

Durian

Global Market Report



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Introduction

This report quantifies the size of the Durian market in terms of volume and value for Durian fresh fruit and related by-products by analysing recorded levels of world trade. Further, the report intends to estimate supply levels needed to sustain current and future requirements of Durian, specifically for the Musang King variety.

The analysis indicates that the retail value of Durian consumed globally in fresh fruit form reached 15 USD billion in 2016. The total value of the entire Durian market however is significantly higher if one takes into account Durian end products. Durian end products include the market segments of desserts, snacks and beverages. Durian's share of these markets is unknown but combined in Asia are worth over 275 USD billion annually and growing. Additionally, the analysis reveals the necessity for more plantations in order to supply the growing needs of the global market, particularly from China.

Although a variety of data sources have been utilised in this report, the two primary sources of data for world trade come from UN Comtrade, published by the United Nations Statistics Division and Trade Map, a subsidiary organisation of the World Trade Organization (WTO).



UN Comtrade – Explained



UN Comtrade is the pseudonym for United Nations International Trade Statistics Database. Over 170 reporting countries/areas provide the United Nations Statistics Division (UNSD) with their annual international trade statistics data detailed by commodities/service categories and partner countries. This data is subsequently transformed into the UNSD standard format with consistent coding and valuation using their processing system. UN Comtrade is the largest depository of international trade data, containing well over 3 billion data records since 1962.

Data is categorized by a 'Harmonized System' of codes known as HS Codes. This is a standardised numbering system for classifying imported and exported products. HS Codes are used globally by countries as a basis for recording customs tariffs, quota controls, place of origin, and trade policy. The base system uses a 6 digit number (HS Code), with countries allowed to add up to an additional 4 digits for deeper product classification. In essence, the longer the code, the more detailed the product description.

The HS Code applicable to Durian fruit is 081060 (Fruit, edible; durians, fresh). This code records global trade solely in fruit form.

Trade Map – Explained



Trade Map is a trade statistics data portal developed by the International Trade Centre (ITC), (a subsidiary of the World Trade Organization (WTO)) and the United Nations Conference on Trade and Development (UNCTAD). Like UN Comtrade, it categorizes data based on HS Codes, with Durian fruit trade tracked by the HD Code 081060.

Trade Map is similar to UN Comtrade, and in fact uses UN Comtrade data as a key source for its own data however it does have a noteworthy difference. Trade Map also contains additional data for countries that do not report their national trade statistics to UN Comtrade. The trade of unreported countries is reconstructed by Trade Map on the basis of data reported by partner countries and is called mirror data. This Trade Map feature at times can provide a more thorough and complete picture of world trade relative to the figures UN Comtrade provides.



Research Data Observations

The following are key observations and/or issues that came to light when collating data and compiling this report:

- Reported trade data does not take into account different varieties of Durian instead combining them all together. Additionally, reported import and export trade values are believed to be undervalued due to importers and exporters likely under declaring value. This report takes the retail value of Durian fruit into account.
- Data reported by UN Comtrade and Trade Map are almost identical with the only key noticeable difference being reported trade from Vietnam. UN Comtrade reports no import and export data in 2016, while Trade Map reports imports of 84.88 million KG and exports of 407 thousands KG. This report takes Vietnam's Trade Map trade data into account.
- Indonesian trade data sourced from Statistics Indonesia known as Badan Pusat Statistik, the countries statistical agency, is significantly different than data reported by Trade Map and UN Comtrade. For example, Trade Map and UN Comtrade report no exports in 2015 and yet Statistics Indonesia reports 410 million KG. This report takes 2015 Statistics Indonesia data into account purely for domestic consumption and production purposes. Trade Map's 2016 Indonesian exports are utilized for global trade calculations since Statistics Indonesia does not report their export's destination countries. Including their exports without knowing their end destination would create a global trade imbalance.
- Vietnam in 2016 appeared as a key Durian importer for the first time. Although experts believe that up to 85% of their imports are re-exported to China, trade statistics state otherwise. The values contained in this report are based solely on official Trade Map statistics rather than unsubstantiated claims.
- Hong Kong in 2016 reportedly imported 318.80 million KG of Durian yet exported 301.80 million KG – the majority of which likely went to China. Hong Kong is a known re-export trade hub throughout the region and this data has confirmed this. As a result, imports for Hong Kong in this report refer to net import data rather than gross, to represent trade more accurately.
- China is believed to be the destination for the majority of Hong Kong's re-exports of Durian however it is not known if these are fully considered in China's import figures. If they are not taken into account this may mean China may have imported up to 620 million KG in 2016. This figure is based on adding HK re-exports to Chinese imports. In addition, Hong Kong although an autonomous territory is a Special Administrative Region of China, with trade between the countries unreported in some cases.
- Actual trade in China is likely significantly higher than reported by Trade Map and UN Comtrade due to illegal and unreported trade. For example, China at the moment does not allow fresh whole Durian fruit imports from Malaysia although they are known to be sold in China. Additionally, Statistics Indonesia reports a large volume of exports which are likely destined to China but are not reported by Trade Map and UN Comtrade. This implies that there is some level of unreported trade occurring although the figure is unknown. This report does not take this into account.

Hong Kong Data Further Explained

Imports for Hong Kong are based on net imports rather than imports, in order to more accurately represent trade. Hong Kong is a known re-exporter primarily to China and utilising their import figures would distort and misrepresent the entire market. According to Trade Map, Hong Kong imported 318.80 million KG of Durian, which would make it the world's largest importer. However, Trade Map also indicates Hong Kong exported 301.80 million KG of Durian. These figures indicate that Hong Kong is re-exporting the majority of Durian, most likely to China.

Furthermore, consumption per capita was analysed and compared regionally to test and re-confirm the rationale that Hong Kong's imports distort market data. Trade Map imports indicate a consumption of 43 KG per capita which is unrealistic, as Malaysia is known to be the largest consumer of Durian and has a per capita consumption of 11 KG. Utilizing Trade Map net imports on the other hand results in a per capita consumption of 2.30 KG per capita which is in line with other regional consumers such as Singapore and Taiwan.



Introduction To Durian Types & Prices

Durian is regarded by many people in Southeast Asia as “The King of Fruits”. The fruit is known for its thorn covering, unique taste and distinctive aroma. The term Durian emerged from the fruit’s distinctive thorn covering and comes from the Malay word Duri which means thorn. The Durian is believed to have originated from the Malay Archipelago. Although the Durian tree is native to Malaysia, Brunei and Indonesia, it is also grown in Thailand, the Philippines and Australia.

Durian is the fruit of several tree species belonging to the genus *Durio*. There are 30 recognized *Durio* species, at least nine of which produce edible fruit. There are over 100 named varieties in Indonesia, 300 in Thailand and 100 in Malaysia. Local Durian varieties are officially registered with the government of each country. Over the centuries, numerous Durian cultivars, propagated by clones, have arisen in Southeast Asia. A Durian cultivar is essentially a specific variety of Durian that has been deliberately selected for desirable characteristics such as fruit shape, size, smell, colour, texture, taste and tree characteristics. Most cultivars have a common name and a code number starting with “D”.

Durian, once considered a niche fruit is now gaining mass appeal with Durian demand, namely for the Musang King variety spreading throughout Asia. Demand has been driven predominantly by Chinese consumers who have become fascinated with it due to its unique taste and health benefits. Demand for Durian fruit has been rising due to Chinese consumer demand in terms of the fresh fruit and from F&B companies. Demand has been growing enormously with new Durian based products continuously being developed. Major global companies such as Nestle, F&N, McDonalds and Pizza Hut have all released Durian based products in effort to capture this growing market. F&B products cover 3 key market segments – Desserts which include Durian desserts such as ice cream and cakes, Snacks such as chips and candies and Beverages such as coffee and tea.



Durian Market Prices

The following price lists are provided as a guide for some of the most popular Durian varieties. Pricing has been collated from a variety of local based stores and converted to USD/KG. Kindly note that these prices are for reference purposes only with Durian market prices often changing due to seasonality and other demand and supply factors. Additionally, market prices are also a function of store location and perceived quality.

Figure 1 – Local Durian Prices

Name	Other Names	Country	Code	USD/KG
Musang King	Mau Shan Wang, Raja Kunyit, Cat Mountain King, Civet Cat King	Malaysia	D197	20-25
Sultan	Bukit Merah	Malaysia	D24	12-15
Golden Phoenix	Jin Feng	Malaysia	-	10-15
Red Prawn	Hong Xia, Ang Hei, Ang Heh	Malaysia	-	6-12
Green Bamboo	Tek Kah, Zhu Jiao, Qing Zhu, Buluh Bawa	Malaysia	D160	6-12
D101	-	Malaysia	D101	6-8
D13	-	Malaysia	D13	6-8
Monthong	Golden Pillow	Thailand	D159	4-5
Kan Yau	Kan Yao, Gaan Yaow, Gan Yau, Gaanyaaow	Thailand	D158	4-5
Cha Nee	Gibbon	Thailand	D123	3-5

Source: Durian Harvests

Musang King Durian which is also known as Mao Shan Wang or D197 is the most sought after and expensive Durian variety due to its appealing flavour and texture. Prices for Musang King Durian in the key markets of Malaysia, Singapore, Hong Kong and China are provided below for reference purpose. The following prices are as of late 2017.

Figure 2 – Musang King Durian Prices

Market	USD/KG
Malaysia	24.49
Singapore	27.81
Hong Kong	50.96
China	122.47

Source: Durian Harvests



Introduction

Global trade in Durian fruit is dominated by two countries at the moment - Thailand dominates exports and China dominates imports. According to Trade Map, the two largest exporters of Durian fruit in 2016 were Thailand and Malaysia with 403 million KG and 18 million KG respectively. Together these two countries accounted for 99% of global exports. It is important to note that data from Indonesia's statistical department indicates that Indonesia exported an average of 470 million KG of Durian over the past two years while Trade Map reports an average of 5 thousand KG. Trade Map data is the basis of global trade in this report and was assumed to be more accurate and reliable. This notable difference however does raise a red flag in terms of data accuracy. If Indonesia data was confirmed reliable, Indonesia would in fact be the world's largest exporter. Although Thailand and Malaysia are the largest exporters of Durian, the composition of their markets is quite different. Thailand's production is predominately exported, while production in Malaysia is consumed domestically.

Global trade in Durian can be quantified in two ways. Firstly via trade in raw fruit form and secondly through trade in Durian based end products. The retail value of Durian fruit trade, domestically and internationally, in raw fruit form (fresh, frozen, paste and pulp) was estimated to have a retail value of over 15 USD billion in 2016. Global demand by 2030 is conservatively expected to grow to more than 25 USD billion, driven primarily by Chinese demand.

In terms of Durian end products, the global trade value is difficult to ascertain due to the limited availability of data. Durian is still considered a relatively niche product with growth still in its infancy. Durian end products include the market segments of desserts, snacks and beverages. Its share of these markets is unknown but combined in Asia are worth over 275 USD billion annually and growing. Durian end products have been growing in prominence over the past couple of years with large F&B brands such as Pizza Hut, KFC, Nestle and Starbucks introducing products to capture customer demand.



The Durian market is in the unique position of not only being in high demand but also of being insufficiently supplied. Specifically, the Musang King Durian variety from Malaysia is highly demanded in the region due to its superior flavour. Existing supply levels have been insufficient to meet demand leading to rising prices for all consumers, none more so than in China. Additional supplies will be needed to meet rising demand with global trade expected to reach 2 billion KG by 2030. This is without taking a significant increase in Chinese consumption per capita into account - which is highly likely. At the moment China's only consumes 0.21 KG of Durian per capita compared to comparable countries such as Singapore, Taiwan and Hong Kong with approximately 3 KG per capita.

KING OF FRUITS



Durian
McFlurry™ Party

Durian
McFlurry™

Durian Cheese Tart



HOKKAIDO
BAKED CHEESE TART

パイチーズタルト

“ Durian based products are continuously being developed by companies worldwide to meet growing demand ”



Durian Exports

According to Trade Map, the largest exporter of Durian fruit globally in 2016 was Thailand with approximately 95% followed by Malaysia with 4%. In terms of volume, Thailand and Malaysia exported 402.70 million KG and 17.75 million KG, respectively. Thailand's dominance over Malaysia in the export market has existed for over a decade. It has occurred for three inter-related reasons: domestic market fundamentals, supply and trade regulation.

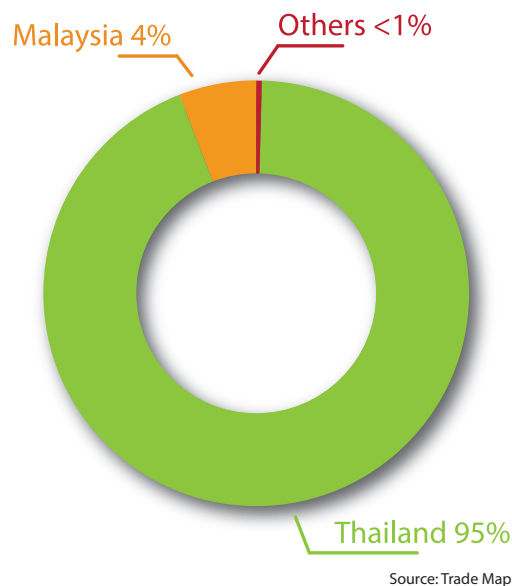
Durian is native to both Thailand and Malaysia, with over 300 named Durian fruit varieties in Thailand and over 100 in Malaysia. Although consumption is high in both countries, it is significantly larger in Malaysia. Both countries exhibit different domestic market fundamentals, with Malaysian durian consumption per capita in 2016 reaching 11 KG while Thailand's was 1.5 KG.

Thailand's consumption per capita has notably changed since 2008 dropping from approximately 6 KG to 1.5 KG in 2016 driven by a lucrative export market. Durian exports have significantly increased over the years accounting for 38% of Thailand's total Durian production in 2008 and rising to 80% in 2016. The increase in exports is due to rising Chinese demand rather than any sudden change in Thailand's appetite for Durian. This implies that Thailand may be facing a supply shortage unable to cope with both internal and external demand and that the price increase of Durian abroad has made it substantially more profitable to export.

Malaysia has historically had a higher level of per capita consumption than Thailand and still does. This factor combined with the limited supply of its Musang King Durian variety, which is in high demand, and Chinese restrictions on its fresh fruit has limited its Durian exports. Malaysian Durian production has risen from an average 300 million KG over the period 2005-2010 to approximately 370 million KG. The fact that exports have still remained at such low levels despite production rising and Musang King being so expensive and in high demand indicates there is insufficient supply to meet demand domestically and abroad.

The price of Malaysia's Musang King Durian is up to 350% higher than in Malaysia, selling for over 120 USD/KG. The high price is a combination of demand arising from its superior flavour and the lack of available supply. China does not currently allow for fresh fruit Durian imports in whole form meaning all such Durian sold is illegally brought in and thus commanding a high price. China currently only allows Malaysian Durian imports in pulp, frozen and chilled form although this is expected to change in 2019.

Figure 3 – Global Durian Exporters (Volume)



Source: Trade Map



As can be seen in Figure 4, Chinese Durian imports have risen substantially since 2002. Chinese consumption in the last decade has increased 13% p.a, with Thai exports keeping pace growing 11% p.a. Malaysian exports on the other hand have only increased negligibly by 0.41% p.a. since 2006. Malaysian Durian, primarily of the Musang King variety, commands substantial price premiums on the export market. The fact that Malaysian exports have been flat over the years indicates a fundamental issue with their Durian market. Its growth has been limited due to lack of supply and Chinese fresh whole fruit import restrictions.

The Malaysian government, upon noticing the significant loss of potential earnings due to the rise in price and high demand for its most expensive Musang King variety, has begun to actively make it a point of focus. The government has made Musang King domestic production and exports a key priority recently with both the Ministry of Agriculture and Agro-based Industry along with FELDA (Federal Land Development Authority) promoting Durian globally.

In late 2017, Malaysia held a 3 day Musang King Durian festival in Nanning, China that had over 160,000 visitors, with many queuing up to three hours under rain and sun to try the Durian. The event was highly successful and confirmed the marketability and demand for Musang King. The Malaysian government on the back of this has spearheaded efforts for fresh fruit importation approval. Malaysia's Agriculture and Agro-based Industry Ministry is expected to receive approval to export fresh whole Musang King Durian sometime in 2019.

Unlike Malaysian Durian, Durian from Thailand faces no trade restrictions. Approximately 80-90% of Thailand's Durian production has been exported to China annually between 2012 and 2017. Thailand is one of China's largest suppliers across a variety of fruits and vegetables, in addition to Durian, due to the Free Trade Agreement signed between the countries in June 2003. Under the agreement, tariffs for 188 types of fruits and vegetables were cut to zero resulting in Thailand's produce flooding the Chinese market and dominating market share. As can be seen in Figure 6, Thailand has been supplying China with essentially all their imports of Durian.

Monthong Durian is the main variety exported due to its flavour being sweeter than other Thai varieties and more appealing to Chinese consumers and other foreign markets. Monthong can also be kept under suitable conditions for a longer time, around 20 days, without overly softening or spoiling. This feature allows Monthong to be exported to more distant markets than is possible with other Thai varieties.

Figure 4 – Chinese Imports vs. Key Exporters (KG, '000)

	Imports	Exports	
	China (Global)	Malaysia	Thailand
2002	97,762	26,886	85,831
2003	98,493	26,000(26)	73,262
2004	97,743	23,573	120,887
2005	96,389	20,531	132,781
2006	98,353	17,041	137,391
2007	122,395	14,089	157,474
2008	157,754	19,443	203,127
2009	228,621	19,624	256,172
2010	201,147	15,390	207,501
2011	228,095	19,515	271,949
2012	266,212	23,521	351,124
2013	292,741	20,152	367,057
2014	358,317	13,215	369,602
2015	329,513	19,892	358,192
2016	318,797	17,754	402,660

Source: Trade Map





“ **China** is the world’s largest and fastest growing Durian market with over **290 million** KG of imports per year ”

Durian Imports

China is the world's largest importer of Durian with approximately 292 million KG imported in 2016. Its imports have risen significantly over the past decade, up 13.12% p.a. between 2006 and 2016. China accounts for 60 - 80% of global imports depending on the source of data. UN Comtrade data indicates the figure is 82% while Trade Map suggests its 66%. This is due to Trade Map including Vietnamese imports based on mirror data which raised total global imports and reduced China's share.

It is important to reiterate that imports for Hong Kong are based on net imports rather than imports, in order to more accurately represent trade. Hong Kong is a known re-exporter primarily to China, thus utilising their reported import figures would distort and misrepresent the entire market. For example, according to Trade Map Hong Kong imported 318.80 million KG of Durian, which would make it the world's largest importer. However, Trade Map also indicates Hong Kong exported 301.80 million KG of Durian. These figures indicate that Hong Kong is re-exporting the majority of Durian, most likely to China.

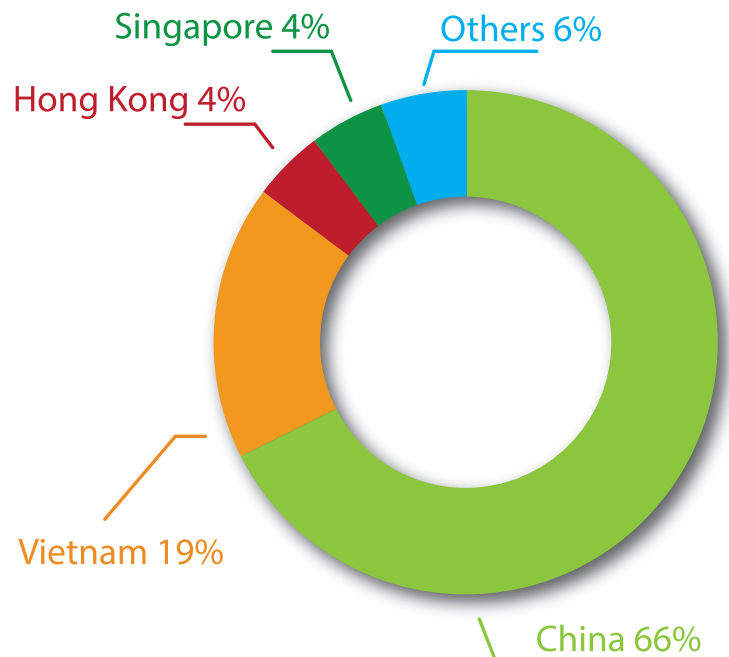
Although China dominates imports, its fascination with Durian is only a decade old. Durian fruit is not native to China with Chinese consumers first exposed to it in Thailand and Malaysia. Chinese imports in terms of volume began increasing notably from 2006, rising 13% p.a. between 2006 and 2016. Though the volume increase is substantial, it has been significantly outpaced by the increase in the value of imports in which rose 23% p.a. over the same time period. Although this rapid growth has surprised many it has not been entirely unexpected. Durian consumption has been high for decades in regional countries with ethnic Chinese populations. Mainland Chinese have similar taste profiles with consumption per capita logically following a similar path. The question regarding Chinese Durian imports is a matter of when rather than if imports will rise substantially.

Figure 6 – China: Imports of Durian (USD '000)

	Global	Thailand	Malaysia
2011	234,303.08	234,303.50	0.30
2012	399,752.60	399,751.70	0.92
2013	543,165.40	543,165.10	0.34
2014	592,624.80	592,624.80	-
2015	567,886.40	567,883.90	2.46
2016	693,578.70	693,577.20	1.54

Source: Trade Map

Figure 5 – Global Durian Importers (Volume)



Source: Trade Map

Durian from Thailand has thus far completely dominated Chinese imports. This development is a result available supply rather than demand driven through a superiority of product over Malaysian Durian. Malaysia Durian, particularly the Musang King variety, is known to be in higher demand due to its superior flavour profile but limited supply and Chinese import restrictions have hindered exports. China currently does not allow for Malaysian Durian to be imported in whole form, requiring imports to be in frozen, pulp or paste form.

Global Durian Trade

Thailand on the other hand has had open access to the entire Chinese market with no restrictions upon the signing of a Free Trade Agreement between both countries in June 2003. It is thus no surprise to see that Chinese imports grew significantly post the agreement and that Thailand has dominated imports entirely. Malaysia since 2017 has actively made Musang King Durian a point of focus after realizing the significant loss of potential earnings due to record prices and its high demand. China in 2019 is expected to approve Durian imports from Malaysia in whole fruit form which is expected to drastically alter the Durian marketplace with Malaysia capturing market share from Thailand.

Vietnam is the world's second largest importer of Durian according to Trade Map data although it does not report trade statistics. UN Comtrade excludes Vietnam but Trade Map estimates its imports based on data reported by partner countries known as mirror data. Vietnam reportedly imported 85 million KG of Durian in 2016 accounting for 19% of global imports. Vietnam was followed by Singapore and Hong Kong with 4% each or 17 million KG and 17.9 million KG, respectively.

Vietnam surprisingly accounts for a large share of global imports according to Trade Map. This data is unexpected and has been noted by other experts in the field as well. Some believe that imports are being re-exported to China rather than domestically consumed. For example, Panuwat Maikaew who is the president of the Chanthaburi Durian and Mango Export Association in Thailand believes 80-85% of Vietnams imports are re-exported to China. Trade statistics indicate otherwise however with Trade Map reporting a negligible amount of exports totalling 407,000 KG in 2016.

Figure 7 – Major Durian Export Transport Routes



Source: Nikkei Asian Review (2018) Thai exports of 'the king of fruits' surge to China, Available at: <https://asia.nikkei.com/Business/Business-Trends/Thai-exports-of-the-king-of-fruits-surge-to-China> (Accessed: 2018).

This report is based purely on reported trade data rather than unsubstantiated claims. Nonetheless, the claims may indeed be accurate and present a concern that trade statistics are under-reporting Durian trade entirely. Cross-border roads have been built and continue to be built. Those roads connected Vietnam, Laos, Thailand, Myanmar and Cambodia. This has increased ground transportation and trade rapidly by connecting China to the countries of the Mekong Basin. It is believed that Durian from Thailand is flowing through Vietnam through these roads and not captured as exports due to tax reasons or inefficiency in border controls.



“ **Global Durian consumption**
is valued at **14 USD billion annually** and rapidly growing ”



Current Durian Demand

Global demand in 2016 was estimated to be 1.5 billion KG. In terms of retail value, that is approximately 15 billion USD based on a retail price of 10 USD/KG. Global trade indicated by import volumes accounted for 30% of total demand with the largest domestic consumers being Indonesia, Thailand and Malaysia.

Global demand has been quantified by combining global trade measured by imports and the domestic consumption of Thailand, Malaysia and Indonesia. Thailand, Malaysia and Indonesia are known to be large consumers of domestically grown Durian fruit which is not taken into account in trade data.

As a result, their data was added to get a more complete and thorough representation of demand. Other countries such as the Philippines, Vietnam and Australia produce Durian that is domestically consumed as well however their combined quantity is relatively insignificant. Their data was considered immaterial to this analysis and was not taken into account.

Once again it is important to note that data from the Indonesia's statistical department, Badan Pusat Statistik, indicates that Indonesia exported an average of 470 million KG of Durian over the past two years while Trade Map reports an average of 5 thousand KG. Data from the Indonesian government was assumed to be accurate for domestic consumption purposes as it results in a per capita figure of 2.40 KG which is in line with other reports. Global imports however are based on Trade Map data for data consistency throughout this report. It is important to note however that if Indonesia reported data is indeed accurate, it would result in global import figures being underreported by Trade Map by approximately 470 million KG. Trade Map figures are relied upon by industry analysts and the media which is worrisome considering they are almost definitely inaccurate.

Figure 8 – Global Durian Demand

	KG	% of Total
Global Trade	440,138,000	29.84%
Domestic Consumption	1,034,948,000	70.16%
Thailand	100,834,000	-
Malaysia	348,379,000	-
Indonesia	585,735,000	-

Sources: Trade Map
 Wannarat Tantrakonnsab and Nattapon Tantrakoonsab (2018) Thai Export of Durian to China: BRC Research Report Bangkok Research Center, JETRO.
 Jabatan Pertanian (Department of Agriculture) (2015) Statistik Tanaman Buah-Buahan (Fruit Crops Statistics): Jabatan Pertanian (Department of Agriculture). [2015 data was used a proxy]
 Beritagar (2018) Produksi buah nasional masih berpusat di Jawa , Available at: <https://beritagar.id/artikel/berita/produksi-buah-nasional-masih-berpusat-di-jawa> (Accessed: 2018). [2015 data was used a proxy]
 Beritagar (2018) Berburu durian, nangka, dan rambutan di musim penghujan , Available at: <https://beritagar.id/artikel/berita/berburu-durian-nangka-dan-rambutan-di-musim-penghujan> (Accessed: 2018).



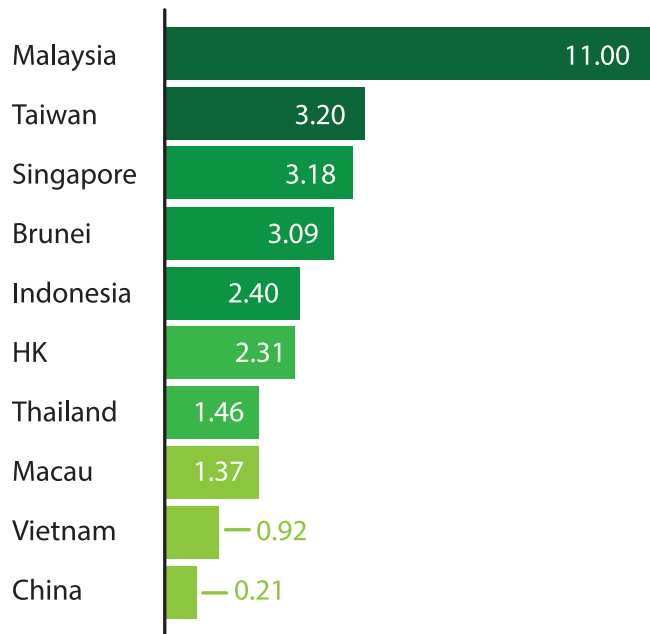
Domestic Consumption per Capita

Malaysia is the world's largest consumer of Durian fruit per capita with an estimated 11 KG in 2016. To put this figure into perspective Malaysia per capita, consumed approximately 1.8x more Durian than beef and 3x more Durian than tomatoes. Unlike other countries Malaysian consumption is almost entirely supplied by domestic supply. It imported 11.9 million KG of Durian and consumed 381 million KG in 2016.

Thailand, despite being one of the largest producers and exporters of Durian, surprisingly lags other regional countries in terms of consumption. Thailand's consumption has notably changed since 2008 dropping from approximately 6 KG per capita to 1.5 KG in 2016. As can be seen in Figure 10, exports and domestic consumption per capita have been inversely correlated since 2010. Durian exports have significantly increased over the years accounting for 38% of Thailand's total Durian production in 2008 and rising to 80% in 2016.

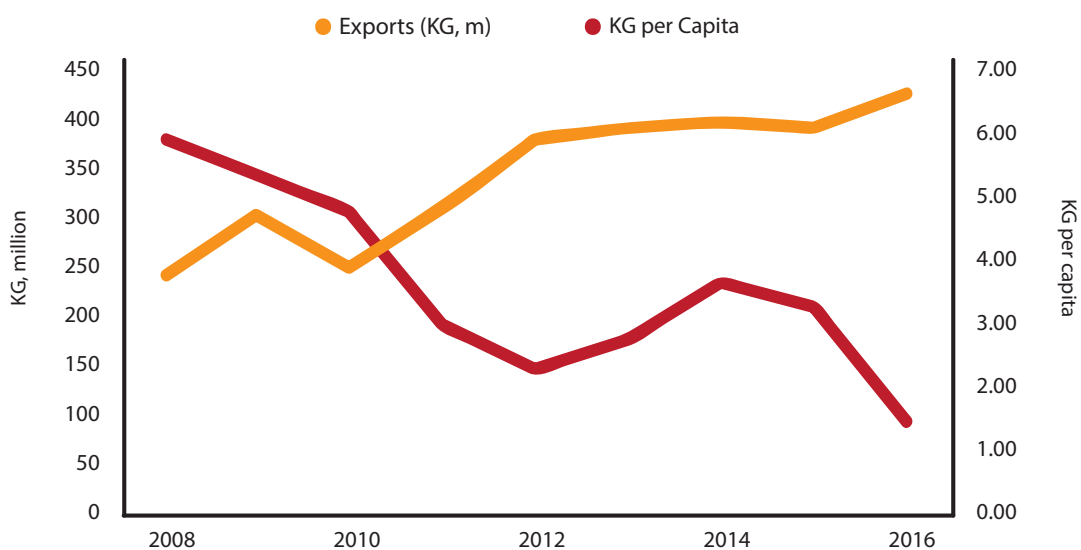
The reduction of domestic consumption is believed to be attributed entirely to growing Chinese demand rather than any sudden change in Thailand's appetite for Durian. This indicates that Thailand is likely facing a supply shortage unable to cope with both internal and external demand. The substantial price increase of Durian abroad has made it considerably more profitable to export likely impacting access to supply domestically.

Figure 9 – Durian Consumption per Capita (KG)



Sources: Trade Map
 The World Bank [population data]
 Department of Statistics Malaysia (2015) Supply and Utilization Accounts Selected Agricultural Commodities, Malaysia 2010-2014; Department of Statistics Malaysia. [2014 Malaysian data was used a proxy]
 Beritagar (2018) Produksi buah nasional masih berpusat di Jawa , Available at: <https://beritagar.id/artikel/berita/produksi-buah-nasional-masih-berpusat-di-jawa> (Accessed: 2018). [2015 data was used a proxy]
 Beritagar (2018) Berburu durian, nangka, dan rambutan di musim penghujan , Available at: <https://beritagar.id/artikel/berita/berburu-durian-nangka-dan-rambutan-di-musim-penghujan> (Accessed: 2018).
 Wannarat Tantrakonnsab and Nattapon Tantrakonnsab (2018) Thai Export of Durian to China: BRC Research Report Bangkok Research Center, JETRO.

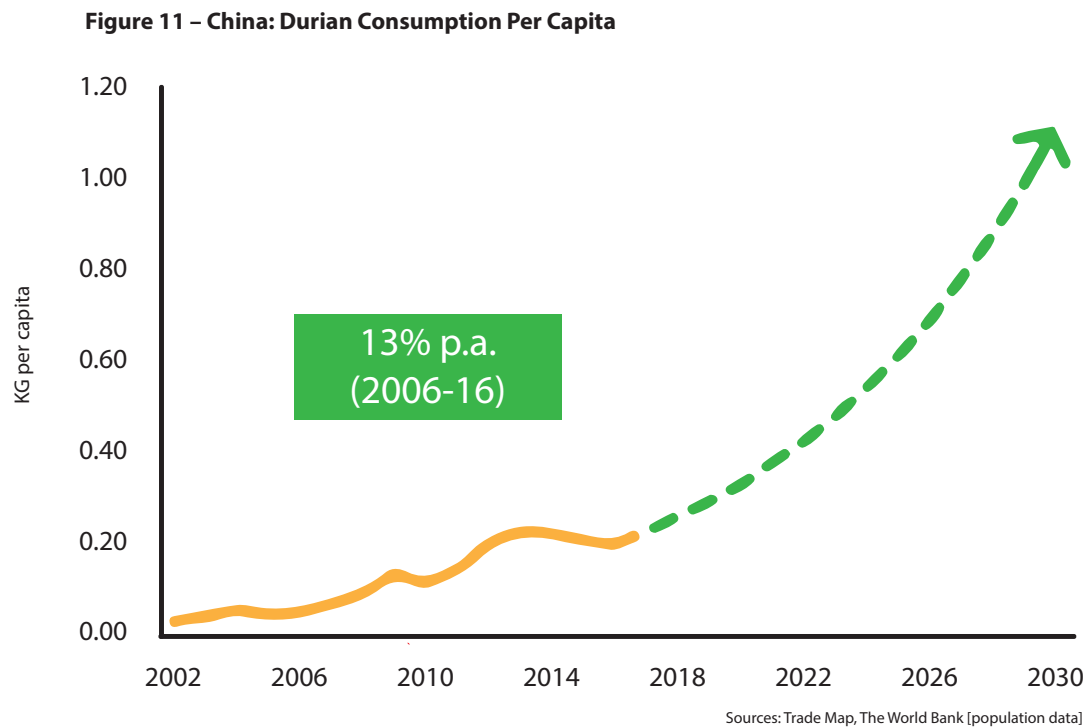
Figure 10 – Thailand: Durian Exports vs. Consumption per Capita



Source: Trade Map
 The World Bank [population data]
 Karolien Bais (2016) Why Thailand is the leading exporter of durian, mangosteen and other tropical fruits: UTAR Agriculture Science Journal.
 Wannarat Tantrakonnsab and Nattapon Tantrakonnsab (2018) Thai Export of Durian to China: BRC Research Report Bangkok Research Center, JETRO.

China's Rising Consumption

China's consumption per capita in 2016 was 0.21 KG which was significantly lower than other regional countries. China's fascination with Durian however is only a decade old with consumers first exposed to it abroad in Thailand and Malaysia. As a result per capita consumption is expected to rise significantly over time. Thailand has dominated exports to China due to their astute focus on China as a key export destination and the existing Free Trade Agreement which began in 2003. China's consumption per capita has increased 13% p.a. since 2006 from 0.07 KG to 0.21 KG in 2016. If growth continues as it has, consumption is expected to reach 1.11 KG per capita by 2030. Growth is expected to realistically reach 3 KG per capita in the long term so that it is in line with regional countries with similar tastes.



Although Durian consumption in its totality is expected to increase there is one variety which is specifically demanded, Musang King. Musang King Durian demand is already high with limited supplies increasing prices globally none more so than in China. Demand has been so exorbitant from the Chinese that entire industries have developed to cater to it. Travel agencies have set up travel packages around Durian providing Chinese tourists with flights, accommodation and Durian plantation tours. In addition, some plantations have also begun offering their own tours and even built accommodation on site to cater to Chinese tourists. Spas have also been developed on Durian plantations too. All this is in addition to multiple renowned hotels, such as the Shangri-La, offering durian travel and dining packages.

Malaysia has historically had a higher level of per capita consumption than Thailand and still does. This factor combined with the limited supply of its highly in demand Musang King Durian variety and Chinese restrictions on its importation has limited its Durian exports. Malaysian Durian production has risen from an average 300 million KG over the period 2005-2010 to approximately 370 million KG in 2016. The fact that exports have still remained at such low levels, despite production rising and Musang King being so expensive and in high demand, indicates there is insufficient supply to meet demand domestically and abroad. This has stifled Chinese imports and consumption which is expected to increase substantially once Malaysia receives approval for fresh whole fruit exports sometime in 2019.



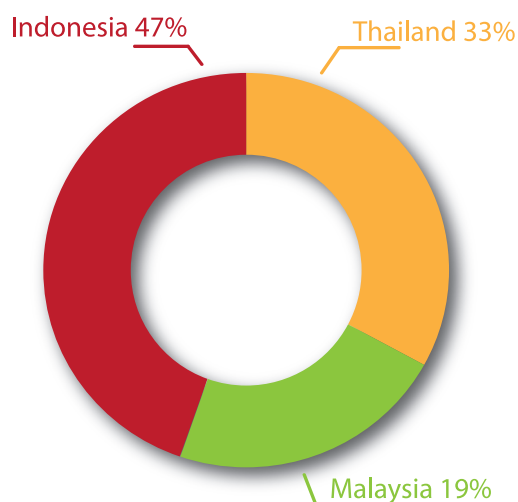
Current Durian Supply

Global supply based on total production in 2016 was estimated to be 1.6 billion KG. Indonesia was the world's largest producer with 47% followed by Thailand with 33% in 2016. This figure was based on the production levels of known key producers – Thailand, Malaysia and Indonesia. Other countries such as the Philippines, Vietnam and Australia produce Durian as well however their quantity is relatively insignificant and was not taken into account. Other countries not included in this analysis are believed to account for approximately 5% of total production and are entirely focused on domestic consumption rather than exports.

It's important to highlight that global demand earlier in this report was reportedly 1.5 billion KG. Demand and supply should realistically equal each other although this is rarely the case when analysing trade data.

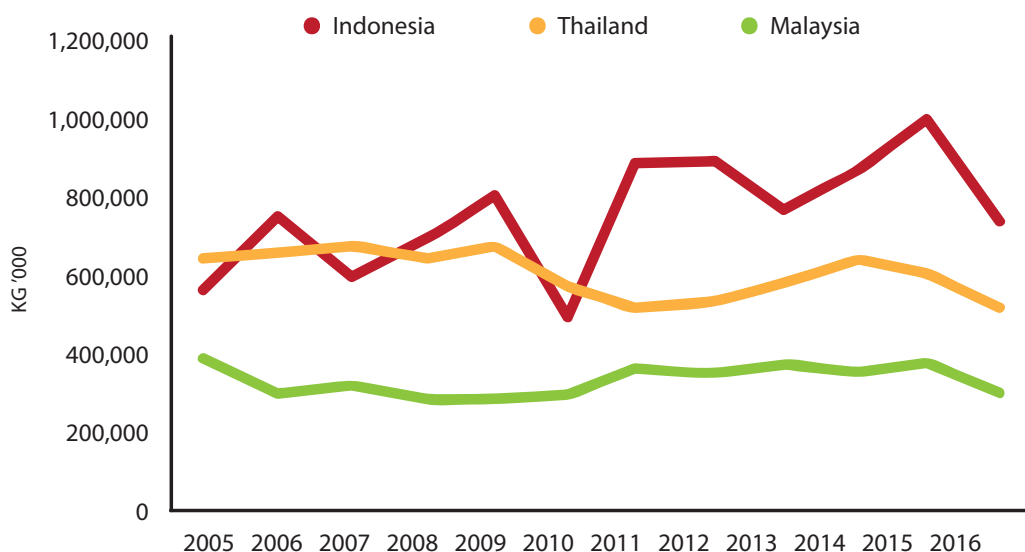
The mismatch is due to inefficiency in data collection by reporting bodies. This inefficiency means that trade data tends to underreport actual trade. As an example of data discrepancy, data from Indonesia indicates it exported an average of 470 million KG over the past two years while Trade Map reports an average of 5 thousand KG. Supply data was based on each country's records of production while trade data was based on Trade Map. It is worth noting is that total production levels are deemed to be more accurate than Trade Map figures because they rely on data directly from only 3 countries compared to over 40 for Trade Map which is based on import and export data.

Figure 12 – Total Durian Production (Volume)



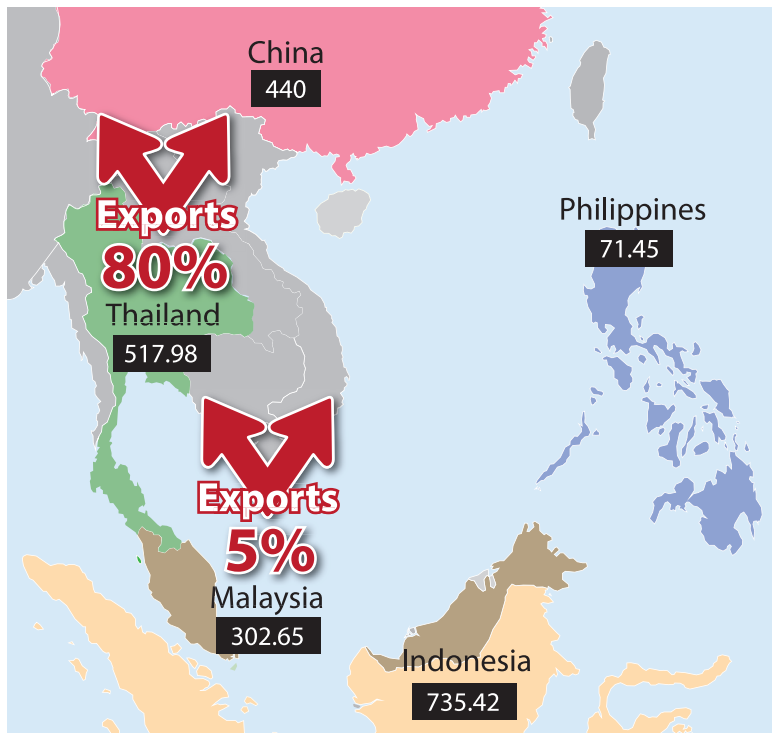
Sources:
 Beritagar (2018) Berburu durian, nangka, dan rambutan di musim penghujan , Available at: <https://beritagar.id/artikel/berita/berburu-durian-nangka-dan-rambutan-di-musim-penghujan> (Accessed: 2018).
 Wannarat Tantrakonnsab and Nattapon Tantrakoonsab (2018) Thai Export of Durian to China: BRC Research Report Bangkok Research Center, JETRO.
 Jabatan Pertanian (Department of Agriculture) (2016) Statistik Tanaman Buah-Buahan (Fruit Crops Statistics): Jabatan Pertanian (Department of Agriculture).

Figure 13– Total Durian Production (KG '000)



Sources:
 Badan Pusat Statistik (2018) Tabel Dinamis Subjek Hortikultura, Available at: <https://www.bps.go.id/subject/55/hortikultura.html> (Accessed: 2018).
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 Khoo Teng Kew (2012) High-value differentiation of durian: Are we missing an opportunity?, 5th International Symposium on Tropical and Subtropical Fruits (Guangzhou, China).
 Jabatan Pertanian (Department of Agriculture) (2016) Statistik Tanaman Buah-Buahan (Fruit Crops Statistics): Jabatan Pertanian (Department of Agriculture).
 Jabatan Pertanian (Department of Agriculture) (2015) Statistik Tanaman Buah-Buahan (Fruit Crops Statistics): Jabatan Pertanian (Department of Agriculture).

Figure 14 – Domestic Durian Production (KG, million)



Sources: Refer to Figure 15

Production in Indonesia has been relatively inconsistent ranging between 600-995 million KG since 2005. This is likely due to erratic yields owing to natural factors. Indonesian agricultural production is known to be quite variable due to forest fires that have become a seasonal phenomenon. The fires result from the practice of slash and burn forest clearance where land is set on fire as a cheaper way to clear it for new planting. The fires typically spread out of control with resulting haze impacting agricultural yields and taking months to clear.

Unlike Indonesian production, production levels in Thailand and Malaysia have been relatively consistent since 2005. Thailand and Malaysia have produced an average of 600 million KG and 330 million KG, respectively.

Although Durian production in total is believed to be 1.6 billion KG, not all Durian are made equal with many different types of Durian available. Musang King Durian specifically is in high demand and expected to drive growth in the industry, particularly in China. Musang King had a supply of only 500,000 mature trees in Malaysia as of 2017. The total expected fruit production per year is forecast to be 50 million KG, assuming all 500,000 existing trees produce 50 fruit per year and weigh 2 KG. This is the equivalent of only 3% of total imports globally and indicates a severe supply demand imbalance.



Durian Production Figures

Figure 15

1

735.42 million KG of Durian produced

80% of Indonesia's Durian production is based on the islands of Java and Sumatra. In 2016, the province of East Java accounted for 27% of total Durian production followed by Central Java and North Sumatra with 10% each.

Indonesia



2

517.98 million KG of Durian produced

The majority of Thailand's Durian production occurs in its South & South Eastern Provinces. 38% of total Durian production occurred in the province of Chanthaburi followed by Chumphon and Rayong with 16% and 15% respectively in 2008.

Thailand

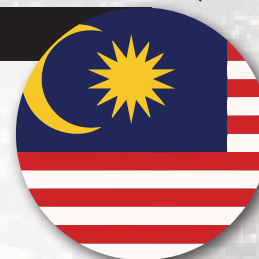


3

302.65 million KG of Durian produced

82% of Malaysia's Durian production is based on Peninsular Malaysia also known as West Malaysia. The state of Pahang accounted for 28% of total Durian production in the country followed by Johor and Kelantan with 17% and 12% respectively in 2016.

Malaysia



4

71.45 million KG of Durian produced

Durian production in the Philippines is highly concentrated on its southern island of Mindanao. The region of Davao is the largest producer in the country followed by the Autonomous Region in Muslim Mindanao (ARMM), both situated on Mindanao. In 2016, Davao produced 75% of total Durian production in the country followed by ARMM with 9%.

Philippines



Note: All production figures above refer to production that occurred 2016.

Sources:
Indonesia: Badan Pusat Statistik (2018) Tabel Dinamis Subjek Hortikultura, Available at: <https://www.bps.go.id/> (Accessed: 2018).
Beritagar (2018) Berburu durian, nangka, dan rambutan di musim penghujan, Available at: <https://beritagar.id/artikel/berita/berburu-durian-nangka-dan-rambutan-di-musim-penghujan> (Accessed: 2018).

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Philippines: Philippine Statistics Authority (2017) Crops Statistics of the Philippines (2011-2015): Philippine Statistics Authority.
Panay News (2018) Research initiative for the "king of fruits", Available at: <https://www.panaynews.net/research-initiative-for-the-king-of-fruits/> (Accessed: 2018).



**Total trade for Durian fruit
is expected to reach**

4.5 Billion KG

by 2030 "



Global Durian Trade

Total trade for Durian fruit is expected to grow from approximately 1.5 billion KG in 2016 to over 2.7 billion KG by 2030 in our conservative scenario. Our growth scenario which is highly plausible as well, expects trade to reach 4.5 billion by 2030. In terms of USD value, trade is expected to rise from 15 USD billion in 2016 to over 35 USD billion by 2030. Our growth scenario expects trade to reach 90 USD billion by 2030. Consumption per capita in China under the conservative and growth scenario is expected to reach 0.78 KG and 1.46 KG, respectively. Population growth was based on growth figures provided by the United Nations under their medium growth variant scenario. Chinese consumption under both growth scenarios still lags other regional countries. China is expected in the long term to reach a consumption level of 3 KG per capita to be in line with Taiwan and Singapore.

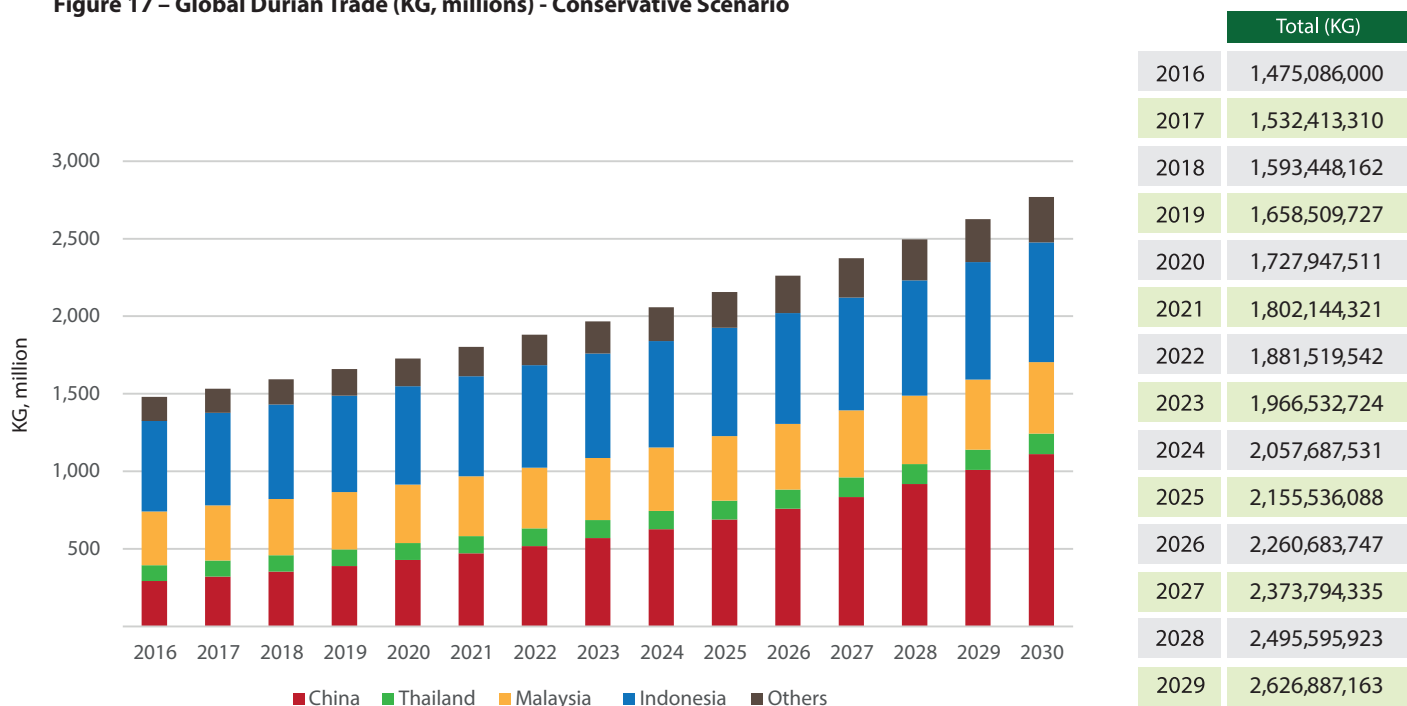
Global trade has been identified as global imports plus the domestic consumption of the key markets of Thailand, Malaysia and Indonesia. Total future trade was calculated based on three key subsectors of data and markets– high growth, growth and mature growth markets. Figure 16 indicates the assumptions behinds the growth projections.

Figure 16 – Expected Durian Market Growth Assumptions

Variable	Future Growth (Conservative Scenario, p.a.)	Future Growth (Growth Scenario, p.a.)	Comments
Price (USD/KG)	2%	5%	Base assumption is 10 USD/KG. Prices have risen up to 50% p.a. between 2014-2017 in Malaysia and more overseas.
China	10%	15%	High growth market. Imports by volume up 13.12% p.a. between 2006 and 2016.
Thailand	2%	5%	Mature market with domestic supplied consumption.
Malaysia	2%	5%	Mature market with domestic supplied consumption.
Indonesia	2%	5%	Mature market with domestic supplied consumption.
Other Countries	5%	7.5%	Growth market with imports by volume up 7.45% p.a. between 2006 and 2016.

Source: Durian Harvests

Figure 17 – Global Durian Trade (KG, millions) - Conservative Scenario



Source: Durian Harvests



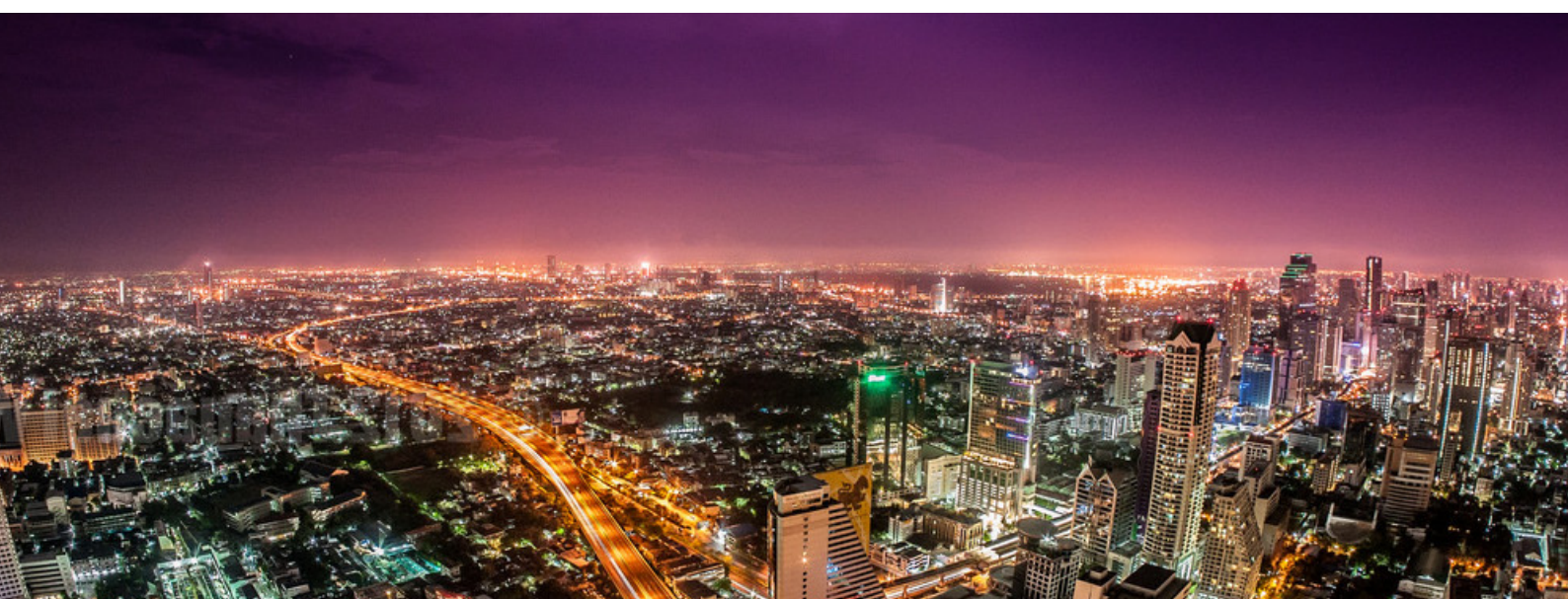
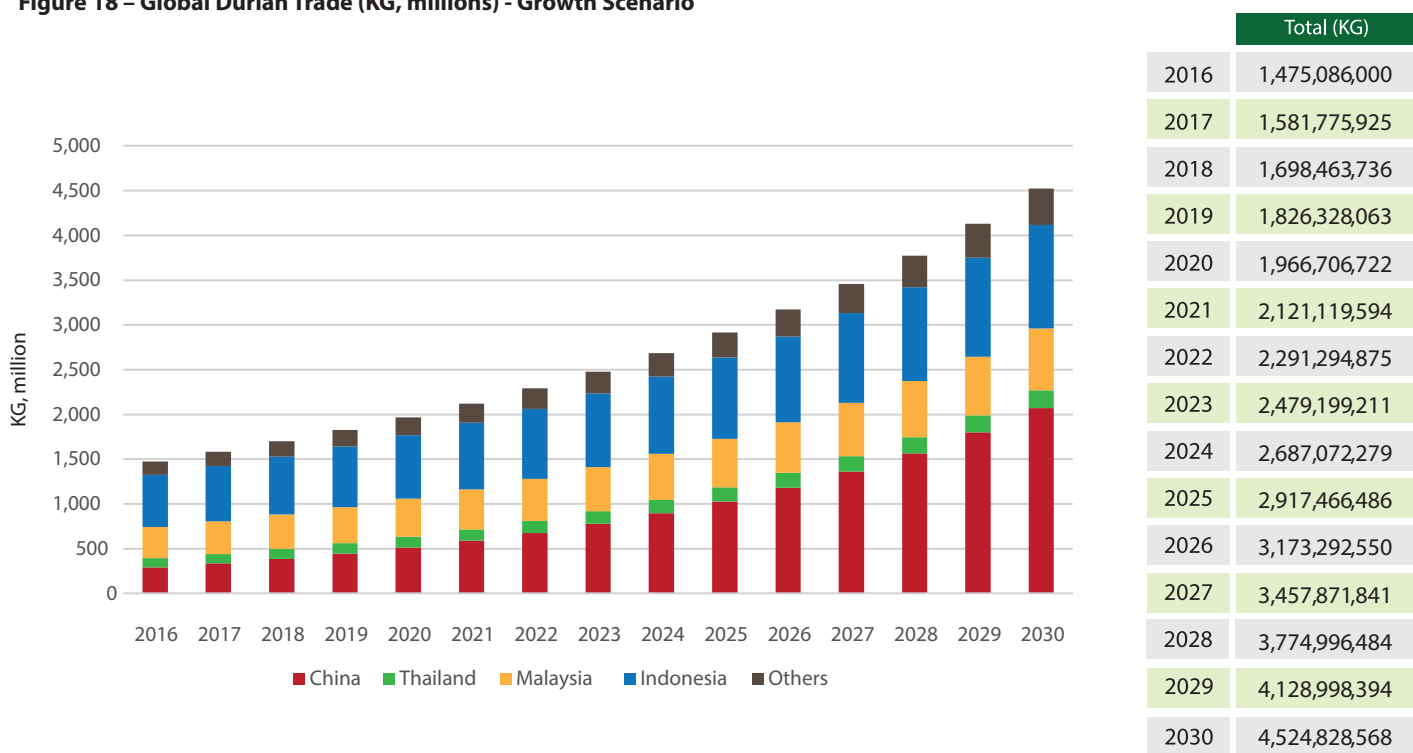
“**China's**
Durian imports have grown
13.12% per year
since 2006”

Expected Market Growth

China was classified as a high growth market being the world's largest importer of Durian and fastest growing consumer market. China is the world's largest importer of Durian with approximately 292 million KG imported in 2016. China share of imports ranges between 60 - 80% of global imports depending on data source. UN Comtrade data indicates the figure is 82% while Trade Map suggests it is 66%. This is due to Trade Map including Vietnamese imports based on mirror data which raised total global imports and reduced China's share. Regardless, Vietnamese imports are believed to be destined towards China indicating China is the key export market irrespective of data source.

Growth markets include all countries except for China with reported Trade Map imports. They include high consumption countries such as Taiwan, Singapore, Brunei, Hong Kong and Macau. Mature markets include Thailand, Malaysia and Indonesia all of which have been consuming domestically grown Durian for hundreds of years. Although they are known to import Durian as well their demand is not expected to grow as fast as other countries who are reliant on imports and do not have domestic production.

Figure 18 – Global Durian Trade (KG, millions) - Growth Scenario



Durian Supply Requirements

Total Durian trade was approximately 1.5 billion KG in 2016. As noted earlier this figure is likely higher however and closer to 2 billion KG due to unreported data which has not been captured in data sources. By 2030 total trade is expected to reach between 2.8 and 4.5 billion KG which will require a substantial increase in supply to be met. Demand is expected to be driven by two key growth factors - Musang King Durian fruit demand and demand for Durian based end products of all Durian varieties. China in both instances will be the main consumer market.

The total supply of Durian in terms of production was approximately 1.6 billion KG in 2016. As indicated earlier in this report, production in Thailand and Malaysia has been relatively consistent since 2005 averaging 600 million KG and 330 million KG, respectively. Indonesian production has been more volatile ranging between 600-995 million KG due to inconsistent yields.

Figure 19 indicates the supply imbalance resulting from the projected conservative and growth scenarios. As indicated earlier in this report, total supply is based on the total level of production in 2016 which was estimated to be 1.6 billion KG. As can be seen in the figure by 2030 there will be a supply shortfall of 1.3 billion KG and 3 billion KG depending on scenario. This is the equivalent of approximately 12.6 million Durian trees in the conservative scenario and 30.3 million trees in the growth scenario. The tree figures presented are based on a Durian tree yielding 50 fruit per tree with an average fruit weight of 2 KG. We would like to note that tree yields increase as a tree ages with the 50 fruit per tree used as an approximation. For example, a tree at age 5 may yield 10 fruit and by age 20 yield up to 100 fruit.

Figure 19 – Projected Durian Supply Imbalance (2017-2030)

	Conservative Scenario		Growth Scenario	
	KG	Trees	KG	Trees
2017	9,637,930	96,379	59,979,175	599,792
2018	71,338,250	713,383	178,379,588	1,783,796
2019	137,078,593	1,370,786	308,042,148	3,080,421
2020	207,208,730	2,072,087	450,308,952	4,503,090
2021	282,111,741	2,821,117	606,704,375	6,067,044
2022	362,207,286	3,622,073	778,961,335	7,789,613
2023	447,955,199	4,479,552	969,051,434	9,690,514
2024	539,859,432	5,398,594	1,179,219,553	11,792,196
2025	638,472,403	6,384,724	1,412,023,564	14,120,236
2026	744,399,764	7,443,998	1,670,379,922	16,703,799
2027	858,305,649	8,583,056	1,957,616,021	19,576,160
2028	980,918,438	9,809,184	2,277,530,313	22,775,303
2029	1,113,037,105	11,130,371	2,634,461,355	26,344,614
2030	1,255,538,181	12,555,382	3,033,367,117	30,333,671

Source: Durian Harvests

Musang King Supply Requirements

Although demand for all varieties of Durian will increase over the years Musang King Durian demand is expected to drive growth. This is particularly true for the export market which is driven primarily by China. The Chinese demand for Musang King has been so high that prices are up to 350% higher than found locally in Malaysia. Musang King is also highly in demand domestically in Malaysia but its consumption has been limited due to inadequate levels of supply. As a result, consumers are forced to purchase other varieties of Malaysian Durian which are readily available.

According to Malaysia's Agriculture Department, there are currently approximately 500,000 mature Musang King Durian trees in the country. This is the equivalent of 50 million KG worth of fruit and represents only 3% of total global durian trade comprised of Trade Map imports and domestic consumption in the key countries of Thailand, Malaysia and Indonesia. This figure is shockingly low and means that current Musang King supply can only meet 3% of annual global demand indicating a severe Musang King supply shortage.

Thailand currently accounts for up to 95% of global exports with its Monthong variety taking in the bulk of this although the exact figure is unknown. Malaysia's Musang King is in higher demand than all of Thailand's exports thus it can be surmised that it can potentially account for up to 95% of global exports. Musang King can theoretically replace a large share of existing consumption domestically as well as its highly demanded in Malaysia too.

The Malaysian government noticing the significant loss of potential earnings due to the rise in Musang King prices and high demand has been actively promoting it on the supply side by encouraging farmers to improve their existing operations and yields, and on the demand side by increasing awareness overseas. Malaysia has gone so far as to say that it can overtake palm oil as the preferred choice of new agricultural investment due to it being more profitable. To put things into perspective the palm oil industry in Malaysia accounts for up to 50% of agriculture's contribution to Malaysian GDP or 22 USD billion. The obstacle facing Musang King will not be one of demand as its demand is evident. Instead it will be on finding the correct balance between supply and price in order to optimise the fruits profitability.





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