types-of-durians-how-to-pick-the-best-durian/>
- [40] PMA China Market Development Representative. (2016). *Exporting Fresh Fruit and Vegetables to China: A Market Overview and Guide for Foreign Suppliers*. Delaware: Produce Marketing Association.
- [41] Pongpanich, C., & Phitya-Isarakul, P. (2008). Enhancing the Competitiveness of Thai Fruit Exports: An Empirical Study in China. *Contemporary Management Research*, 4(1), 15-28.
- [42] Ravindran, V. (2019). Data Analysis in Qualitative Research. *Indian Journal of Continuing Nursing Education*, 20(1), 40-45.
- [43] Romero, M. A. (2011). *Costa Rican Export Chain of Fresh Fruits to Europe*. Wageningen University and Research Centre.
- [44] Rosli, L. (2019, April 29). *FGV to Plant Up 1,400ha with Durian for Exports*. Retrieved from New Straits Time: <https://www.nst.com.my/business/2019/04/484050/fgv-plant-1400ha-durian-exports>
- [45] Rozana, N., N. M. M., S., & Othman, M. F. (2017). Competitiveness of Malaysia's Fruits in the Global Market: Revealed Comparative Advantage Analysis. *Malaysian Journal of Mathematical Sciences*, 11, 143-157.
- [46] Ruamngow, S. (2000). *Control of Postharvest Fruit Rot of Durian Caused by Colletortichum Gloeosporioides, Lasiodiplodiatheobromae and Phomopsis sp.*M.S. Thesis. Bangkok: Kasetsart University.
- [47] Ruben, R., Tilburg, A. v., Trienekens, J., & Boekel, M. v. (2007). *Linking Market Integration, Supply Chain Governance, Quality and Value Added in Tropical Food Chains*. Netherlands: Wegenigen Academic Publisher.
- [48] S, T. (2016). *Advantages And Challenges Of Exporting*. Retrieved from Expertbase logo: <https://www.expertbase.org/a238-advantages-and-challenges-of-exporting>
- [49] Segal, T. (2020). *Export Definition*. Retrieved from Investopedia: <https://www.investopedia.com/terms/e/export.asp>
- [50] Sharma, D. B. (2018). Processing of Data and Analysis. *Biostatistics and Epidemiology International Journal*, 1(1), 3-5. doi:10.30881/beij.00003
- [51] Sidhu, B. (2019, December 21). *Durian and the Scent of Money*. Retrieved from The Star: <https://www.thestar.com.my/business/business-news/2019/12/21/durian-and-the-scent-of-money>

- [52] Siew, G. Y., Ng, W. L., Tan, S. W., Alitheen, N. B., Tan, S. G., & Yeap, S. K. (2018). Genetic Variation and DNA Fingerprinting of Durian Types in Malaysia Using Simple Sequence Repeat (SSR) Markers. *PeerJ*, 6, 1-18. doi:10.7717/peerj.4266
- [53] Statista. (2020, December 18). *Production Volume of Durians in Malaysia From 2013 to 2019*. Retrieved from Statista: <https://www.statista.com/statistics/1000876/malaysia-durian-production/#:~:text=In%202019%2C%20Malaysia%20produced%20approximately,shell%20and%20strong%2C%20pungent%20smell.>
- [54] StatsDirect. (2020, December 25). *P Values*. Retrieved from StatsDirect: https://www.statsdirect.com/help/Default.htm#basics/p_values.htm
- [55] Striegel, L., Chebib, S., Dumler, C., Lu, Y., Huang, D., & Rychlik, M. (2018, November 28). *Durian Fruits Discovered as Superior Folate Sources*. Retrieved from US National Library of Medicine National Institute of Health: [https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6279852/#:~:text=The%20durian%20chips%20\(1%E2%80%933,lower%20compared%20with%20fresh%20arils.](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6279852/#:~:text=The%20durian%20chips%20(1%E2%80%933,lower%20compared%20with%20fresh%20arils.)
- [56] Subhadrabandhu, S., & Ketsa, S. (2001). *Durian: King of Tropical Fruit*. Madison, Wisconsin: D. Brasell. doi:http://dx.doi.org/10.1079/9780851994963.0000
- [57] Suntharalingam, C. (2017). Competitiveness of Malaysia's Fruits in the Global Market: Revealed Comparative Advantage Analysis. *Malaysian Journal of Mathematical Sciences* 11, 143-157.
- [58] Suntharalingam, C., Ahmad, T. A., Ali, A. K., & Rusli, R. (2017). Competitiveness Of Malaysia's Fruits in The Global Agricultural And Selected Export Markets: Analyses Of Revealed Comparative Advantage (RCA) And Comparative Export Performance (CEP). *Economic and Technology Management Research Centre*, 6, 1-17.
- [59] Suntharalingam, C., Jamaludin, J. A., Athirah, N. F., Mustafa, R., & Safari, S. (2018, October 15). *Durian as New Source of Malaysia's Agricultural Wealth*. Retrieved from Food and Fertilizer Technology for the Asian and Pacific Region.
- [60] Tantrakonnsab, W., & Tantrakoonsab, N. (2018). Thai Export of Durian to China. *BRC Research Report Bangkok Research Center, JETRO Bangkok*.
- [61] The Business Times. (2019, August 9). *Malaysia's Durian Exporters See Spike In Demand From China*. Retrieved from The Business Times: <https://www.businesstimes.com.sg/asean-business/malaysia%E2%80%99s-durian-exporters-see-spike-in-demand-from-china>
- [62] The Straits Times. (2017, November 30). *Malaysia Seeks to Satisfy China's Durian Craving*. Retrieved from The Straits Time: <https://www.straitstimes.com/asia/se-asia/malaysia-seeks-to-satisfy-chinas-durian-craving>
- [63] Trienekens, J., & Willems, S. (2007). Innovation and Governance in International Food Supply Chains The Cases of Ghanaian Pineapples and South African Grapes. *International Food and Agribusiness Management Review*, 10(4), 42-63.
- [64] Tropical Fruit Global Information. (2020). *Durian Harvesting*. Retrieved from Tropical Fruit Global Information: <http://www.itfnet.org/gfruit/Templates%20English/durian.harvest.htm>
- [65] United Nations. (2007). *Challenges and Opportunities Arising from Private Standards on Food Safety and Environment for Exporters of Fresh Fruit and Vegetables in Asia: Experiences of Malaysia, Thailand, and Vietnam*. New York: United Nations.
- [66] Wan Ibrahim, W., Safari, S., Abdul Rahim, M., & Razali, N. (2021). From Farm to China: A Case Study of Malaysian Frozen Whole Durian Export Supply Chain. *Economic and Technology Management Review*, 16, 1-20.
- [67] Wang, H. (2020, August 27). *Thai Durian are Expected to Perform Poorly in the Chinese Market, at Least for a Short While*. Retrieved from Fresh Plaza: <https://www.freshplaza.com/article/9244103/thai-durian-are-expected-to-perform-poorly-in-the-chinese-market-at-least-for-a-short-while/>
- [68] Weedmark, D. (2018, June 11). *Definition of Consumer Preference*. Retrieved from Biz Fluent: <https://bizfluent.com/info-8698883-definition-consumer-preference.html>

- [69] Wit, A. d. (2006). *Brazilian Cut Flower Export Chains to Europe – Management Recommendations for the Northeastern State of Ceará*. Wageningen University.
- [70] Wong, K. (2017, November 29). *Malaysia Durians are the Next Big Thing in China's Billion-dollar Market for the "King of Fruits"*. Retrieved from Mothership: <https://mothership.sg/2017/11/malaysia-durians-china-billion-dollar-market-king-of-fruits/>
- [71] Wulandari, D., Qurniati, R., & Herwanti, S. (2018). Durian Marketing Efficiency in Durian Tourism Village in Sumber Agung. *Jurnal Sylva Lestari*, 6(2), 68.
- [72] Xia, B. S., & Gong, P. (2014). Review of Business Intelligence Through Data Analysis. *Benchmarking: An International Journal*, 21(2).
- [73] Yaşar, M., & Nelson, C. H. (2004). The Relationship between Exports and Productivity at the Plant level in the Turkish Apparel and Motor Vehicle Parts Industries. *Mahmut Yaşar Carl H. Nelson*.
- [74] Yusof, A. (2020, February 07). *Malaysia's Durian Industry Stung by Low Prices as Coronavirus Outbreak Affects Demand from China*. Retrieved from CNA: <https://www.channelnewsasia.com/news/asia/malaysia-wuhan-coronavirus-durian-china-demand-musang-king-12404526>
- [75] Zakaria, A., & Rahim, A. R. (2014). An Overview of Fruit Supply Chain in Malaysia. *Jurnal Mekanikal*, 37, 36-46.
- [76] Zang, J. (2020, February 23). *China's Fruit Import and Export Statistics for 2019 Released*. Retrieved from Produce Report: <https://www.producereport.com/article/chinas-fruit-import-export-statistics-2019-released#:~:text=Recently%20released%20data%20from%20the,%25%20and%2025%25%2C%20respectively.>