MARKET RESEARCH ON THE FRESH FRUITS MARKET IN INDIA

The Embassy of Brazil, New Delhi

Submitted by: Food and Agri Strategic Advisory & Research (FASAR), YES BANK LIMITED

1. Executive Summary

India is one of the major emerging economy of the world and real gross GDP of India was US$ 2.71 trillion in FY21. In recent years, India had witnessed many demographic changes-like younger population (*65% of the population is below 35 years of age*), rising disposable incomes and rise of middle class which had resulted India to become a major consumption driven economy. In addition, there are shifting food consumption trends towards healthier and balance diet. The internet age has also led people to become global savvy and the consumption trends are picked up quickly. The demand arising from this huge middle-class population provides an immense opportunity for fruit exporters to India. Indian fruits production will not be able to meet this growing demand; additionally, there is opportunity for exports of wide variety of imported fruits to India which are not grown presently.

India imported around USD 2 billion of fruits in FY 21 and fruit imports in India is showing a healthier growth trend. This report which is a result of detailed study captures the opportunities in the Indian fruit import market and recommends short to medium term interventions to increase exports to India.

1.1. Brief Scope of Work

The Embassy of Brazil, New Delhi had mandated YES Bank to provide strategic advisory services for **carrying out "Market research on the Fresh Fruits Market in India**. The objective of this study is to make available to Brazilian exporter companies, a research on the sector of Fresh Fruit Market in India that contains qualified information prepared from market research. The study covers the following fruits:

080390 – Banana
080310 – Plantains
080420 – Figs
080430 – Pineapples
080440 – Avocados
08045010 – Guavas
080510 – Oranges
080521 - Mandarins
(Including Tangerines and Satsumas)
080550 - Lemons and Limes
080610 – Grapes
080711 – Watermelons
080719 – Melons
080720 – Papayas
080810 – Apples
080830 – Pears
080930 – Peaches
081010 – Strawberries
081040 – Airelas Blueberries and Other Fruits Gen. Vaccinium
081070 – Persimmons (Diospiros)
081090 – Carambolas (Averrhoa Carambola), Annonas, Lychee and Others

The report covers:

- Analysis of Trade flow in the sector
- Information on production/consumption and characteristics of the sector
- Information on logistics, distribution, pricing and retail chains
- Marketing analysis: demand, competition and macro environment
- Rules and regulations
- Breakdown of opportunities by product type made from the tables provided by the Embassy of Brazil, New Delhi

1.2. Methodology

This assignment involved both secondary research and primary data collected from various stakeholders to enable a detailed analysis of current state, prospects and potential opportunities in India's fresh fruit sector. The stakeholders covered are:

S No	Type	Stakeholders Covered
1	Intermediaries/ Traders/ Distributors	37
2	Importers	9
3	Exporters	10
4	Retailers-Modern Trade including online retail	8
5	Service providers- Cold chain, Logistics	5
6	Government Organizations, Trade Bodies, Experts	7
	Total	**76**

For secondary research authentic and government or international databases and websites were used like ITC Trade Map, FAO, APEDA, DGFT, NHB, Ministry of Agriculture etc.

1.3. Research Findings

The broad findings of the study are:

- Indian fruit consumption is increasing at a rapid rate of 15-20%, as per estimates. The pandemic has resulted in increased fruit consumption predominately-citrus.
- India to be an attractive market for fruit exports from other countries in near term due to demographic changes.
- Off-season fruit imports offer an opportunity and timing the supply chain is important; imported fruits should be marketed before arrival of the relevant Indian fruit season
- Imported fruits now command a high recall, even in Tier II and Tier III cities
- Only for minor fruits (cherries, avocado, persimmons etc.) the demand is localized in urban centers
- Apple and Citrus form a bulk of the Indian imports, with other commodities like pears, grapes, cherries, kiwi etc. are also imported. Brazilian exporters need to cement their presence in these two commodities initially (apple and citrus)
- Brazil has an immense opportunity in Indian market and needs to focus on tie-ups with large importers and organized retail. Buyer seller meetings can be arranged at regular intervals, as awareness among Indian importers for Brazil exporters is low. Such meetings can result in immediate opportunity in short term.

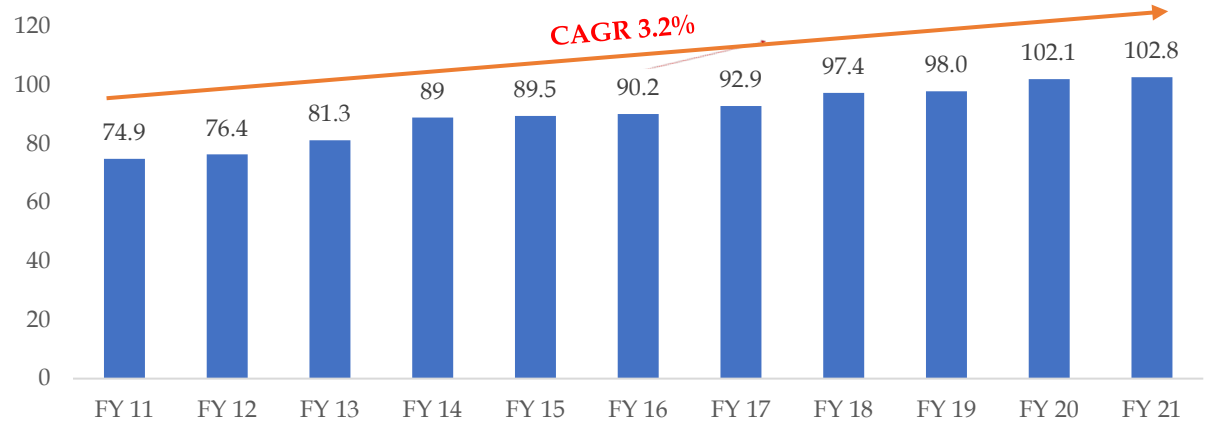
Recommendations and opportunity mapping for key commodities have been summarized in the last chapter.

2. Brief Overview of Fruit Sector in India

2.1. Indian Fruit Market-Brief Overview

In the year 2020-21[1], the total horticulture production in India reached ~330 million MT. With a production of 102.76 million MT, fruits contributed to ~32% to India's total horticulture production. Fruit production in India has been growing at a CAGR of 3.2% over the last 10 years (FY11 to FY21).

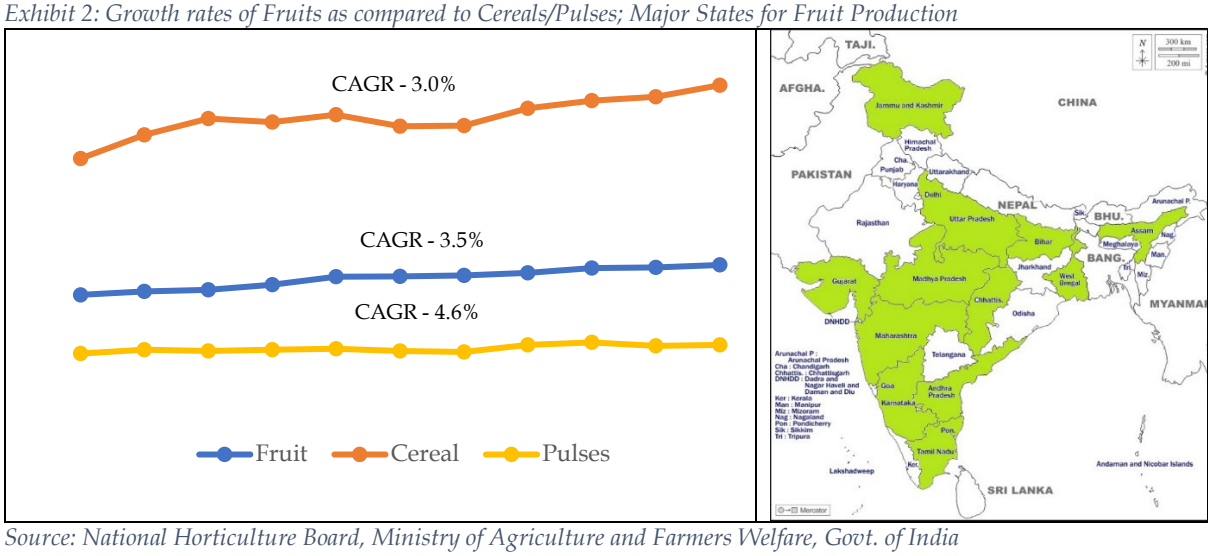
Exhibit 1: Indian Fruits Production Trend over last 10 years (Values in million MT)



Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India

Owing to changing income and demographic dynamics and underlying health benefits, India's fruit consumption has been growing at a CAGR of ~3.5% (FY10 to FY20), which is faster than growth in consumption of cereals during the same period.

Exhibit 2: Growth rates of Fruits as compared to Cereals/Pulses; Major States for Fruit Production

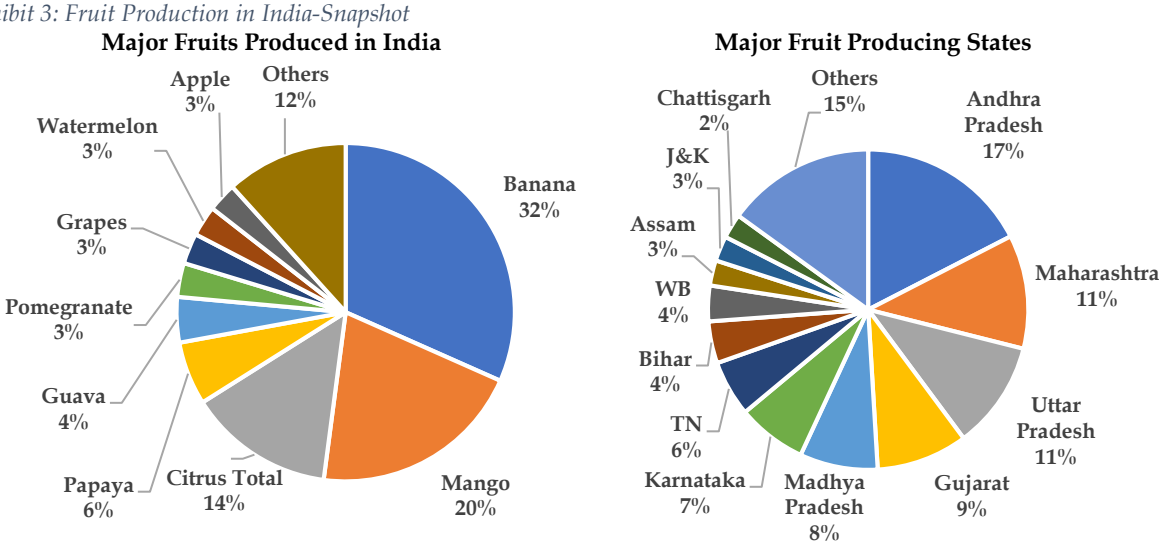


Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India

[1] *In India, Annual Financial Year (FY) calendar starts from 1st April and closes on 31st March. Financial reporting, Indian government production statistics and import figures are reported during this period. In the report, wherever, figures are shown in FY abbreviation, Indian Financial Year is used.*

Major Fruits produced in India are Banana (31.8 million MT), Mango (20.5 million MT), Citrus (14.0 million MT), Papaya (6.1 million MT), Guava (4.4 million MT), Pomegranate (3.3 million MT), Grapes (2.9 million MT) and Watermelon (2.9 million MT). The top five fruit producing states in India are Andhra Pradesh, Maharashtra, Uttar Pradesh, Gujarat and Madhya Pradesh. These five states contribute to ~56% of India's total fruit production.

Exhibit 3: Fruit Production in India-Snapshot



Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare (2019-20)

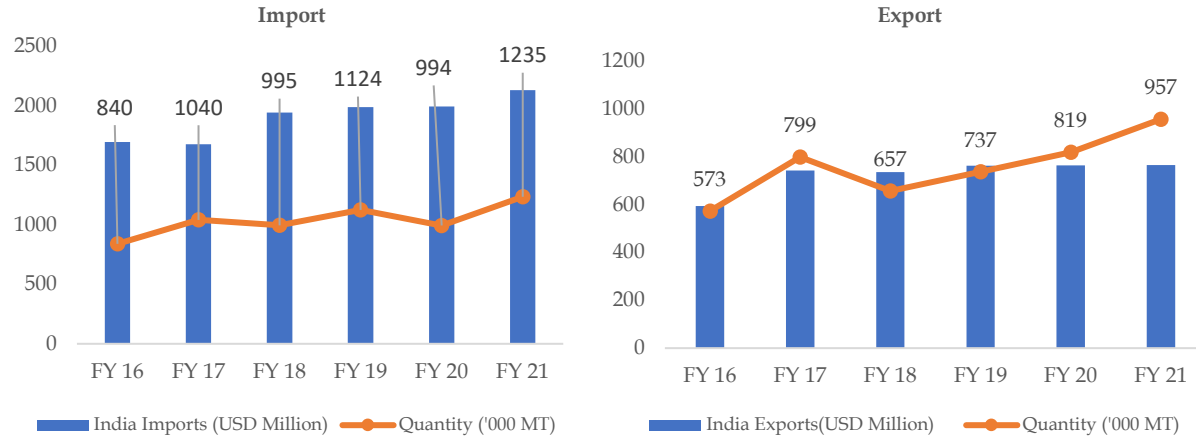
2.2. Trade-Fruit Import in India

2.2.1. Trade Trends

Indian fruit imports reached 1,234.9 thousand MT valued at USD 2,131.2 million in the year 2020-21. India's fruit imports have been growing at a CAGR of 4.7% in terms of value over the last 5 years (FY16 to FY 21).

India's fruit exports in the year 2020-21 was 957 thousand MT, valued at USD 765.6 million. India's fruit exports have witnessed a growth (CAGR) of 5.2% in terms of value over the last 5 years (FY16 TO FY 21).

Exhibit 4: India's Fresh Fruit Import and Export Trends

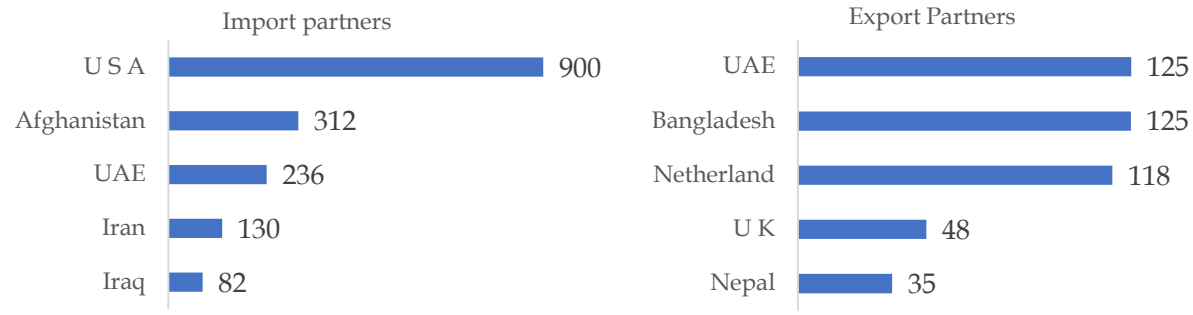


Source: APEDA Trade Exchange

2.2.2. India Fruit Trade-Partners

The major partners for fruit import to India include USA (42%), Afghanistan (15%), UAE (11%), Iran (6%), Chile (3%) and Brazil (2%). Import of fruits from Brazil stood at 7,162 MT, valued at USD 6.66 Mn in FY 21and has been growing at a **CAGR of 56.5% over the last five years till 2020-21.** Major fruit imported **from Brazil is apple.**
The three major export partners for India are UAE (16%), Bangladesh (16%) and Netherlands (15%). Brazil ranks 20th with around USD 6.7 million (0.7%) worth exports from India.

Exhibit 5: Key Import/Export Partners for India in 2020 (values in USD Mn)

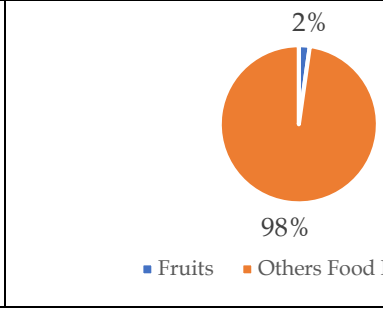
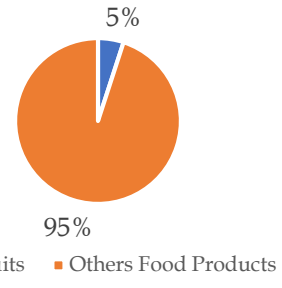


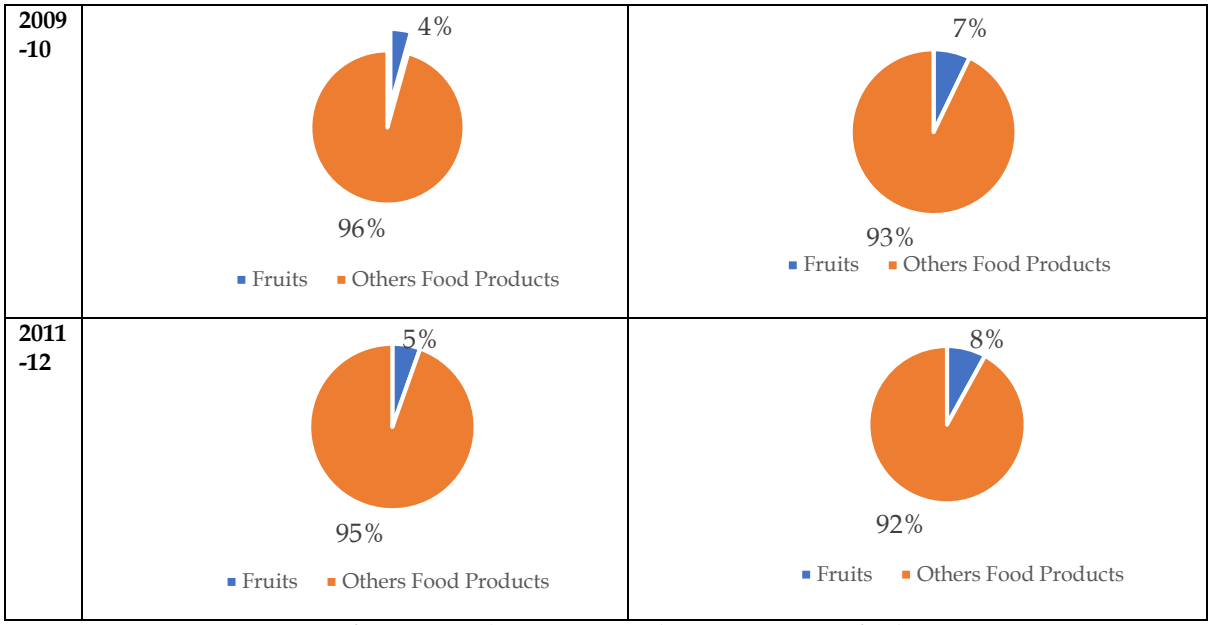
Source: APEDA Trade Exchange

2.3. India's Fruit Consumption

The per capita fruit availability in India is estimated to be 207.9 gms/day which is lower than WHO recommended quantity of 230 gms/capita/day. Fruit consumption in India has been growing in recent years as people have increased their fruit intake due to the underlying health benefits. During the pandemic, an increased consumption of fruits was observed especially for citrus (given its immunity boosting properties).
The long-term trends of food consumption surveys in India, conducted by the National Sample Survey Office (NSSO), Ministry of Statistics and Programme Implementation, Government of India, indicate that the share of fruit consumption expenditure viz a viz food consumption expenditure has been increasing over the years. In rural India, its share has increased from 2% to 5% and in urban India the increase has been from 5% to 8% (between FY95-FY12).

Exhibit 6: Monthly per Capita Expenditure for Fruits and Food Products- Trends

	Rural India	Urban India
1994 -95		



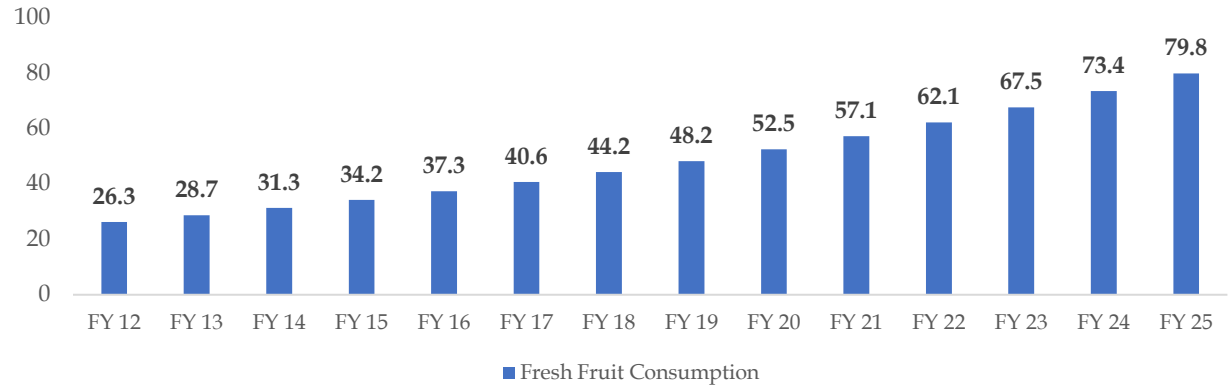
Source: NSSO Surveys, Ministry of Statistics and Programme Implementation, Govt. of India

2.3.1. India's Fruit Consumption Projections

Based on the surveys conducted by the NSSO, projections have been made till FY25 for Fruit consumption in India. The two key assumptions considered for these projections include-, growth rate (CAGR) of 7.5% for fruit consumption and increase in population as per past growth of population in India. The base data for these NSSO surveys is FY12, and projections have been made FY13 onwards till FY25 with the CAGR of 7.5% (as the growth shown over the last survey). The growth rate is expected to be higher than 7.5%, however, in absence of any authentic data we have assumed the same growth rate.

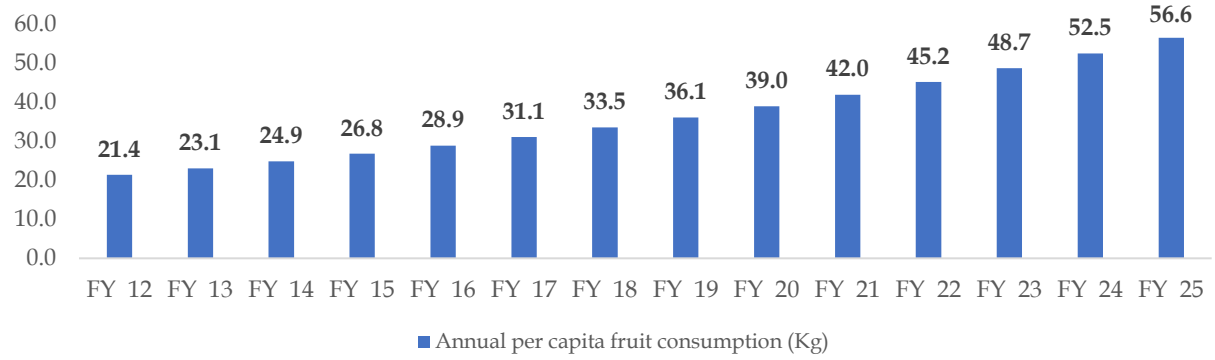
The total fruit consumption in India is projected to reach 79.8 million MT by FY25. The per capita annual fruit consumption is expected to increase to around 57 kg in FY25 from the present ~45 kg (FY 22). The contribution of fruit to total food consumption is also expected to increase to around 12.4% (FY 25) from present 10.6% (FY 22).

Exhibit 7: India's Total Fruit Consumption Projections (million MT)



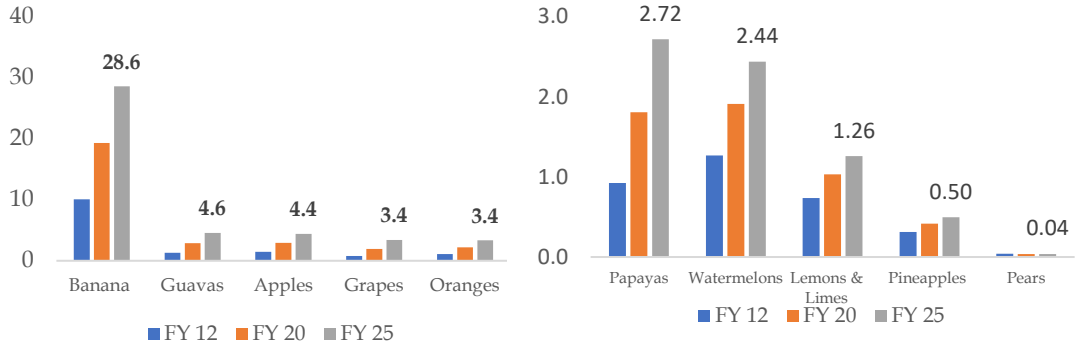
Source: NSSO Surveys 2009-10 (NSSO 66 round) and 2011-12 (NSS 68 round latest), YES Bank Analysis

Exhibit 8: India's Annual Per Capita Fruit Consumption Projections (Kg)



Source: NSSO Surveys 2009-10 (NSSO 66 round) and 2011-12 (NSS 68 round latest), YES Bank Analysis

Exhibit 9: India's Consumption Projections for Key Fruits (million MT)



Source: NSSO Surveys 2009-10 (NSSO 66 round) and 2011-12 (NSS 68 round latest), YES Bank Analysis

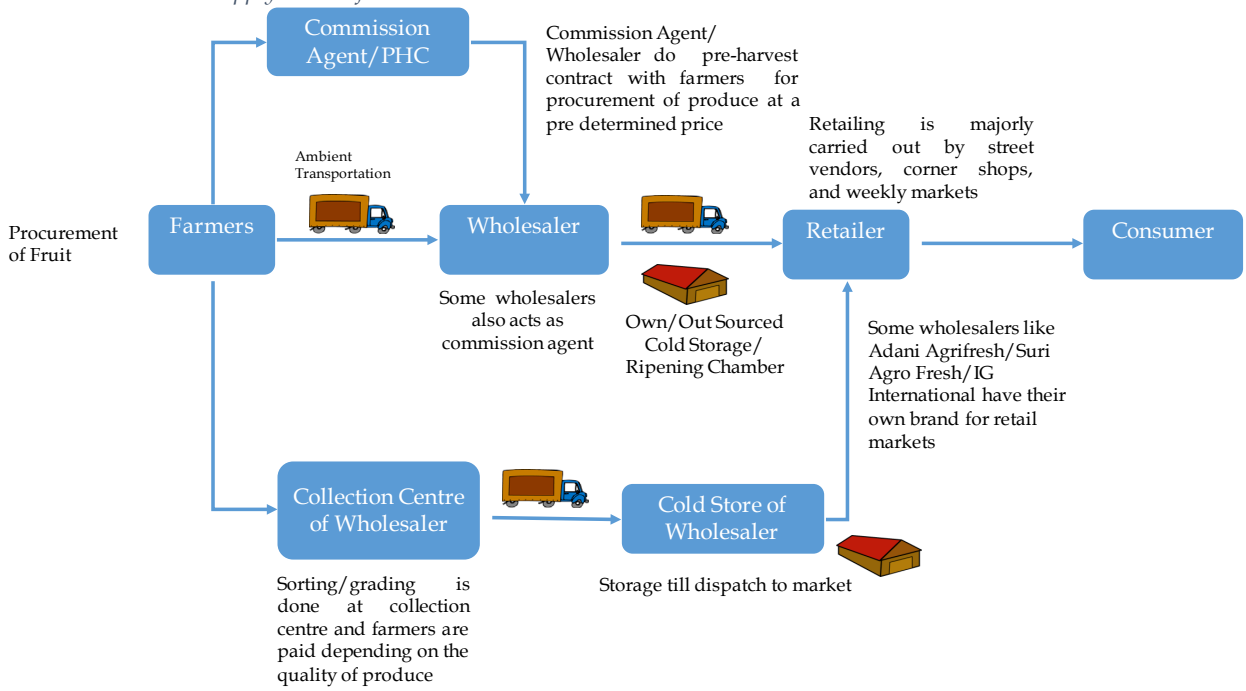
2.4. Supply Chain of Fruits in India

Indian fruit supply chain is majorly un-organized, which is the key reason for high fruit wastage in the country. As per industry sources, modern organized retail trade at present is around 15-20% of the overall retail industry. In consumer F&V basket in India, as per industry estimates, ~55% is constituted by fruits and 45% by vegetables. As per industry estimates, imported fruits cater to around 40% of Indian fruit demand in modern trade. Although, there is presence of modern trade, the supply chain for fruits is not fully integrated with back-end farms. The major actors in the supply chain of fruits and their roles are highlighted in the segment below:

1. **Pre-Harvest Contractors (PHCs):** The orchard owner leases out his orchard as per contract to the PHCs. The PHCs visit the orchards just after the harvesting season to survey the orchards after which the negotiation takes place between the grower and the contractor. PHCs then again visit orchards during the flowering stage and estimate the output for the forthcoming harvesting season. PHCs take care of all post-harvest activities and sell the produce to wholesalers.
2. **Village Traders/Commission Agents:** Most of the fruit growers transact through village traders/commission agents (VT/CA). VTs often provide advance to the farmers with the condition that the growers must sell his produce through them. The VCs/CAs sell fruits to wholesalers/ processing units/retailers.

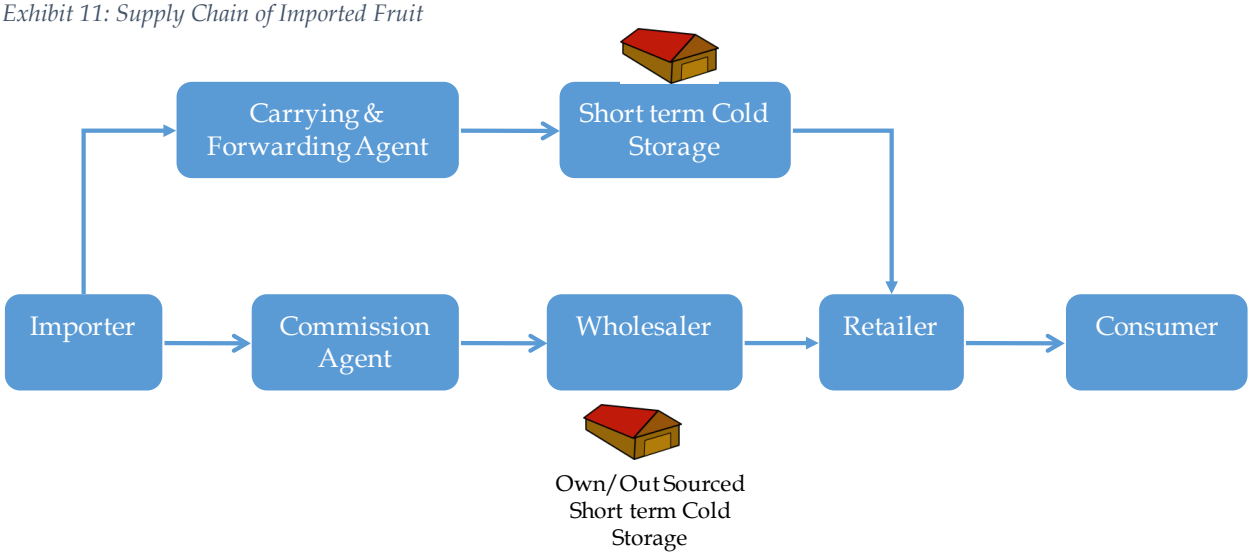
3. **Wholesalers:** Traders from various parts of India participate in fruit trading. Unlike the PHCs, the wholesalers generally do not undertake maintenance of the farm. Under an informal agreement, distributors/ wholesalers pay an advance (10-20%) to the orchard owner for securing the produce.
4. **Processing Units:** Processors purchase fruit for the production of pulp from traders as well as growers. Processors determine the price after analyzing the orchards and also offer advance to the growers. Processing units also purchase fruit from market yards *(mandis)* as they are assured of large quantities.
5. **Retailer:** The retailer is the point of contact with the final consumer of the produce and bears the cost of local transportation and marketing of the produce. He also bears the risk of losses due to quality deterioration and marketing of the produce. These risks are factored appropriately in the retail prices to cover potential losses.

Exhibit 10: Domestic Supply Chain of Fruits in India



Source: YES Bank Analysis

Exhibit 11: Supply Chain of Imported Fruit



Source: YES Bank Analysis

Exhibit 12: Trade Mark Ups

Landing Cost of Fruit (Sea Transport for Apple, Citrus, Pear)	Pear: INR 2700/2800/box (box: 12.5kg) Apple : 3600-3700/box(box: 18 kg) Kiwi: 1700/box (box: 54 pcs) Plum : 700/box (box: 5kg) Litchi: 2200-2300/box (box: 10 kg) Avocado: 1800/box (box: 4 kg)
Loading/Unloading of Vehicle	1000/vehicle
Storage Cost	INR 30/box/month
Shrink/Wastage at importer level	5% 2-3% wastage is accepted in sea transportation
Commissions of Distributor/Modern Trade	5%
Importer Profit Margin	10%
Retailer Profit Margin	15-20%
Average Price for Consumer	Consider 500/box on the Landing cost
Sea Freight from Brazil to India (average prices)	**40 Feet Container-** USD 15,000 (It used to be USD 5,500 on an average, but due to Covid/container issue prices have shot almost three times) **20 Feet Container**-USD 12,000

Source: Market Survey

2.5. Key Import Varieties

Exhibit 13: Key Varieties of Imported Fruits in India

Fruit	Key Varieties
Apple	Washington, Royal gala, Red delicious, Green, Queen, Rose apple, Pink lady, Fuji
Pear	Packham, Green beauty, Red beauty, Anjou pear (red and green from USA – which are less preferred)
Orange	Novels and Valencias
Grapes	Black seedless
Kiwi	Gold, Green

Source: Market Survey

3. Selected Crop Wise Analysis

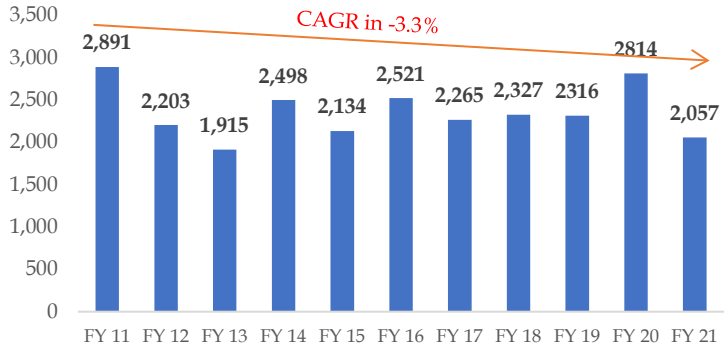
3.1. APPLE (080810)

3.1.1. Production

As per NHB estimates, India's apple production in FY 21 was 2,057 thousand MT. The production has been on a declining trend witnessing a de-growth (CAGR) of -3.3% over the last decade (FY11-FY21). India's share in the global apple production is merely 1.8% (FAO-2019). India's average apple productivity is 7.52 MT/ha, which is much lower when compared to global average productivity of 16.5 MT/ha (Global Best-*New Zealand 56.7 MT/ha; Brazil 37.7 MT/ha*). India's share in the global apple imports was 2.6% in the year 2020, while its ranking in world imports was 13.

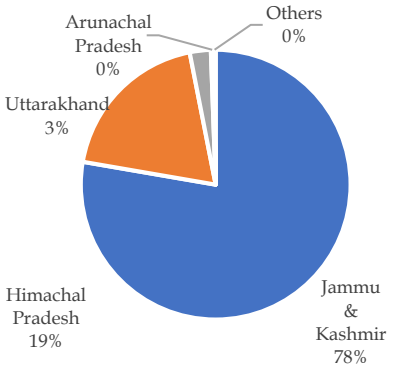
The major apple growing states in India are Jammu Kashmir (78%), Himachal Pradesh (19%) and Uttarakhand (3%).

Exhibit 14: Production Trend over last 10 years (000 MT)



Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India

Exhibit 15: Major States for Apple Production (000 MT)



Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India

The month of August and September are the peak months of apple supply in the market as during these months apple is harvested in Jammu and Kashmir (J&K) and Himachal Pradesh (which account for over 90% of the total production in the country).

Exhibit 16: Harvesting Season

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
J&K							*L*	*L*	*P*	*P*	*L*	
HP						*L*	*L*	*P*	*P*	*L*	*L*	
UK							*P*	*P*	*L*			

Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India (Peak-P, Lean-L)

The major apple varieties grown in India are as follows:

Exhibit 17: Major Apple Varieties Grown in India

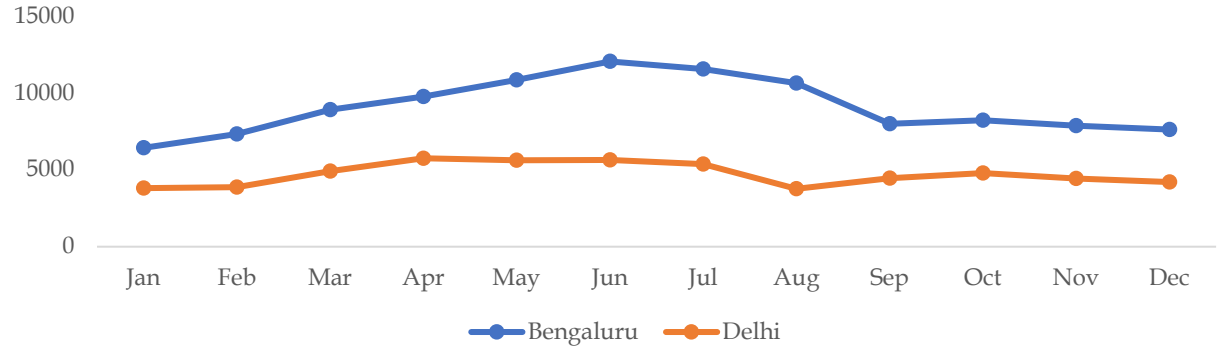
Category		Varieties Grown
Clonal rootstocks	-	M 9, M 26, M7, MM 106, MM 11

Scab resistant	-	Prima, Priscilla, Sir Prize, Jonafree, Florina, Macfree, Nova Easy Grow, Coop 12, Coop 13 (Redfree), Nova Mac, Liberty, Freedom, Firdous, Shireen
Hybrids	-	Lal Ambri (Red Delicious x Ambri), Sunehari (Ambri x Golden Delicious), Chaubattia Princess, Chaubattia Anupam (Early Shanburry x Red Delicious), Ambred (Red Delicious x Ambri), Ambrich (Richared x Ambri), Ambroyal (Starking Delicious x Ambri)
Low Chilling	-	Michal, Schlomit, Anna, Tamma, Vered, Neomi, Tropical Beauty, Parlin's Beauty

Source: National Horticulture Board (NHB), Ministry of Agriculture and Farmers Welfare, Govt. of India

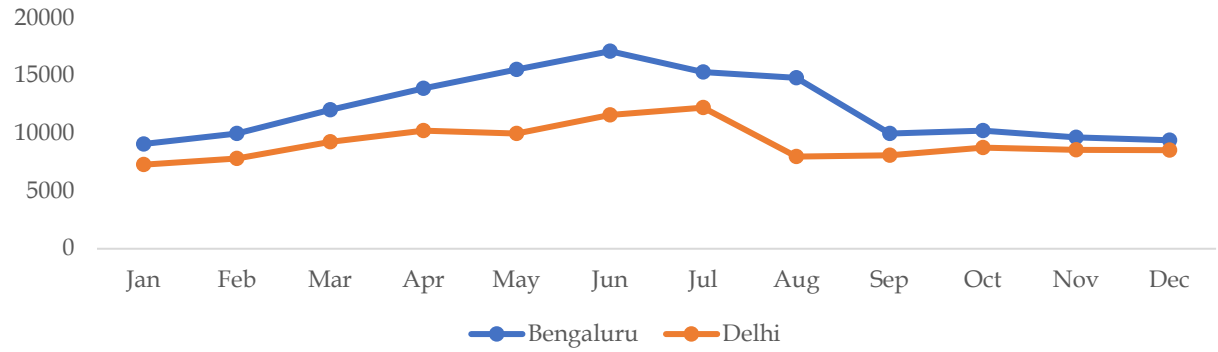
Once the harvesting of apple is at its peak during Aug/Sept, the price in the market tends to drop due to increased arrivals.

Exhibit 18: Wholesale Price Trends for Apple in 2018 (JK-Delicious) in Bengaluru and Delhi (INR/100kg)



Source: National Horticulture Board (NHB), Ministry of Agriculture and Farmers Welfare, Govt. of India

Exhibit 19: Retail Price Trends for Apple in 2018 (JK-Delicious) in Bengaluru and Delhi (INR/100kg)



Source: National Horticulture Board (NHB), Ministry of Agriculture and Farmers Welfare, Govt. of India

3.1.2. Apple Trade

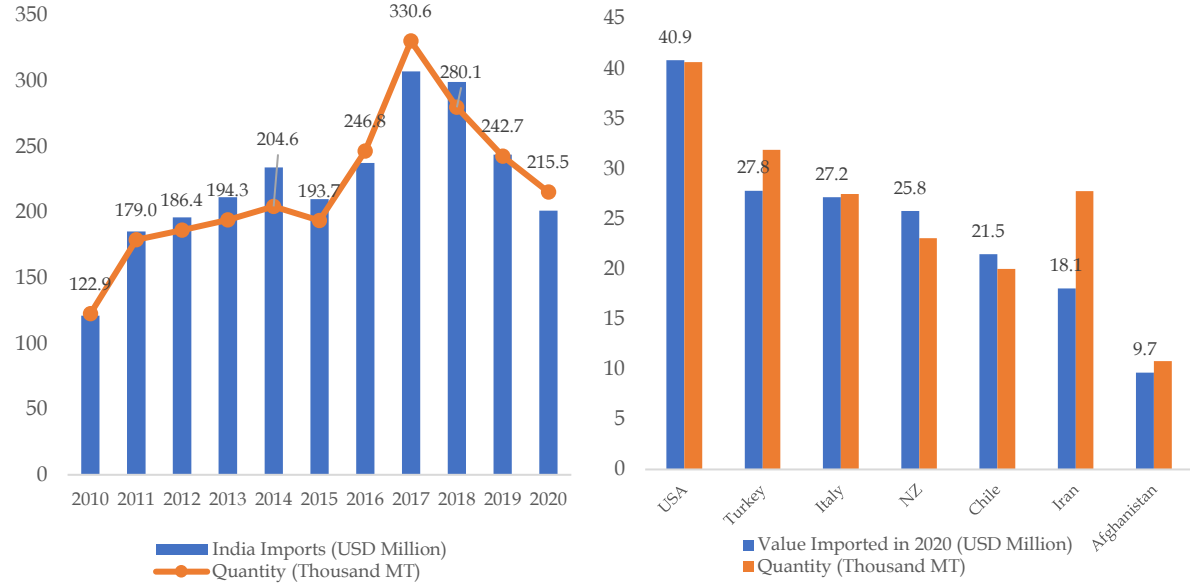
India imported around 201.3 thousand MT of apple in the year 2020, with the major import partners being USA (20.3%), Turkey (13.8%), Italy (13.5%), New Zealand (12.8%), Chile (12.7%) and Iran (9.0%). India's apple imports have witnessed a growth (CAGR) of 5.2% in value terms and 5.8% in volume terms over the last decade (2010-2020).

Brazil is the 9th largest trade partner for apple import to India. Value of apple imports from Brazil have grown at a CAGR of 57% between 2015 and 2020, as compared to 231% for Turkey,

97.9% for Poland and de-growth of -18.6% for USA. Imports from Turkey, Poland and Brazil have been growing and contribution of major supplier USA is decreasing.

There is a significant increase in apple imports from Brazil in 2021, and India has become number one destination for Brazilian apple exporters, followed by Bangladesh. Apple imports in 2021 increased to USD 17 million from USD 6 million in 2020. As per discussion with importers from India this is just beginning, and potential for imports from Brazil is immense.

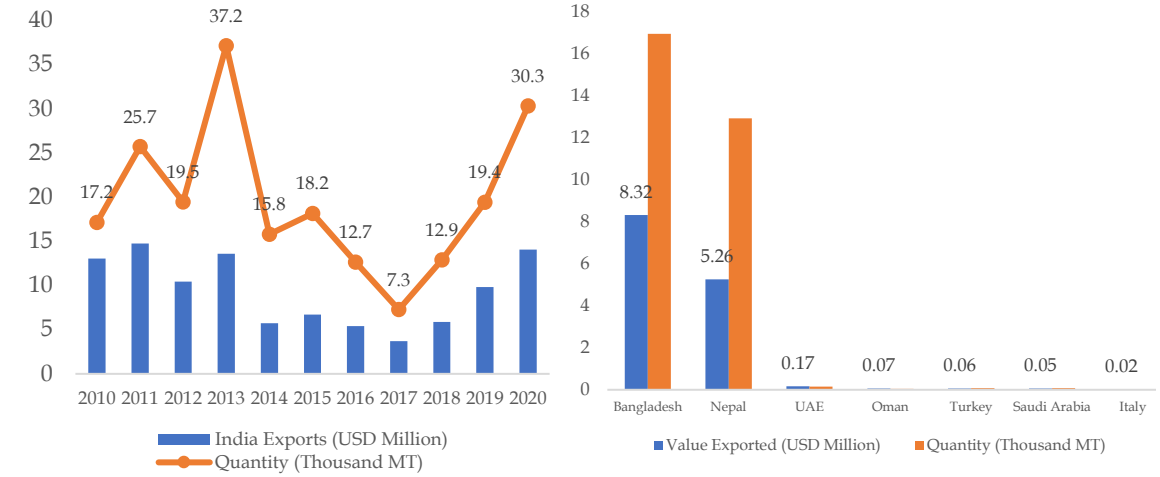
Exhibit 20: India's Apple Import Trend and Major Import Partners



Source: ITC Trade Map

India exports minimal quantity of apples. In 2020, India's apple exports stood at 30.35 thousand MT, worth USD 14.07 million. The major markets include the neighboring countries of Bangladesh (59%) and Nepal (37%). There has been a significant growth in apple exports from India, with exports witnessing a CAGR of 16% in value terms and 10.8% in volume terms between 2015 and 2020.

Exhibit 21: Indian Apple Exports Trend and Major Export Partners

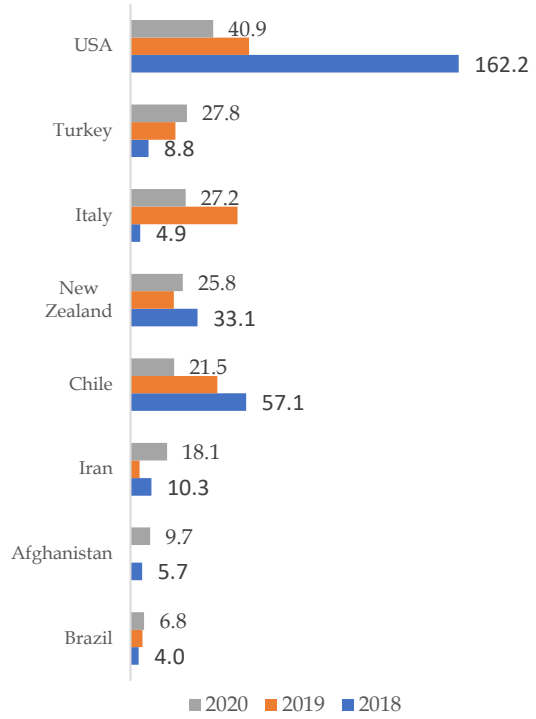


Source: ITC Trade Map

3.1.3. Trade Partners

The major partners exporting apples to India are USA (20.3%), Turkey (13.8%), Italy (13.5%), New Zealand (12.8%) Chile (10.7%), Iran (9%), Afghanistan (4.8%) and Brazil (3.4%). In recent years imports from Turkey, Iran and Brazil have been growing and contribution of major supplier USA is decreasing.

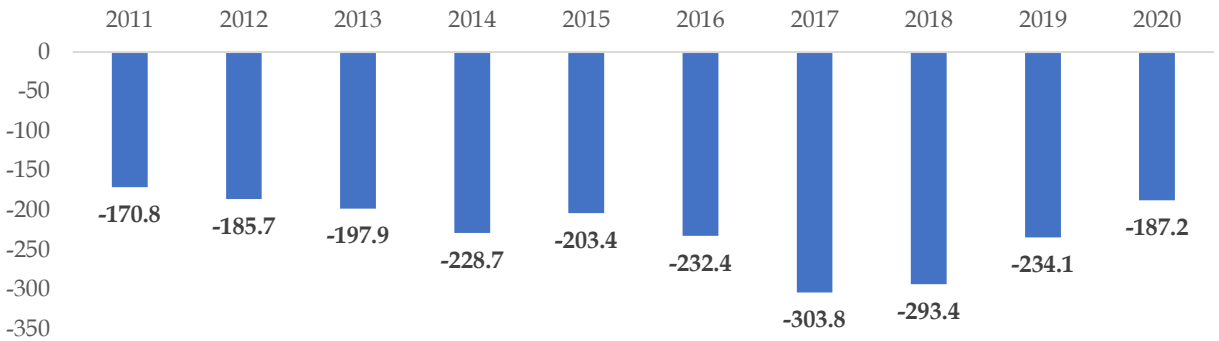
Exhibit 22: Major Countries Exporting to India (Value in million USD)



	CAGR (Last five years till 2020)	Percent Share to Indian Apple Imports in 2020	Country Percent to Global Trade Country 2020	Rank to Global Apple Export 2020	Landed Price of Apple in 2020 (USD/ MT)
USA	-18.6%	20.3%	11.7%	Rank: 3	1005
Turkey	231%	13.8%	1.5%	Rank: 13	872
Italy	-18.2%	13.5%	13.2%	Rank: 2	988
New Zealand	6.3%	12.8%	8.1%	Rank: 4	1118
Chile	0.7%	10.7%	7.8%	Rank: 5	1072
Iran	47.9%	9.0%	0.5%	Rank: 24	651
Afghanistan	36.4%	4.8%	0.6%	Rank: 19	894
Brazil	57%	3.4%	0.6%	Rank: 22	978

Source: ITC Trade Map

Exhibit 23: Apple Trade Balance in India (million USD)



Source: ITC Trade Map

3.1.4. Profile of Competition and Value Chain Analysis (Primary Survey)

J&K and Himachal Pradesh accounts for more than 90% of apple production in India. In India, due to inadequate cold chain infrastructure for apples, losses have been estimated in the range of 10-25%. Indian apples face a glut in the harvesting season, and although Controlled Atmosphere (CA) storages have been established, they are not enough to meet the demand during the peak season. The CA storage capacity in India is estimated at 225,000 MT [2](130,000 MT in JK; 60,000 MT in HP,) which is only 10% of the production. CA storage can generally extend the shelf life to 9-12 months, while normal cold storages can extend the shelf life by up to 4-6 months. Major arrivals for apple in India are from August to November. From April to August, imported apple finds an opportunity in Indian market.

CA storages are generally owned by wholesalers, some commission agents and organized players like Adani Agrifresh, Suri Agri, MKC, Devbhumi, Concor etc. who are into apple sourcing/storage and sale of branded apple. In Himachal Pradesh there are two processing plants which are handled by Horticulture Produce Marketing & Processing Corporation (HPMC), HP State Government Undertaking at Parwanoo, Jarol and a leased facility at Jabli. These two processing units have a total processing capacity of 21,000 MT of fresh fruit. HPMC also maintains cold storage facilities with total storage capacity of about 11,500 MT which have been created at key consumer markets like Delhi, Chandigarh etc.

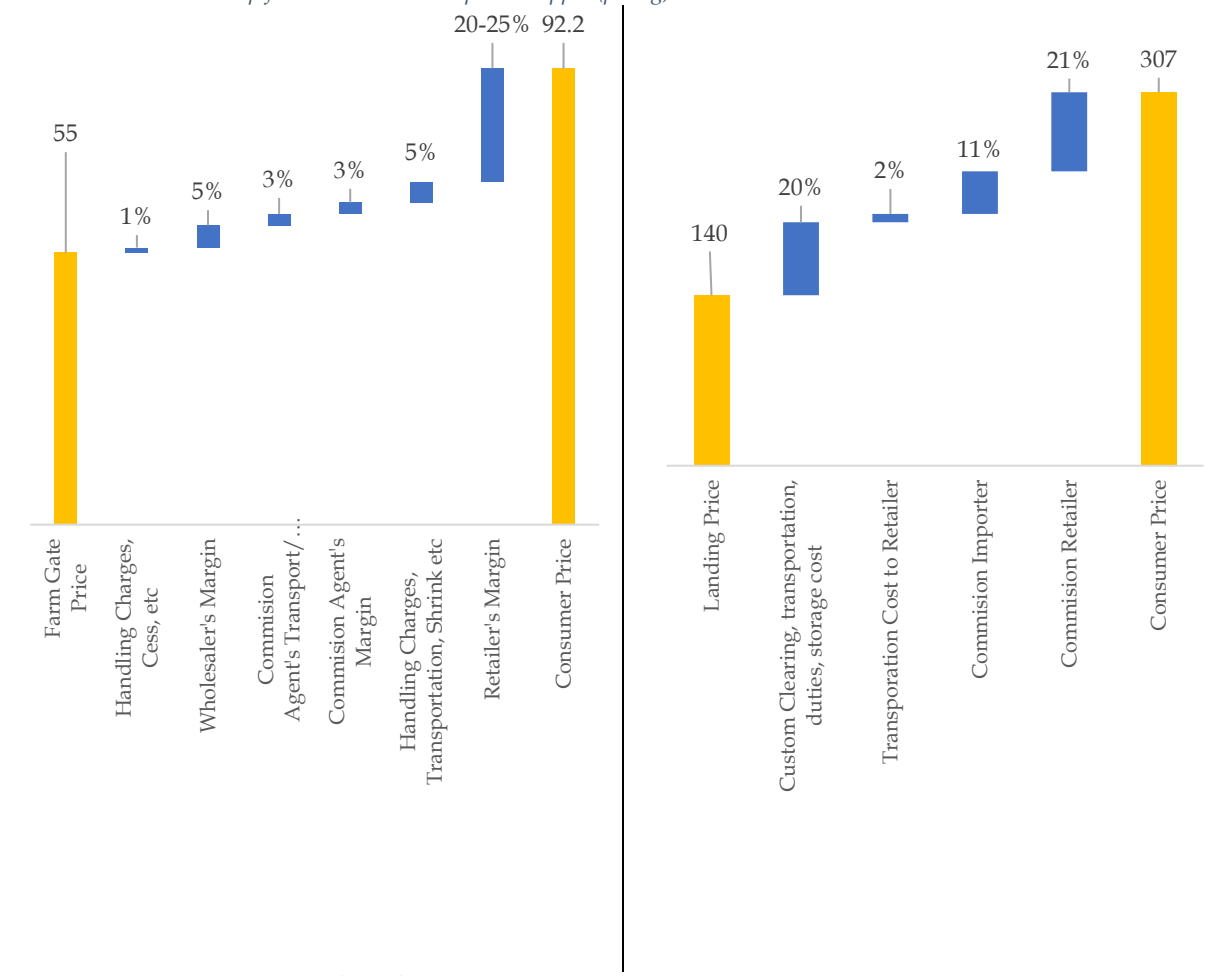
In J&K, Jammu & Kashmir Horticulture Processing and Marketing Corporation (JKHPMC) owns two major processing plants (Sopore and Budgam) with a total annual installed capacity of 70,000 MT to process raw apple.

Apple sales generally takes place through the agriculture markets established and regulated under the state APMC acts. In India, approximately 85-90% is consumed fresh and around 2% in processed into apple juice.

Imported apple come in box packaging of 18-20 kgs or 300 kgs large bins and may be repacked in packs of 4-8 apples. Key imported varieties include Washington Apples, Royal Gala, Fuji, Granny Smith etc. Domestic apples are mainly transported in ambient temperature trucks; however, the larger domestic organized players like Suri AgroFresh, Adani etc. transport apples which are sorted in pack houses in HP and J&K in reefer vans. Imported apples are transported in reefer vans.

[2] *Cold Storage Business Models from Developing Countries, USAID, September 2020*

Exhibit 24: Price Mark Up for Domestic and Imported Apple (per kg)



Source: Primary Survey, YES Bank Analysis

3.1.5. Apple-Phytosanitary Requirements and Potential for Import from Brazil

India allows imports of apples from Brazil under the "The Plant Quarantine (Regulation of Import into India) Order, 2003". The additional declarations required on the phytosanitary certificate are listed below:

Exhibit 25: Phytosanitary requirements

Free from:	
a. Anastrepha fraterculus (South American fruit fly)	**Pre-shipment/ in transit cold treatment at zero degree Celsius (00C) for 40 days. The treatment should be endorsed on Phytosanitary Certificate issued at the country of origin/re-export.**
b. Anastrepha serpentine (Sapodilla fruit fly)	
c. Grapholita molesta (Oriental fruit moth)	
d. Pantomorus cervinus (Fuller"s rose beetle)	
e. Peridroma saucia (Pearly underwing moth)	
f. Phytophthora cryptogea (Tomato foot rot)	
g. Pseudococcus calceolariae (Scarlet mealybug)	
h. Pseudococcus Comstocki (Comstock mealybug)	
i. Pseudomonas viridiflava (Bacterial leaf blight of tomato (USA))	
j. Venturia pyrina (Black spot of pear)	

Source: Plant Quarantine (Regulation of Import into India) Order, 2003

Potential for Import in India-Apple

High opportunity to cater to off-season demand of India from March to August. Import from Brazil has been growing in India, and Brazil being a major exporter can cement significant market share in Indian apple imports.

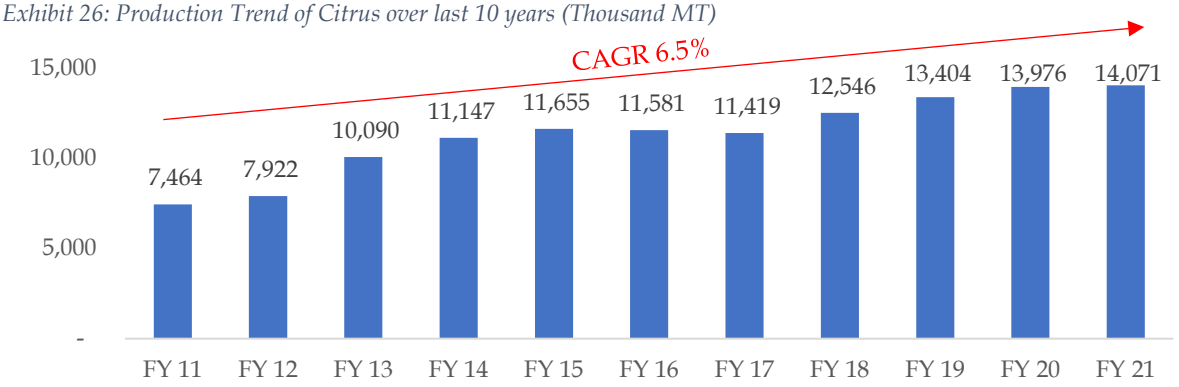
Major drivers for growth would be to negotiate in transit cold treatment of apple within the transit route which is followed as of now which takes a longer time of 50-55 days (as against of cold treatment maximum of 40 days). Direct shipments to India will significantly boost the trade and currently being imported from SE countries.

3.2. Citrus Category (080510 – Oranges, 080521 - Mandarins (Including Tangerines and Satsumas) 080550 - Lemons and Limes)

3.2.1. Citrus Production

India's citrus production during 2020-21 was estimated at 14,071 thousand MT and has been growing at a CAGR of 6.5% over the last 10 years (FY'11-FY'21). India is the third largest producer of citrus in the world with a share of 7.1% in global citrus production (FAO 2019). India's average citrus productivity in 2020-21 was 13.2 MT/ha, which was higher than the global average productivity of 10.4 MT/ha (Global Best-*South Africa 42.6 MT/ha; China 32.7 MT/ha*). India's share in citrus imports was 0.2% in the year 2020 and its ranking in world imports was 56.

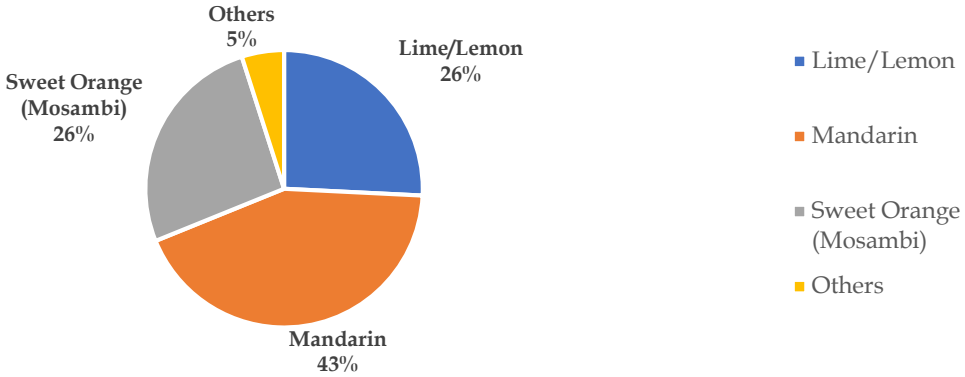
Exhibit 26: Production Trend of Citrus over last 10 years (Thousand MT)



Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India

Major citrus fruits grown in India are Mandarin, Lime/Lemon and Sweet Orange (*Mausambi*). The major citrus growing states in India are Andhra Pradesh, Maharashtra, Punjab, MP and Gujarat.

Exhibit 27: India's Citrus Production-Share of Key Fruits



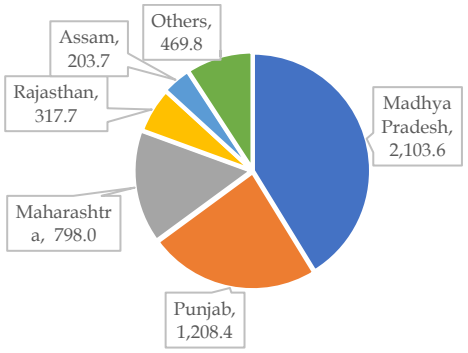
Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India

3.2.2. Mandarin/Orange

India's Mandarin production during 2020-21 was ~6.1 million MT, which has been growing at a CAGR of 11.8% over the last 10 years (FY11- FY21). Major mandarin growing states in India are Madhya Pradesh (41.2%), Punjab (23.7%), Maharashtra (15.6%), Rajasthan (6.2%) and Assam (4.0%).

The winter months (Dec to Jan) and March are the peak months of Mandarin supply in the market as during these months Mandarins are harvested in MP & Punjab (which account for over 65% of India's total production).

Exhibit 28: Major States for Mandarin Production ('000 MT) 2017-18



Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of dia

Exhibit 29: Harvesting Season of Mandarin/Orange

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
MP	P	P	P	L								
Pun	P	L										P
Mah.	L	L	L	P	L	L		L	L	L	L	L	L	L

Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India (Peak-P, Lean-L)

The major Mandarin varieties grown in India are:

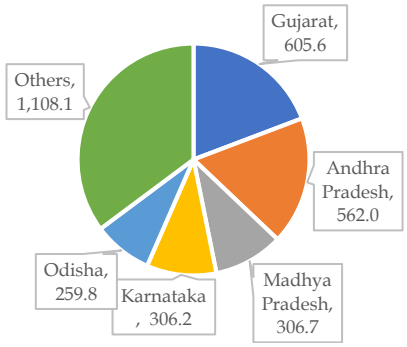
- Coorg Mandarin
- Khasi Mandarin
- Nagpur Mandarin
- Kinnow

3.2.3. Lime/Lemon

India's Lime/Lemon production during 2020-21 was ~3.6 million MT and has been growing at CAGR of 5.6% over the last 10 years (FY11-FY21). Major Lime/Lemon growing states in India are Gujarat (19.2%), Andhra Pradesh (17.9%), Madhya Pradesh (9.7%), Karnataka (9.7%) and Odisha (8.3%).

Harvesting season for top 3 Lime/Lemon producing states are given in the table below.

Exhibit 30: Major States for Lime/Lemon Production 2017-18 ('000 MT)



Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India

Exhibit 31: Harvesting Season of Lime/Lemon

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Guj.								L	P	P	L	
AP	L							L	L	P	P	P
MP		L	L	L	L		P	P	P			

Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India (Peak-P, Lean-L)

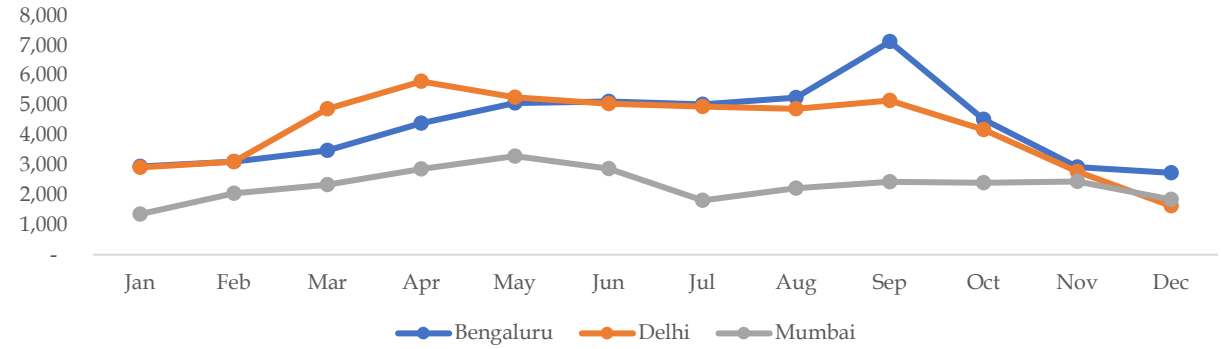
The major Lime/Lemon varieties grown in India are:

Exhibit 32: Varieties of Lime/Lemon Produced in India

	Varieties
Lime	Kagzi Lime, Pramalini, Vikram, Jai Devi, Sai Sharbati, Phule Sharbati, Balaji, Rasraj, Seedless Lime
Lemon	Eureka, Kagzi Kalan, Assam Lemon, Pant Lemon – 1

Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India

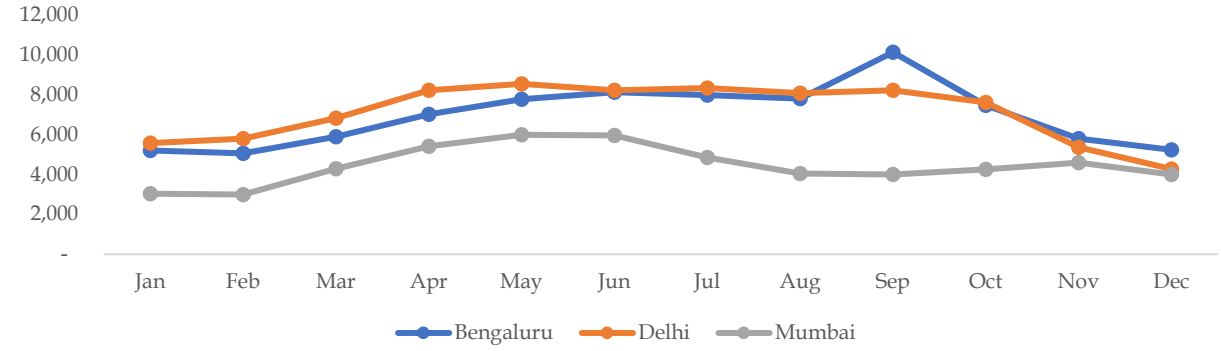
Exhibit 33: Wholesale Price Trends for Lime/Lemon in 2020 in Bengaluru, Delhi, Mumbai (INR/100kg)



Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India

Bengaluru witnessed the highest wholesale and retail price out of the three cities, peaking at INR 71 per kg and INR 101 per kg in September respectively. Lowest prices across the three cities can be seen in the winter months of Nov, Dec, Jan.

Exhibit 34: Retail Price Trends for Lime/Lemon in 2020 in Bengaluru, Delhi, Mumbai (INR/100kg)



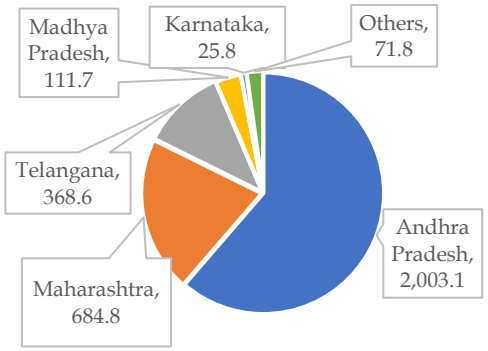
Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India

3.2.4. Sweet Orange (*Mosambi*)

India's Sweet Orange production during 2020-21 was ~ 3.7 million MT which has been growing at a CAGR of 10.9% over the last 10 years (FY11- FY21). Major Sweet Orange growing states in India are Andhra Pradesh (61.3%), Maharashtra (21.0%), Telangana (11.3%), Madhya Pradesh (3.4%) and Karnataka (0.8%).

Harvesting season for Sweet Orange in Andhra Pradesh and Maharashtra which together account for ~82% of the production are given in the table below.

Exhibit 35: Major States for Sweet Orange Production ('000 MT) 2017-18



Source: National Horticulture Board, Ministry of Agricultu Farmers Welfare, Govt. of India

Exhibit 36: Harvesting Season of Sweet Lime

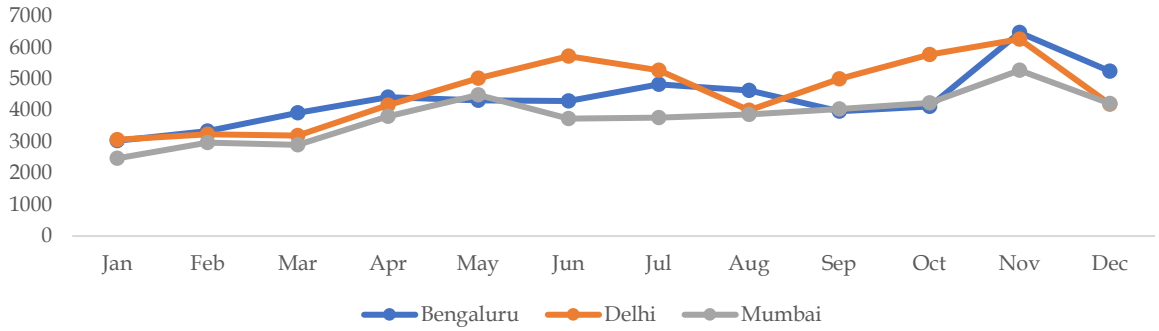
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
AP	P	L	L				*P*		*L*	*L*	*P*	P
Mah.		L	L	P	L				*L*	*P*	*P*	L

Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India (Peak-P, Lean-L)

The major Sweet Orange varieties grown in India are:

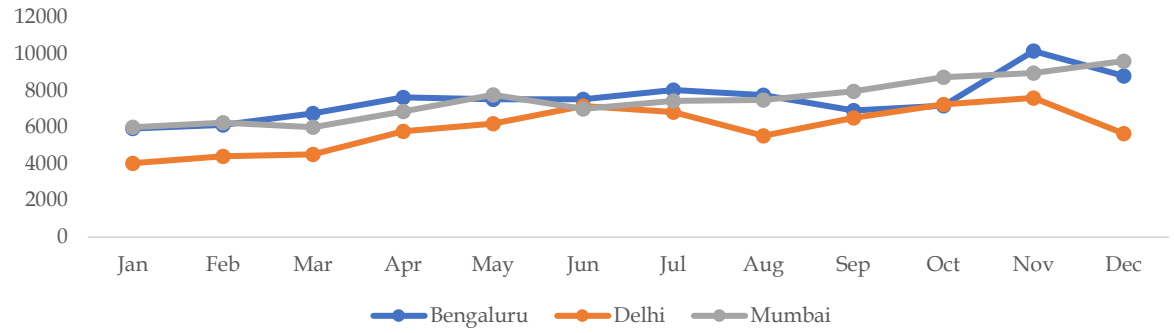
- *Mosambi*
- Satgudi
- Blood Red Malta
- Valencia

Exhibit 37: Wholesale Price Trends for Mosambi in 2019 in Bengaluru, Delhi, Mumbai (INR/100kg)



Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India

Exhibit 38: Retail Price Trends for Mosambi in 2019 in Bengaluru, Delhi, Mumbai (INR/100kg)



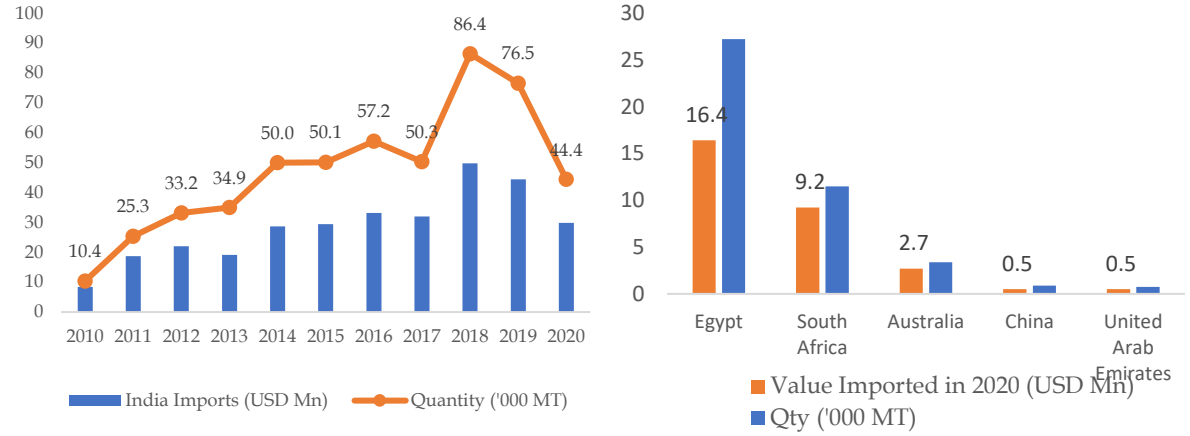
Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India

Bengaluru witnessed the highest wholesale and retail price out of the three cities, peaking at INR 65 per kg and INR 102 per kg in November respectively. Lowest prices can be seen in months of Jan, Feb, March for the three cities.

3.2.5. Citrus Trade

India imported around 44,366 MT of Citrus fruit (fresh or dried) in the year 2020, with major import partners being Egypt (55%), South Africa (30.9%) and Australia (9%). Indian Citrus imports witnessed a CAGR of around 13.5% in value and 15.6% in volume during 2010-2020. Imports from UAE (the 5th largest import partner) grew at a CAGR of 148.5% from 2016, while the largest import partner- Egypt showed a de-growth of -11.7% (value terms) during the same period. Currently, India is not importing citrus fruits from Brazil.

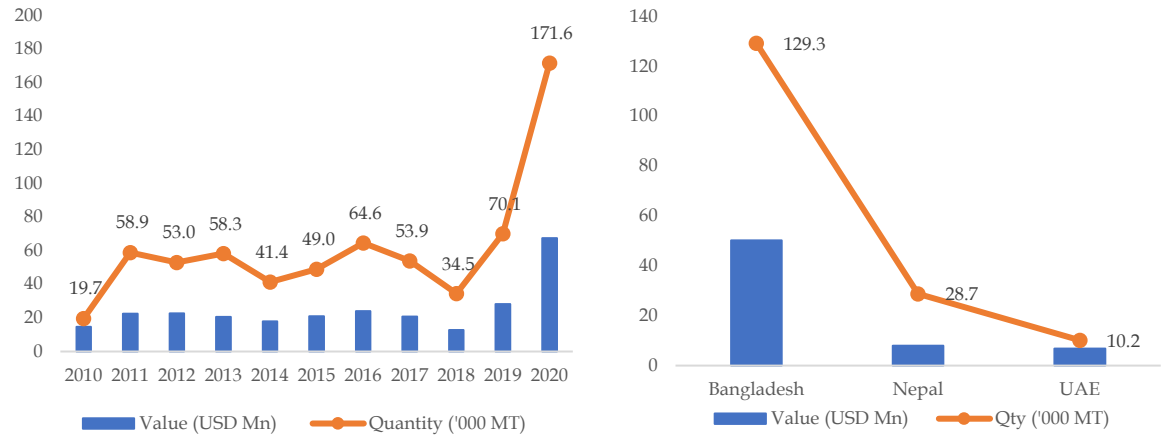
Exhibit 39: India's Import Trends and Major Export Countries for Citrus



Source: ITC Trade Map, YES Bank Analysis

India exported 171.6 thousand MT of Citrus fruits worth USD 67.4 million in 2020. Its share in global exports of citrus fruits (fresh or dried) is 0.4%, giving it a rank 24th. The major markets are neighboring countries of Nepal and Bangladesh. India's citrus exports grew at a CAGR of 16.5% in terms of value during 2010-2020.

Exhibit 40: India's Citrus Exports Trends and Major Importing Countries

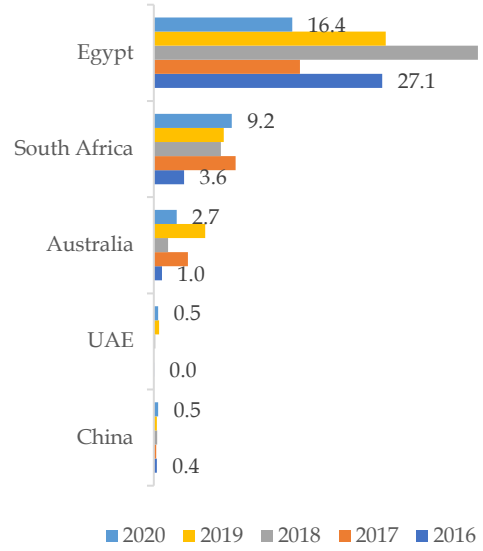


Source: ITC Trade Map

3.2.6. Trade Partners

The major partners for India's Citrus imports are Egypt (55%), South Africa (30.9%), Australia (9%), UAE (1.7%) and China (1.7%).

Exhibit 41: Major Countries Exporting Citrus to India (in USD million)



	Value CAGR (Last five year till 2020)	Share to Indian Citrus Imports -2020	Country percent to Global Trade Country/ Rank to Global Exports	Rank to Global 1 Citrus Export 2020	Landed Price of Citrus in 2020 (USD/MT)
Egypt	11.7%	55.0%	5.0%	Rank: 7	603
South Africa	26.6 %	30.9%	10.7%	Rank: 2	803
Australia	29.1 %	9.0%	2.1%	Rank: 11	796
UAE	148.5 %	1.7%	Negligible	Rank: 77	552
China	7.8%	1.7%	9.9%	Rank: 3	678

Exhibit: ITC Trade Map, YES Bank Analysis

3.2.7. Profile of Competition and Value Chain Analysis (Primary Survey)

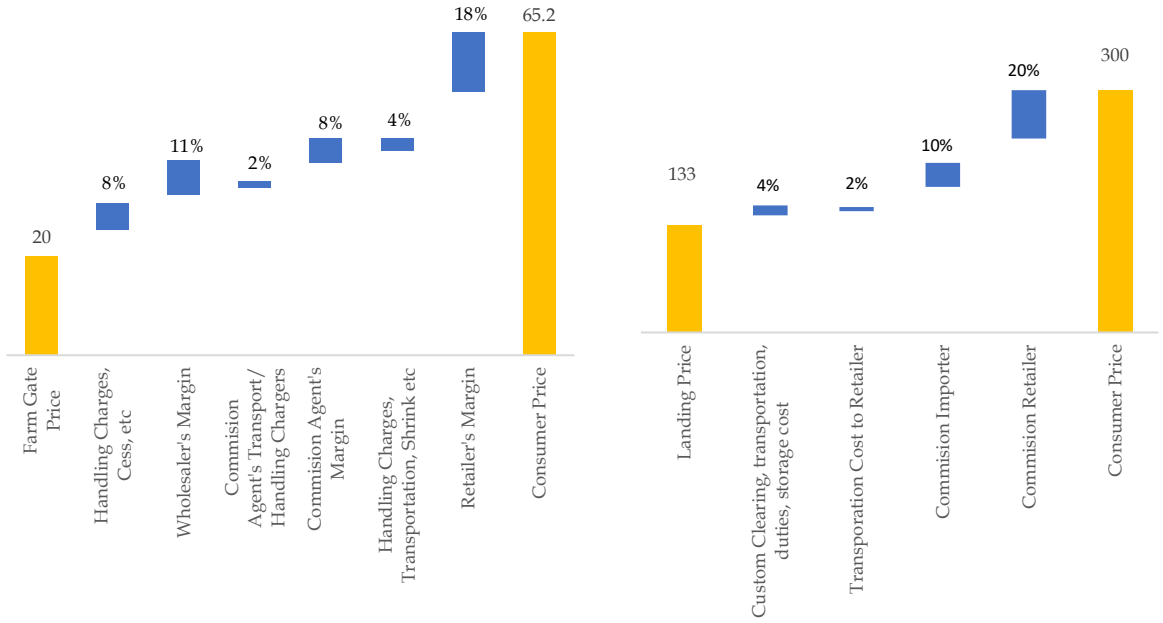
Oranges of variety Novels and Valencia are imported into India majorly from Egypt and South Africa (premium quality). Other exporting nations include, Chile and USA. Imported oranges from Egypt and South Africa are available from Dec end to July and July mid to September respectively. Importers do private label packing for modern retail stores and assorted packing for 4 or 6 pieces is also done for retail sales. Growth of Citrus fruits in India is more for exotic variety.

Majority of the producers sell their mandarin to pre-harvest contractors while a few sell the produce directly to the wholesalers in the market or to processing industries via commission agents. Pre-harvest contractors take orchards on contract before harvesting from farmers at a predetermined price and manage all post-harvest activities themselves. The main reasons for the leasing of orchards to contractors are high risk of spoilage of fruits, no assurance of higher prices in markets, delay in getting payment, high transportation cost and lack of market information. Contractors, after harvest, give the produce to the retailers via commission agents which then reaches the end consumers. Sometimes, producers sell their produce directly to the wholesalers via *mandis*, which is then sold to retailers. This is done by farmers who have convenient access to markets, expectation of higher net margins and small quantities of produce.

Citrus Processing - Beverage industry in India demands about 73,150 MT of Citrus (Orange and Lime) juice equivalent and 65-70% of this demand is presently met through imports. Review of the cost of production indicates that domestic production of fruit juice concentrate across Citrus is not competitive when compared to Brazil (for Orange Juice Concentrate and Argentina (for Lemon Juice Concentrate).

In India, Citrus Processing India Pvt. Ltd. is one of the largest processors for citrus concentrate and its by-products. The plant procures & processes all Citrus fruits domestically available in India, which includes varieties of Nagpur *Santara* (Mandarin), *Mosambi* (sweet lime) and Kinnow. Pepsi Co India is also focusing on developing citrus processing capacity in India.

Exhibit 42: Price Mark Up for Domestic & Imported Citrus Fruit (per Kg)



Source: Primary Survey, YES Bank Analysis

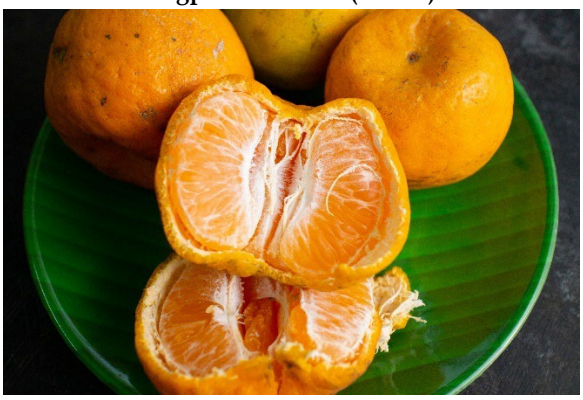
3.2.8. Important Commercial Citrus Fruits of India

Mandarin (Citrus reticulata Blanco)

The commercial cultivars being grown in different regions are 'Nagpur' mandarin (***Santra***) in Maharashtra and Central India; 'Coorg' mandarin in Karnataka and hills of Tamil Nadu and Kerala; 'Khasi' mandarin in north-eastern region; 'Kinnow' mandarin in Punjab, Himachal Pradesh, Haryana, Rajasthan, Western UP, and 'Darjeeling' mandarin in Sikkim and West Bengal.

In North-Western parts of the country, 'Local' mandarin and 'Malta' orange have been mostly replaced by 'Kinnow' mainly because of its response to inputs and consequent higher returns. The 'Nagpur' mandarin established itself well in Central India and its producing centers are Vidarbha region of Maharashtra and other states comprising Madhya Pradesh (key districts- Agar Malwa, Rajgarh, Shajapur, Chhindwara, Mandsaur) and Rajasthan (key districts- Jhalawar and Bhilwara districts).

Nagpur Mandarin (Santra)



Kinnow

Source: Shutterstock.com

Sweet orange (*Citrus sinensis Osbeck*)

The commercial cultivars grown in different regions are 'Mosambi' or 'Musambi' in Maharashtra especially Jalna, Aurangabad, Nanded and Ahmednagar districts; 'Sathgudi' in Andhra Pradesh and Telangana particularly in Nalgonda, Cuddapah, Kurnool and Anantpur districts; 'Hamlin', 'Pineapple', 'Jaffa', 'Valencia Late', 'Blood Red' and 'Malta' in Punjab, Rajasthan and Haryana.

Mosambi

Source: Shutterstock.com

Acid lime (*Citrus aurantifolia Swingle*) and Lemon (*Citrus limon* (L.) *Burm.f*)

The small round and thin skinned 'Kagzi' is the commercial cultivar of acid lime. Lemons are grown commercially only to limited scale in northern and north-eastern States ('Galgal', 'Baramasi' and 'Assam' lemon).

Lemon

Galgal

Source: Shutterstock.com

3.2.9. Citrus-Phytosanitary Requirements and Potential for Import from Brazil

India presently does not allow imports of Citrus fruits from Brazil as per the Plant Quarantine (Regulation of Import into India) Order, 2003. The Ministry of Agriculture, Livestock and Food Supply of Brazil is negotiating process with Indian Ministry of Agriculture and Farmers Welfare and NPPO India on phytosanitary requirements for Citrus.

Potential for Import in India-Citrus

Brazil have a high opportunity to enter Citrus trade in India during the off season. Indian importers have shown interest if there is price parity with other importing countries. Key varieties for India would be Valencias or Novels.

Ministry of Agriculture, Livestock and Food Supply of Brazil is negotiating process with Indian Ministry of Agriculture and Framers Welfare and NPPO India on phytosanitary requirements for Citrus.

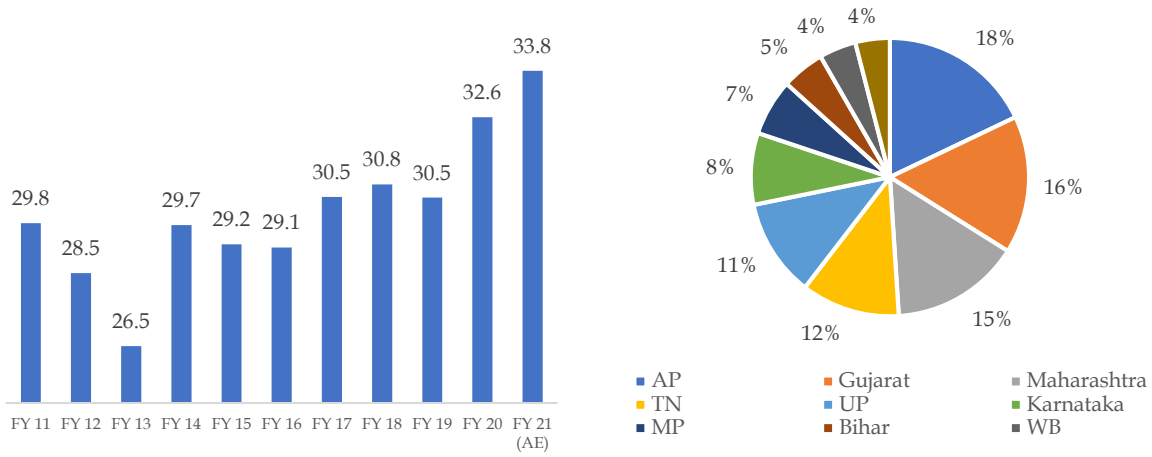
3.3. Banana and Plantains (080390/080310)

3.3.1. Production

The production of banana globally was estimated at 116.78 million MT[3] in the year 2019 which is expected to reach to 132.6 million MT[4] by year 2029. India's banana production in the year 2020-21 (2nd AE) was estimated at 33.8 million MT, which has been growing at a CAGR of 1.3% over the last 10 years (FY11- FY 21)[5]

India is the largest producer of banana globally with a share of ~24%[6]. India's average banana productivity in 2020-21 was 36.9 MT/ha[7], which is higher as compared to global average productivity of 22.6 MT/ha (Global Best-*Turkey 64.6 MT/ha; Nicaragua 62.3 MT/ha*)[8].
The major banana growing states in India are AP, Gujarat, Maharashtra, TN and UP.

Exhibit 43: India's Banana Production Trend over last 10 years (million MT); Major states for Banana Production



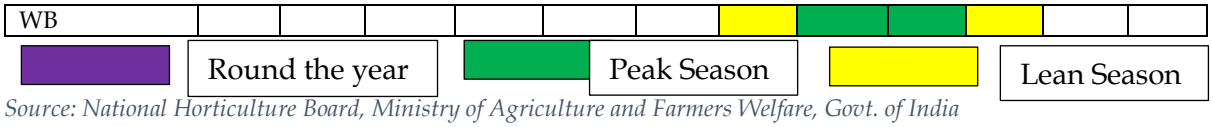
Source: Ministry of Agriculture and Farmers Welfare (2017-18)

In some of the states such as Andhra Pradesh, Arunachal Pradesh, Assam, Goa, Maharashtra, Nagaland, Tamil Nadu and Tripura, Banana is available throughout the year. The month of July to November are the peak months of banana supply in the market as during these months banana is harvested in the eastern and north eastern states of the country.

Exhibit 44: Harvesting Season

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Andhra												
Bihar												
Karnataka												
MP												
Maharashtra												
TN												
UP												

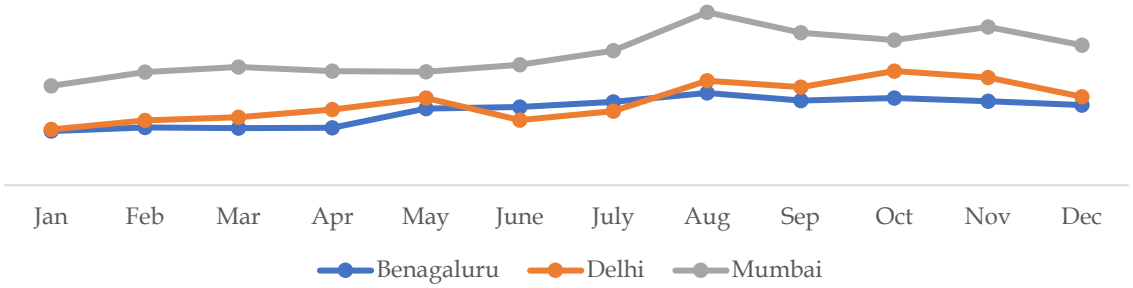
[3] http://www.fao.org/faostat/en/?#data/QC
[4] https://www.oecd-ilibrary.org/sites/217c0794 -en/index.html?itemId=/content/component/217c0794en#section-d1e21870
[5] Ministry of Agriculture and Farmers Welfare, Govt. of India
[6] FAOSTAT-latest available data is for 2019
[7] Ministry of Agriculture and Farmers Welfare, Govt. of India
[8] FAOSTAT- latest available data is for 2019



Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India

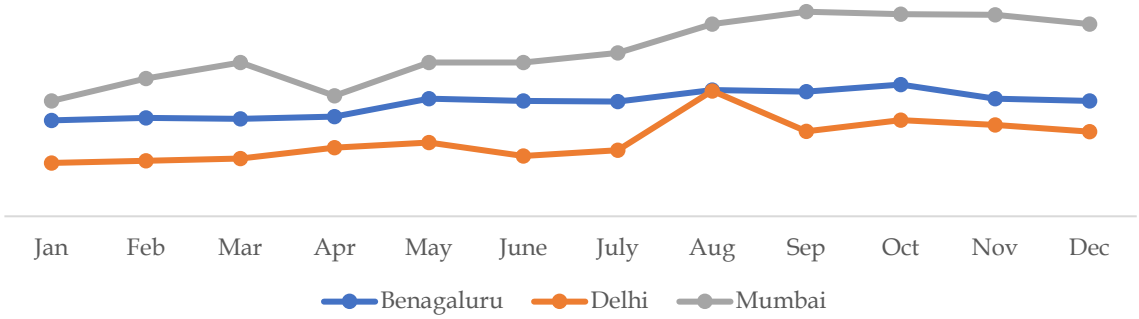
The major banana varieties grown in India are Dwarf Cavendish, Robusta, Grand naine (G9), Rasthali, Poovan, Nendran, Red banana, Monthan and Virupakshi amongst others.
Banana is available in key markets throughout the year with peak arrivals during May to September. The wholesale and retail prices start peaking from May onwards, with Mumbai witnessing the highest prices, almost throughout the year. Peak wholesale price reached about INR 40/Kg, while the highest retail price was close to INR 78/Kg, both of which were witnessed in Mumbai market.

Exhibit 45: Wholesale Price Trends for Banana in 2019 in Bengaluru, Delhi, Mumbai (INR/100 kg)



Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India

Exhibit 46: Retail Price Trends for Banana in 2019 in Bengaluru, Delhi, Mumbai (INR/100 kg)

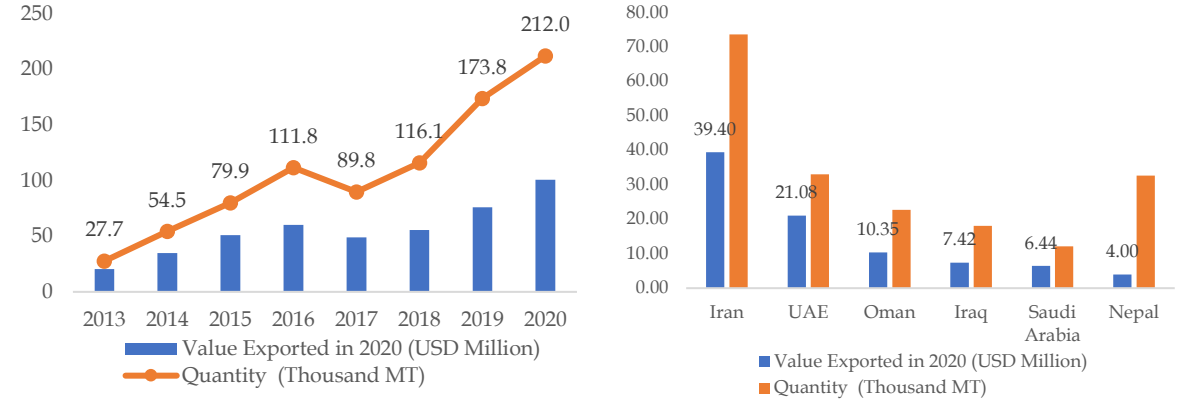


Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India

3.3.2. Banana Trade

India is the largest producer of banana globally and its import of the commodity is negligible. In 2020, India imported only 20 MT (worth USD 12,000) of bananas.
On the export front, India exported 212 thousand MT of bananas worth USD 100 million in 2020. The major markets included Iran, UAE, Oman, Iraq, Saudi Arabia (value terms). The CAGR in value terms for exports of Banana is 14.9% from 2010-2020 and 7.1% from the year 2015-2020

Exhibit 47: India's Banana Exports -Trends and Major Importing Countries



Source: ITC Trade Map

3.3.3. Profile of Competition and Value Chain Analysis (Primary Survey)

More than 70% of the country's banana production is concentrated in 5 states namely- Andhra Pradesh, Gujarat, Maharashtra, Tamil Nadu and Uttar Pradesh. Due to inadequate post-harvest management practices during harvesting, packaging, storage, grading and transportation etc., nearly 20-25% of the fruit is wasted. Proper scientific methods of post-harvest management can minimize losses. Besides post-harvest management, suitable pre-harvest steps such as use of proper harvesting tools and assessment of maturity also improve the shelf life of the fruits and reduce the post-harvest losses to a great extent.

The distribution of bananas from the primary to terminal market is region specific. Banana produced in southern states such as AP, Kerala and TN reach major markets of Bangalore, Mysore, Chennai, Madurai, Vizag, Trichy etc. and is consumed within southern region. Similarly, Banana grown in the states of Maharashtra, Madhya Pradesh and Gujarat reaches North India in the markets of Bhopal, Jaipur, Lucknow and Delhi from where it is distributed to northern states like Himachal Pradesh, Uttarakhand, Jammu & Kashmir, Punjab and Haryana.

There is a constant supply of Indian bananas across all major markets throughout the year. The fruit is a readily available and comes at a price sensitive to the lower income consumer's daily energy needs. Under normal conditions, banana has a shelf life of 6-7 days which makes it a highly perishable fruit crop. As per market sources, 2-3% of the fruit is processed to value added products such as chips, banana powder etc.

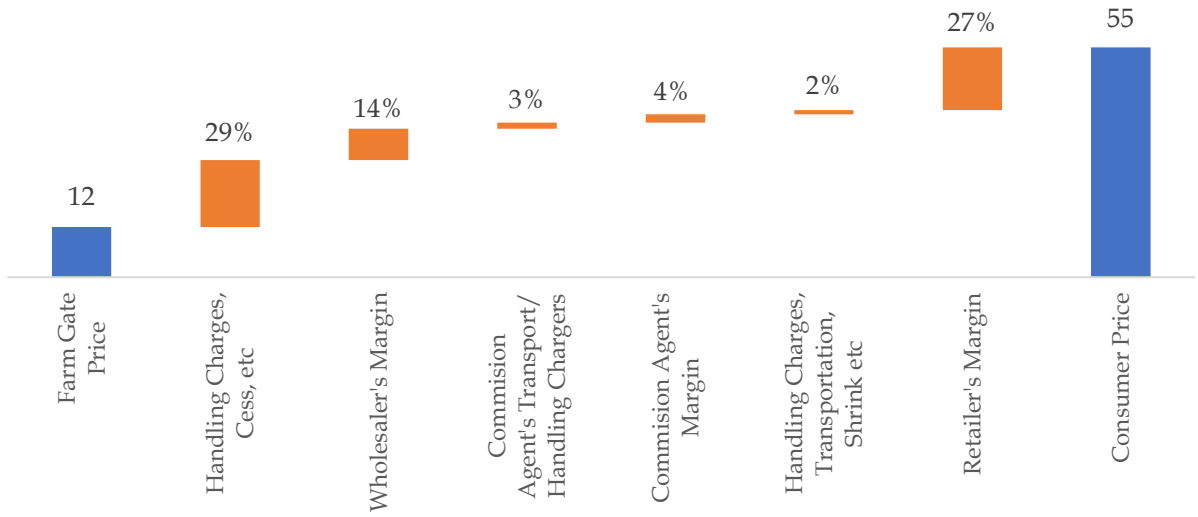
In the conventional supply chain model, fruit is directly sold to pre-harvest contractors who in turn sell to wholesalers. It reaches the end consumers via retailers/ distributors. In modern supply chain, corporates tie up with farmers and procure pre-decided volumes. The entire value addition activities which includes providing farm inputs, fruit care, ambient storage and ripening, packaging and transportation etc. are undertaken by the corporates.

Ripening chambers play a critical role in the post-harvest infrastructure of Banana supply chain. Ripening chambers are owned either by pre-harvest commission agents/ contractors (in conventional supply chain) or by corporates (in modern supply chain). The companies like INI Farms, Desai fruits, Mahindra Greenyard Pvt. Ltd and Sahyadri Farmer Producing

Company are taking keen interest in streamlining the supply chain of the fruit, starting from securing the backend supplies to developing the market in the front end.

Logistics for banana in India: Banana is generally transported in ambient temperature trucks in India, and raw bananas are ripened near the key consumption centres.

Exhibit 48: Price Mark Up for Domestic Banana Fruit (per kg)



Source: Primary Survey, YES Bank Analysis

Import of Banana is negligible in India.

3.3.4. Banana-Phytosanitary Requirements and Potential for Import from Brazil

India presently does not allow imports of Bananas and Plantains from Brazil as per the Plant Quarantine (Regulation of Import into India) Order, 2003.

Potential for Import in India-Banana

Indian production is enough for domestic consumption and production is on an increase to meet the growing demand. Banana and plantains should be of low priority for global exporters, as it will be difficult to be cost competitive in the near term.

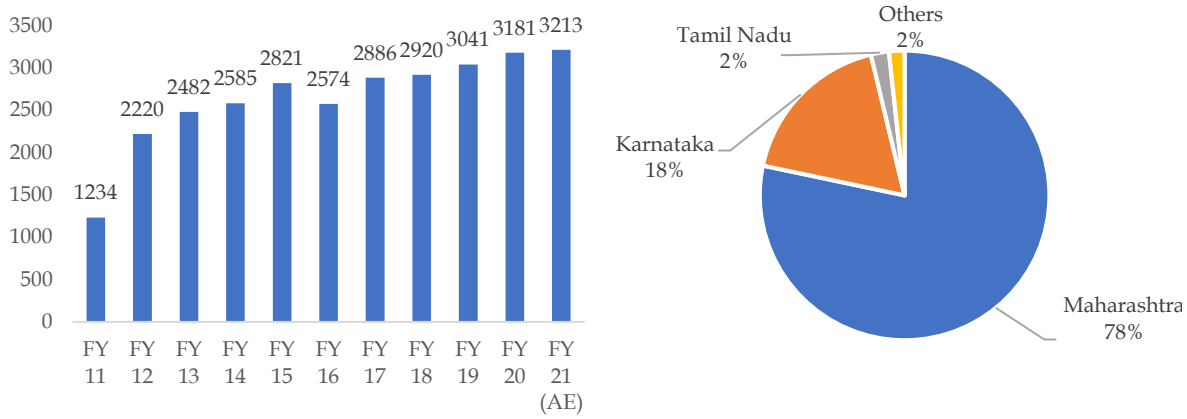
3.4. Grapes (080610)

3.4.1. Grapes Production

India's grapes production in the FY 21 was estimated to be around 3,213 thousand MT, which has been growing with a CAGR of 10% over the last 10 years (FY11-FY21). India's share in the global grapes production is merely 3.3% (FAO 2019). India's average grapes productivity is 21.72 MT/ha as compared to global average productivity of 10.01 MT/ha (Global Best-*China* 32.64 *MT/ha; Brazil 19.90 MT/ha*). India's share in global grapes imports was 0.1% in the year 2020 and its ranking in world imports was 62.

The major grapes growing states in India are Maharashtra, Karnataka and Tamil Nadu.

Exhibit 49: Production Trend over last 10 years (000 MT); Major Production States



Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India

The month of February and March are the peak months of grapes supply in the market as during these month grapes are harvested in Maharashtra (February, March, April and May) and Karnataka (February, March , April and November) (which accounts over 90% of the total production in the country).

Exhibit 50: Major Harvesting Season

State	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Maharashtra												
Karnataka												
AP												
Tamil Nadu												

Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India

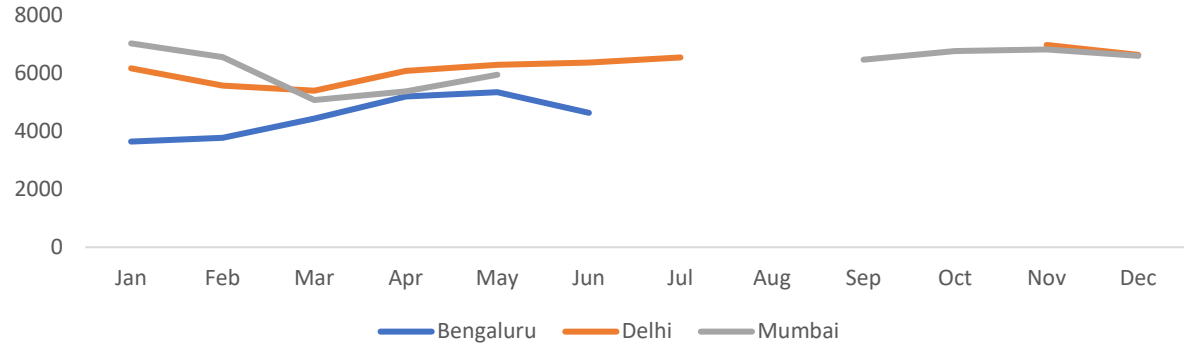
Exhibit 51: Major Grapes Varieties Grown in India

Category	Varieties Grown
Coloured seeded	Bangalore Blue, Gulbi (Muscat)
Coloured seedless	Beauty Seedless and Sharad Seedless, Flame Seedless, Manjri Naveen
White seeded	Anab-e-Shahi, Dilkhush(clone of Anab-e-Shahi)

White seedless	Perlette, Pusa Seedless, Thompson Seedless and its clones Tas-a-Ganesh, Sonaka, Kishmish Rozavis White and Manik Chaman

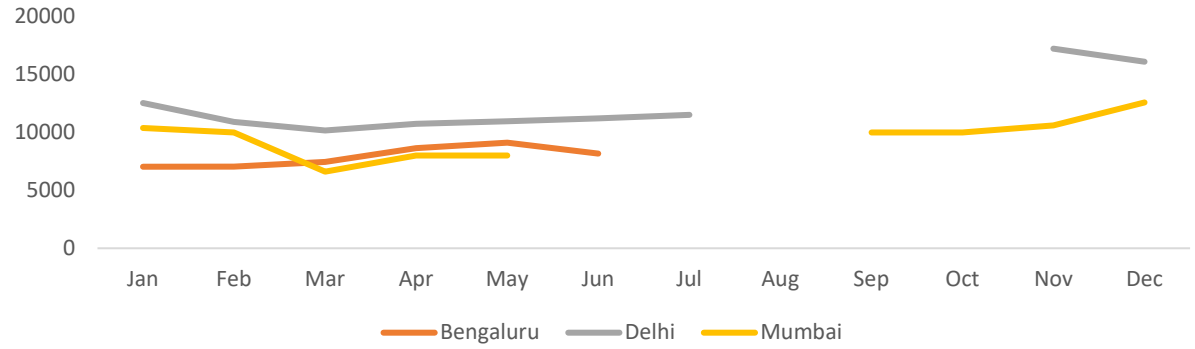
Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India

Exhibit 52: Wholesale Price Trends for Grapes in 2019 (Thomson Seedless) in Bengaluru, Delhi and Mumbai (INR/100kg)



Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India

Exhibit 53: Wholesale Price Trends for Grapes in 2019 (Thomson Seedless) in Bengaluru, Delhi and Mumbai (INR/100kg)

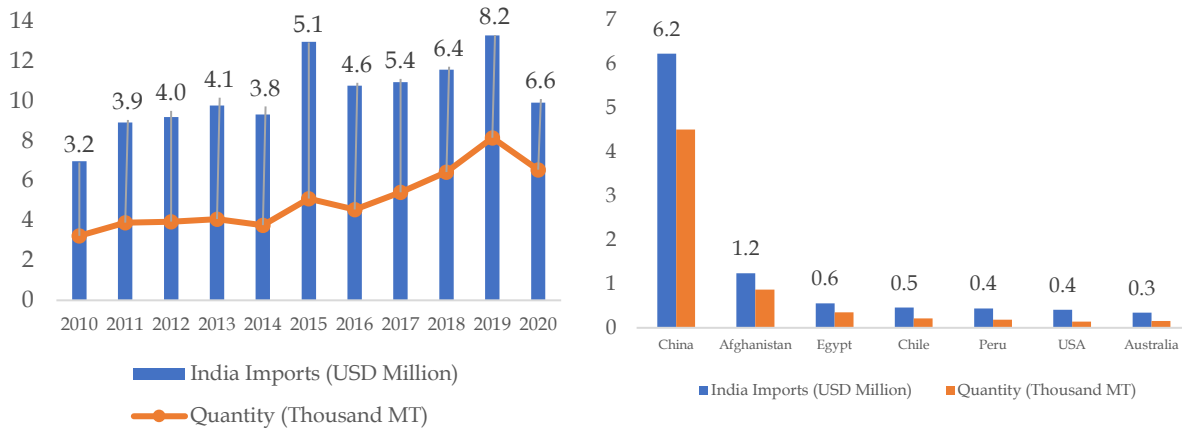


Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India

3.4.2. Grapes Trade

India imported around 6.6 thousand MT of grapes in the year 2020, with the major import partners being China (62.9%), Afghanistan (12.5%), Egypt (5.6%), Chile (4.6%), Peru (4.4%), USA (4.1%) and Australia (3.5%) (in value terms). Indian grapes imports have witnessed a CAGR of 3.6% in value terms and 7.3% in quantity terms over the period 2010-2020. No grapes have been imported from Brazil since 2011 (INR 50 million in 2011). Imports from China (120.7%), Afghanistan (98.7%), Egypt (23.1%) have been growing and Chile (-14.9%), Peru (-30.3%), US (-43%) and Australia (-22.3%) has been degrowing.

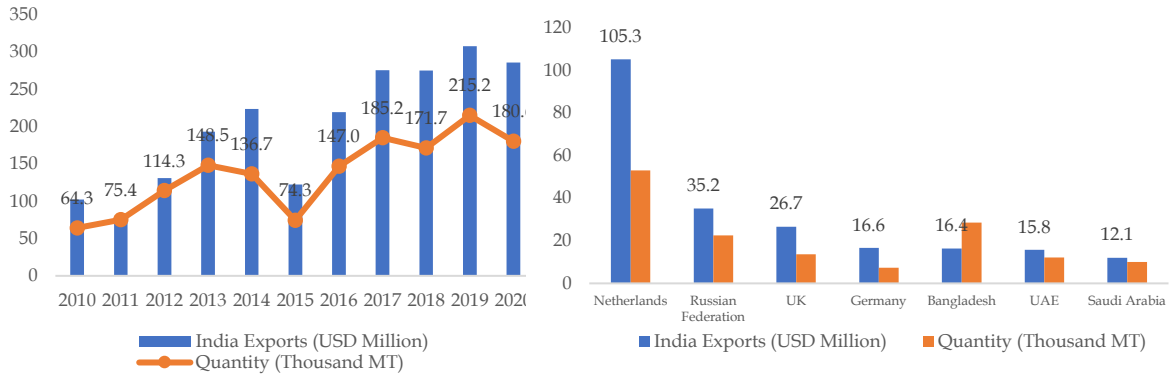
Exhibit 54: India's Grapes Imports Trend and Major Export Partners



Source: ITC Trade Map

India is a significant player in grapes exports and India exported 180.64 thousand MT of grapes worth USD 286.1 million in 2020. Grapes exports value have grown at a CAGR of 10.8% from 2010-2020 and have grown by a CAGR of 18.5% from 2015-20. The major partner countries for India's grapes export are Netherlands (37%), Russia (12%) and UK (9%).

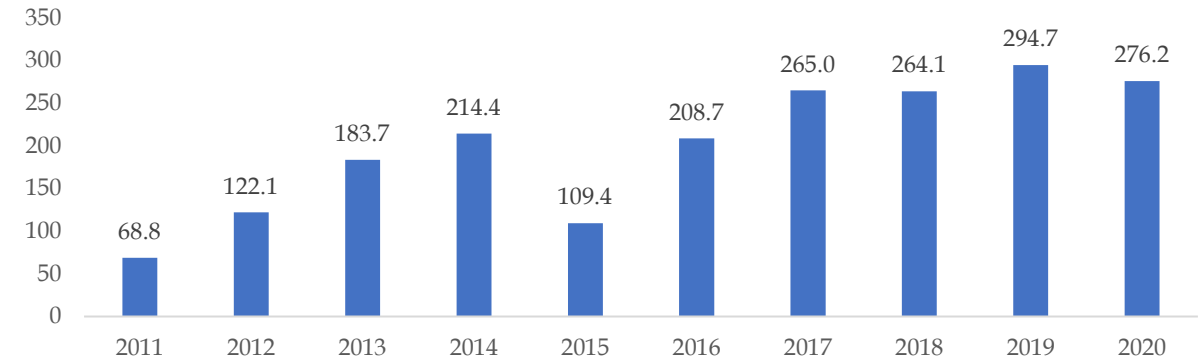
Exhibit 55: India's Grapes Exports Trend and Major Import Countries



Source: ITC Trade Map

India has a positive trade balance with respect to grapes.

Exhibit 56: Grape Trade Balance India (million USD)

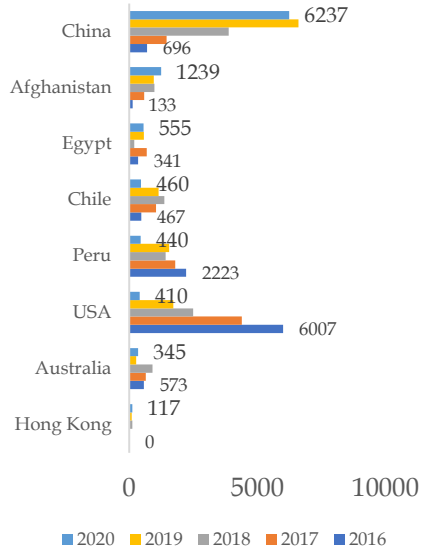


Source: ITC Trade Map

3.4.3. Trade Partners

The major partners exporting grapes into India are China (62.9%), Afghanistan (12.5%), Egypt (5.6%), Chile (4.6%) Peru (4.4%), USA (4.1%) Australia (3.5%) and Hong Kong (1.2%). In recent years imports from China, Afghanistan and Egypt have been growing and contribution of major suppliers like USA and Australia is decreasing.

Exhibit 57: Major Trade Partners for Grapes Imports



	Value CAGR (Last five year till 2020)	Share to Indian Grape Imports-2020	Country percent to Global Trade Country/ Rank to Global Exports	Rank to Global Grape Export 2020	Landed Price of Grape in 2020 (USD/MT)
China	120.7%	62.9%	13.6	Rank:1	1382
Afghanistan	98.7%	12.5%	0.6	Rank:18	1421
Egypt	23.1%	5.6%	2.6	Rank:12	1568
Chile	-14.9%	4.6%	10.3	Rank: 3	2160
Peru	-30.3%	4.4%	11.1	Rank:2	2353
USA	-43.0%	4.1%	9.2	Rank:5	2887
Australia	-22.3%	3.5%	5.1	Rank:9	2184
Hong Kong		1.2%			2208

Source: ITC Trade Map

3.4.4. Profile of Competition and Value Chain Analysis (Primary Survey)

Major grapes producing states in India are Maharashtra, Karnataka and Tamil Nadu. The major production clusters for grapes in Maharashtra are Nashik, Sangli, Ahmednagar, Pune and the main variety grown in Thomson Seedless, Sonaka, Sharad Seedless and Tas-e-Ganesh. Majority of Maharashtra's grape farmers are GlobalGap certified. Harvesting starts from early February to April.

India has achieved a rare feat of export of grapes to developed markets like western Europe and other developed markets. Nashik district in Maharashtra contributes to around 55% of India's and 75% of Maharashtra grapes exports.

Maharashtra government in order to promote grapes exports from the state had formed "Mahagrapes", and the success has been replicated by establishment of other cooperative societies which provide post-harvest support like pre-cooling, cold storage, export assistance etc. Key players exporting grapes from India are Mahindra Shubhlabh, INI Farms, Shayadri Farms etc.

As per market sources, 71% of produce is consumed as fresh (either for domestic/exports), nearly 27% is dried for raisin production, 1.5% for winemaking and 0.5% is used for juice. In India, raisins are mainly produced in Sangli, Solapur and Nashik districts of Maharashtra and Vijayapura and Bagalkot districts of Karnataka.

3.4.5. Grapes-Phytosanitary Requirements and Potential for Import from Brazil

India presently does not allow imports of grapes from Brazil as per the Plant Quarantine (Regulation of Import into India) Order, 2003. The Ministry of Agriculture, Livestock and Food Supply of Brazil is negotiating process with Indian Ministry of Agriculture and Farmers Welfare and NPPO India on phytosanitary requirements for grapes.

Potential for Import in India-Grapes

There is an opportunity to import grapes during the off season and cement market share in this category. Major grape variety imported in India is black seedless.

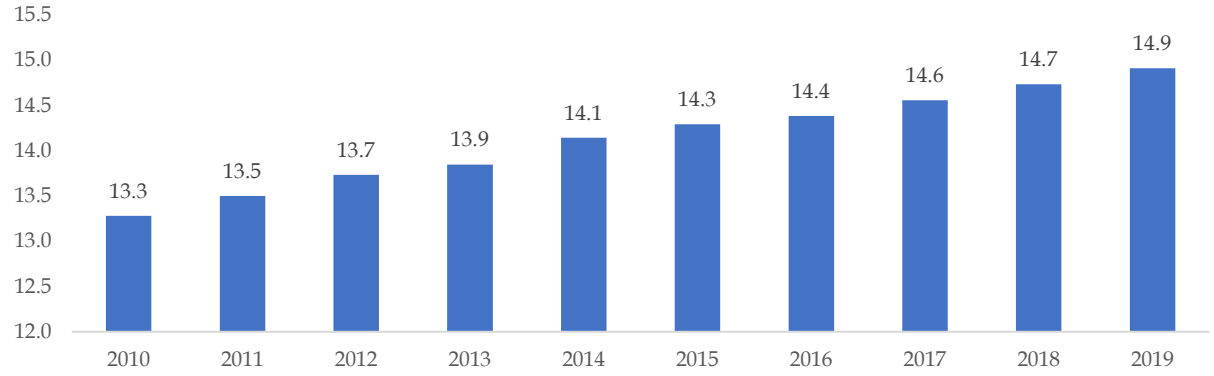
Ministry of Agriculture, Livestock and Food Supply of Brazil is negotiating process with Indian Ministry of Agriculture and Farmers Welfare and NPPO India on phytosanitary requirements for Grapes.

3.5. Fig 080420

3.5.1. Fig Production

India's fig production in FY 19 was 14,914 MT, which has been growing at a CAGR of 1.3% over the last 10 years. India is the 15th largest producer of fig in the world having share of 1.1% in the global fig production. India's average fig productivity is only 2.6 MT/ha as compared to global average productivity of 6.7 MT/ha (Global best – *Uzbekistan – 30.7 MT/ha*). India is the largest importer of figs in the world with a share of 20.5% in global fig imports (2020). The major fig growing states in India are Maharashtra, Gujarat, Uttar Pradesh, Karnataka and Tamil Nadu.

Exhibit 58: Production Trend of Fig over last 10 years (000 MT)



Source: FAOSTAT

The major harvesting season for fig in India for Karnataka is as follows:

Exhibit 59: Harvesting Season of Fig in Karnataka

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	P	P	L	L	L						

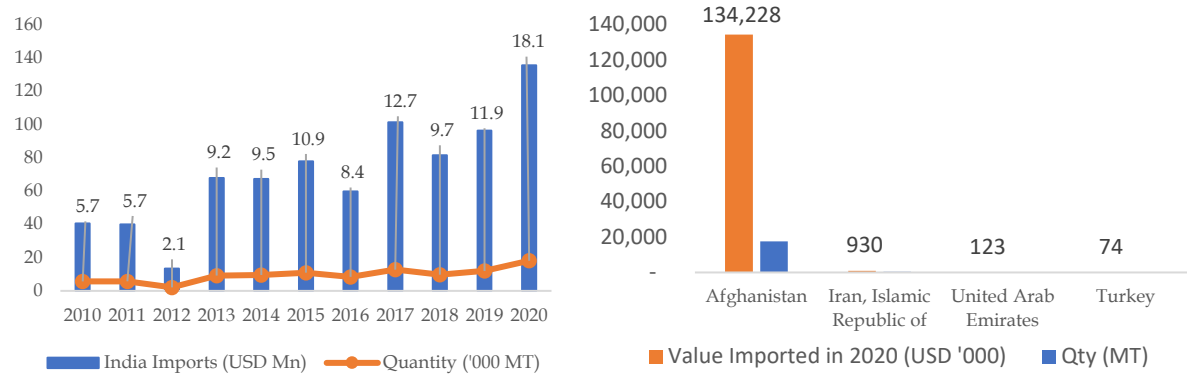
Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India (Peak-P, Lean-L)

In India 'Poona' is the most popular cultivar grown for consumption as fresh fruit. A variety 'Dinkar', an improvement over 'Daulatabad' variety for yield and fruit quality is gaining commercial importance.

3.5.2. Fig Trade

India imported around 18,103 MT of Figs (Fresh or Dried) in the year 2020, with major import partners being Afghanistan (99.2%), Iran (0.7%), UAE (0.1%) and Turkey (0.1%). During last 10 years (2010-2020) India's fig imports have grown at a CAGR of 12.3% in volume terms and 12.8% in value terms.

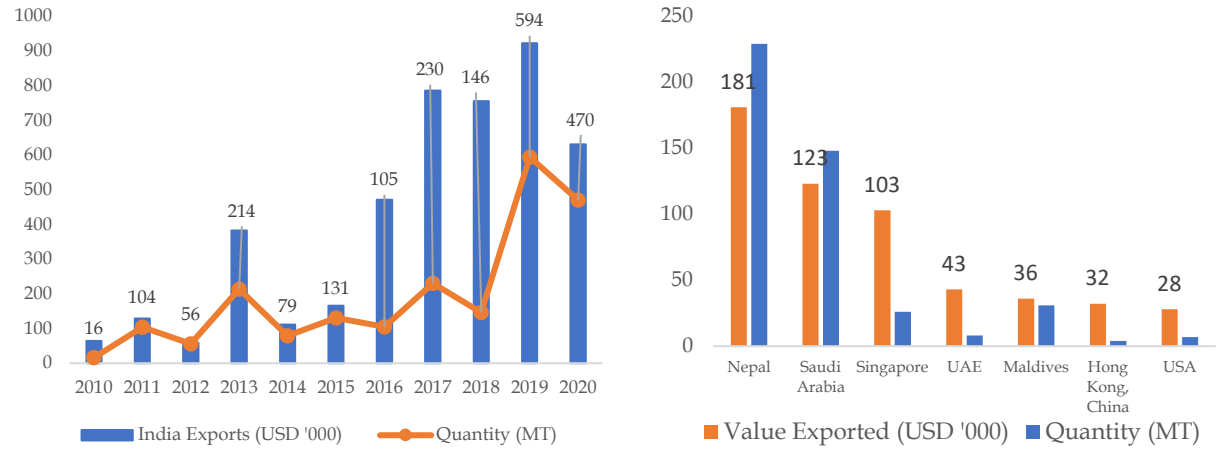
Exhibit 60: India's Import Trends and Major Export Partners for Fig



Source: ITC Trade Map

India's exports represent 0.1% of world exports for fig, and its ranking in world exports is 32. India exported around 470 MT of figs, worth USD 631,000 in 2020. The major export markets for India are Nepal, Saudi Arabia, Singapore, UAE and Maldives. India's fig exports have grown at a CAGR of 29.1% in terms of value during 2010-2020.

Exhibit 61: Indian Fig Exports Trends and Major Importing Countries

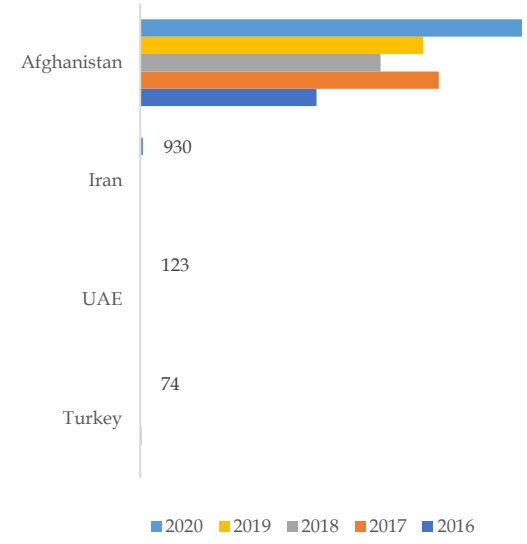


Source: ITC Trade Map

3.5.3. Trade Partners

The major importing partners of India are Afghanistan (99.2%), Iran (0.7%), UAE (0.1%) and Turkey (0.1%).

Exhibit 62: Major Countries Exporting Fig to India (in value terms), Import in USD Thousand



	Value CAGR (Last five year till 2020)	percent Share to Indian Fig Imports- 2020	Country percent to Global Trade Country/ Rank to Global Exports	Rank to Global Fig Export 2020	Landed Price of Fig in 2020 (USD/MT)
Afghanistan	11.7 %	20.3%	21.8%	Rank: 2	7,627
Iran	42.5 %	13.8%	1.1%	Rank: 12	2,612
UAE	110.2 %	13.5%	0.2%	Rank: 27	946
Turkey	34.2 %	12.8%	46.8$	Rank: 1	4,353

Exhibit: ITC Trade Map

3.5.4. Profile of Competition and Value Chain Analysis (Primary Survey)

Figs are grown in India in very small quantities, and the farm gate prices are generally around INR 100/kg, while the retail prices in the regional markets of Karnataka/Andhra Pradesh is INR 200/kg. In the retail market, figs are sold in small punnets of 100-150 gms. Nearly 70% of the figs are consumed domestically, while remaining are exported. Indian figs do not have high shelf life and need to be consumed in a day or two. The landed price of Indian figs in UK is be around UK Pound 7/ kg. India does not import fresh figs for consumption and majority imports are for dried figs *(anjeer)* from Iran/Afghanistan etc. Indian farmers have also tried to dry the figs (*anjeer* manufacturing) but it has achieved little success as compared to these nations as the product quality and recovery in not as high.

3.5.5. Figs-Phytosanitary Requirements and Potential for Import from Brazil

India presently does not allow imports of figs from Brazil as per the Plant Quarantine (Regulation of Import into India) Order, 2003.

Potential for Import in India-Figs

In India, fig is consumed in dried form, and level of acceptance for fresh fruit consumption is low.

Brazil can initially focus on dried fig exports to India if there is price parity for the same as compared to key suppliers (Afghanistan/Iran).

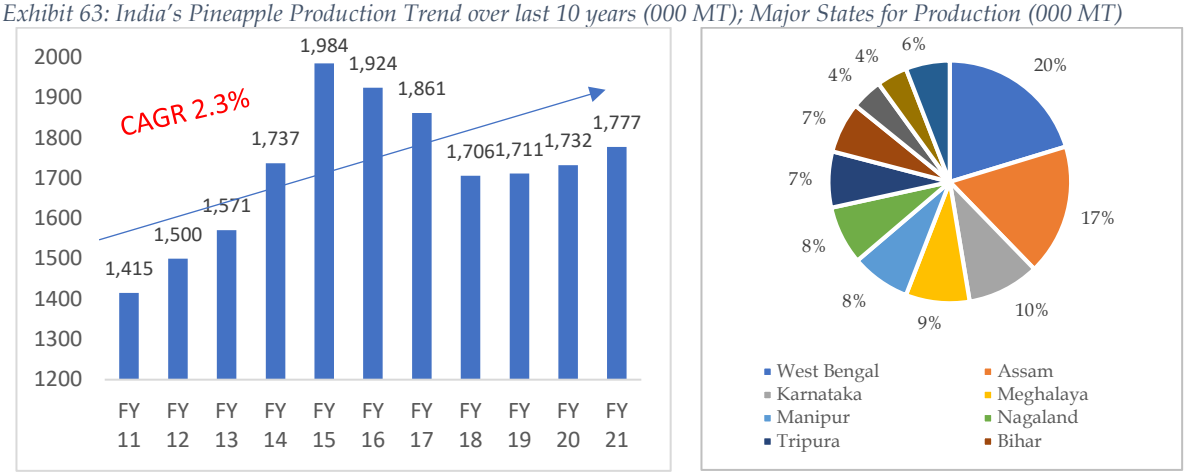
3.6. Pineapple (080430)

3.6.1. Pineapple Production

India's pineapple production in the year 2020-21 was estimated at 1.8 million MT, which has been growing at a CAGR of 2.3% over the last decade (FY11-FY21)[9]. India is the sixth largest producer of pineapples globally with a share of ~6% (FAO 2019). India's average pineapple productivity in 2020-21 was 16.5 MT/ha, which is much lower than the global average productivity of 25 MT/ha (Global Best-*Indonesia 128.3 MT/ha; Costa Rica 83.2 MT/ha; Ghana 68.7 MT/ha*). Owing to India's high production base, its pineapple import is negligible.

The major pineapple growing states in India are West Bengal (20.3%), Assam (17.4%), Karnataka (9.6%), Meghalaya (8.5%) and Manipur (7.9%).

Exhibit 63: India's Pineapple Production Trend over last 10 years (000 MT); Major States for Production (000 MT)



Source: MoA and Farmers Welfare

The month of June July and August are the peak months of pineapple supply in the market as during these months pineapple is harvested across the key production states of West Bengal, Assam, Meghalaya, Manipur, Karnataka etc.

Exhibit 64: Harvesting Seasons

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
WB						*L*	*P*	*P*	*L*	*L*	*L*	
Assam							*P*	*P*	*L*			
Karnataka			*L*	*L*	*L*	*P*	*P*	*P*				
Meghalaya						*L*	*P*					
Manipur					L	*L*	*P*	*P*				

Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India (Peak-P, Lean-L)

[9] Ministry of Agriculture and Farmers Welfare, Govt. of India

The major pineapple varieties grown in India are as follows:

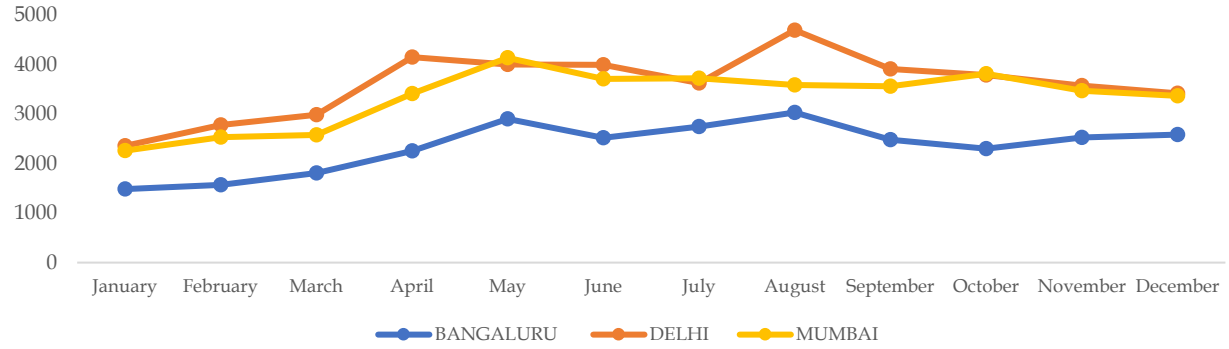
Exhibit 65: Major Pineapple Varieties Grown in India

Category	Varieties Grown
West Bengal	Giant Kew, Queen, Mauritius
NER	Kew, Queen, Mauritius
Kerala	Kew, Queen, Mauritius

Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India

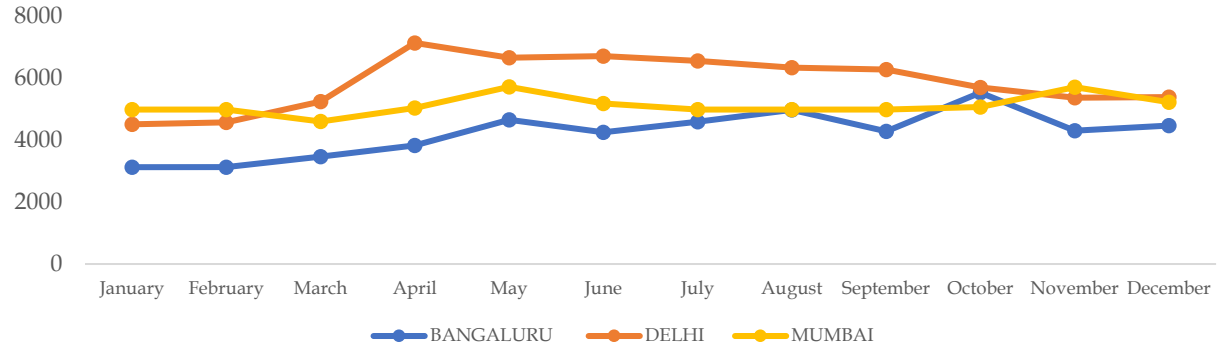
Availability of pineapple in key markets is largely throughout the year with peak arrivals during April to June and August to September. The wholesale and retail prices start peaking from April onwards, with Delhi witnessing the highest prices, almost throughout the year. Peak wholesale price reached about INR 50/Kg, while the highest retail price was close to INR 75/Kg, both of which were witnessed in Delhi market.

Exhibit 66: Wholesale Price Trends for Pineapple in 2019 in Bengaluru, Delhi, Mumbai (INR 100/kg)



Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India

Exhibit 67: Retail Price Trends for Pineapple in 2019 in Bengaluru, Delhi, Mumbai, Kolkata (INR/100kg)



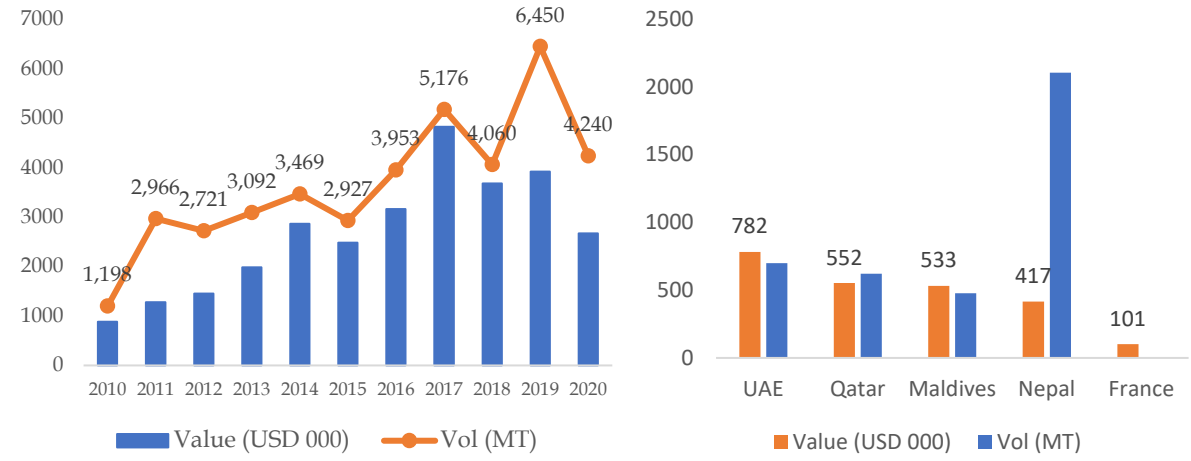
Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India

3.6.2. Pineapple Trade

India is the 6th largest producer of pineapples globally and its import of the commodity is negligible. In 2019, India imported only 18 MT (worth USD 5,000) of pineapples from Malaysia. In 2020 the imports have been ~0. During the previous years also, India's pineapple imports have remained negligible (~0 in 2017, 2018).

On the export front, India exported 4,240 MT of pineapples worth USD 2.6 million in 2020. The major markets included UAE, Qatar, Maldives, Nepal and France (value terms). Pineapple exports from India have been increasing at a CAGR of ~12% and 13% in value and volume terms respectively during the period 2010-2020.

Exhibit 68: India's Pineapple Exports Trend and Major Importing Partners



Source: ITC Trade Map

3.6.3. Trade Partners

India is not an importer of pineapples. The country imported only 18 MT of pineapples worth USD 5000 from Malaysia in 2019. In 2020 the imports were~0.

3.6.4. Profile of Competition and Value Chain Analysis (Primary Survey)

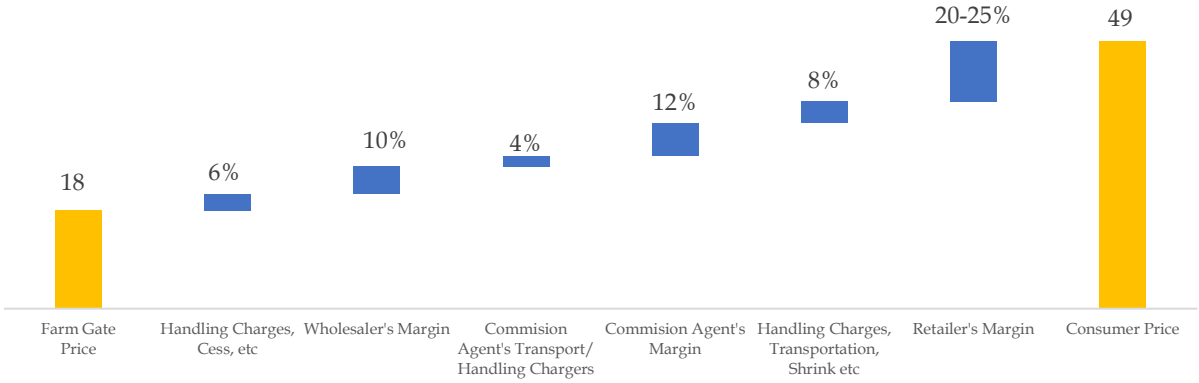
Eastern and Southern India are the key producers of pineapples in India. India's consumption pattern for pineapples is significantly different from majority of other countries. Though pineapple is very amenable to preservation in different forms; bulk of the pineapple produced in the India is consumed in fresh form, and the produce used for processing is less than 10%. This contrasts with the principal producing countries, where over 95% of the pineapple is absorbed by the processing industry.[10] The processing units in India are largely concentrated in Southern (Kerala, Karnataka) and Eastern & North Eastern India (West Bengal, Assam, Meghalaya). These units are dedicated to canning, juicing and pulping.

Pineapple sale generally takes place through the local aggregators, who collect produce from various villages and sell it off to larger distant traders. A small proportion of the produce is sold directly to retailers/ consumers or processors by the farmers. At the local level processing takes place in the form of juices, squashes etc., which are then sold in the local markets. The larger traders sell off the pineapple to larger wholesalers in "mandis" which are then sold to retailers and further down to the consumers. A small proportion of the produce also goes for processing, which is either picked up from the mandis or from large traders, however this

[10] http://prsvkm.kau.in/book/pineapple-industry

offtake is negligible as compared to the fresh fruit offtake. On the storage front, Pineapples with crown can be kept without damage for 10-15 days after harvesting. When fruits are transported to long distances or for a period of several days, refrigerated transport is required to slow down ripening process. Pineapples when stored at 10-13^0 C can be stored for a period of 20 days. The best storage is at 7.2^0 C and 80 or 90% relative humidity[11].

Exhibit 69: Price Mark Up for Pineapple (per kg)



Source: Primary Survey, YES Bank Analysis

Import of pineapple is negligible

3.6.5. Pineapple-Phytosanitary Requirements and Potential for Import from Brazil

India presently does not allow imports of pineapples from Brazil as per the Plant Quarantine (Regulation of Import into India) Order, 2003.

Potential for Import in India-Pineapple

Owing to high production, the Indian consumption is catered internally. Indian imports have also indicated low viability of imported pineapple. However, processed (canned etc.) pineapples can be a sustainable export opportunity

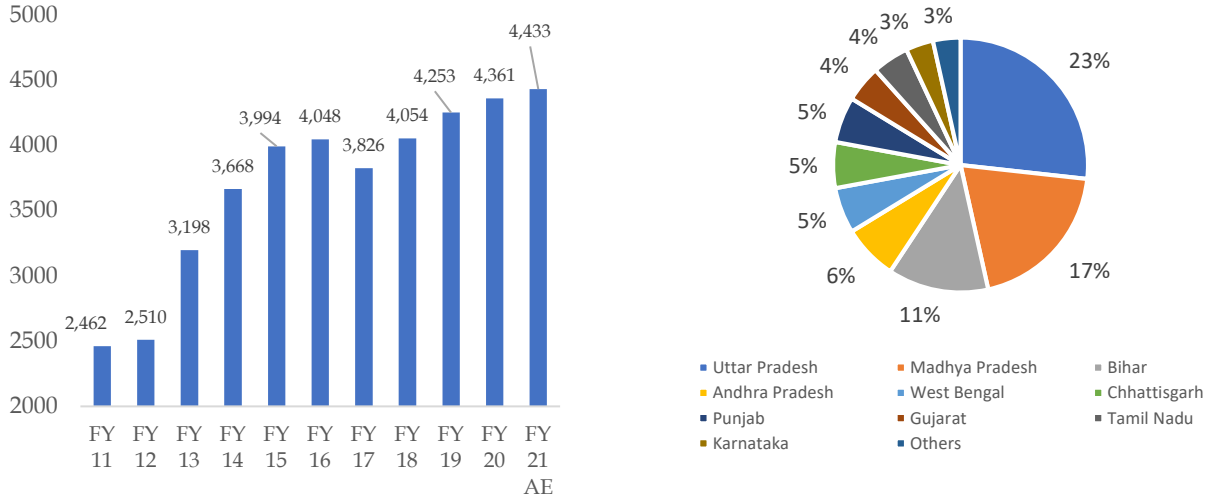
[11] https://www.phytojournal.com/archives/2017/vol6issue6S/PartP/SP-6-6-149.pdf

3.7. Guava (080450)

3.7.1. Guava Production

India's guava production in the year 2020-21 was estimated at 4.43 million MT, which has been growing at a CAGR of 6.06% over the last decade (FY11 - FY21). India's share in global guava production is around 39.3% (FAO 2019). India's average guava productivity in 2020-21 was 14.6 MT/ha. The major guava growing states in India are Uttar Pradesh, Madhya Pradesh, Bihar, Andhra Pradesh and West Bengal.

Exhibit 70: India's Guava Production Trend over last 10 years (000 MT); Major States for Production (000 MT)



Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India

Guavas are harvested throughout the year (except during May and June) in one or the other region of the country. However, peak harvesting periods in north India are August for rainy season crop, November- December for winter season crop and March-April for spring season crop. In mild climatic conditions of other parts in the country, the peak harvesting periods are not so distinct. In Andhra Pradesh guavas are harvested throughout the year.

Exhibit 71: Harvesting Seasons

States	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Uttar Pradesh												
Madhya Pradesh												
Bihar												
Andhra Pradesh												

Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India

The major guava varieties grown in India are as follows:

Exhibit 72: Major Guava varieties grown in India

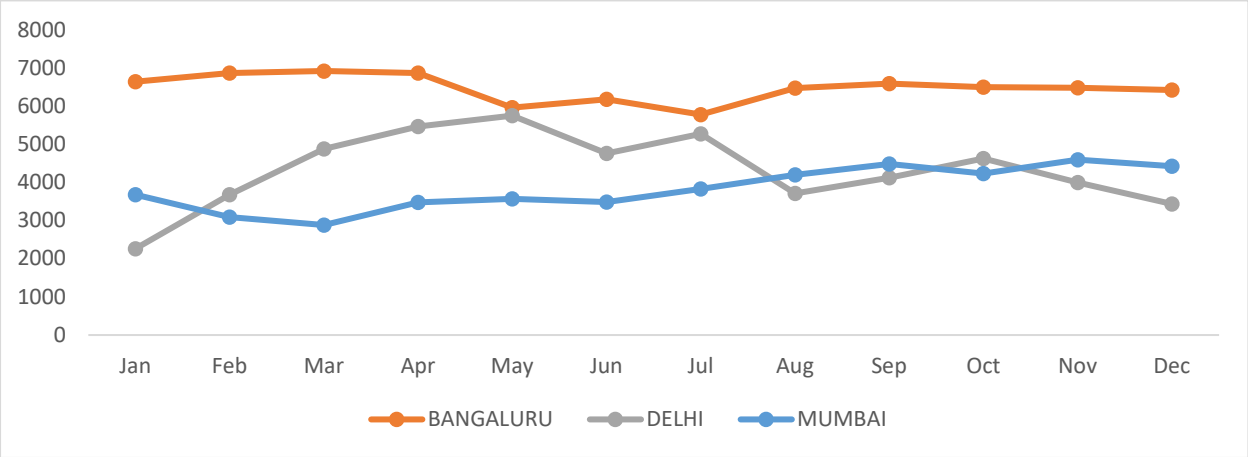
State	Varieties grown
Andhra Pradesh	Allahabad safeda, Lucknow 49, Anakapalli, Banarasi, Chittidar, Hafshi, Sardar, Smooth Green, Safed Jam, Arka Mridula
Madhya Pradesh	L-49, Allahabad safeda, Gwalior-27, Hafshi, Seedless Chittidar
Jharkhad	L-49, Allahabad safeda
Karnataka	Allahabad Safeda, L-49, Araka Mridula, Araka Amulya, Bangalore, Dharwar
Assam	Am Sophri, Madhuri Am, Safrior Payere
Bihar & Jharkhand	Allahabad Safeda, Apple Colour, Chittidar, Hafshi, Harijha, Sardar, Selection-8
Maharashtra & Gujarat	Nagpur seedless, Dharwar, Dholka, Kothrud, L-24, L-49, Nasik, Sindh

North-eastern States	Allahabad Safeda, Sardar, Red Fleshed.
Tamil Nadu	Anakapalli, Banarasi, Bangalore, Chittidar, Hafshi, Nagpur Seedless, Smooth Green
Uttar Pradesh	L-49, Allahabad Safeda, Lucknow Safeda, Apple Colour, Chittidar, Red Fleshed, Allahabad Surkha, Sardar, Mirzapuri Seedless, CISH-G-1, CISH-G-2, CISH-G-3
West Bengal	L-49, Allahabad Safeway, Dubhe Khaja, Gole Khaja, Kabli, Baruipur, Chittidar, Harijha, Sardar

Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India

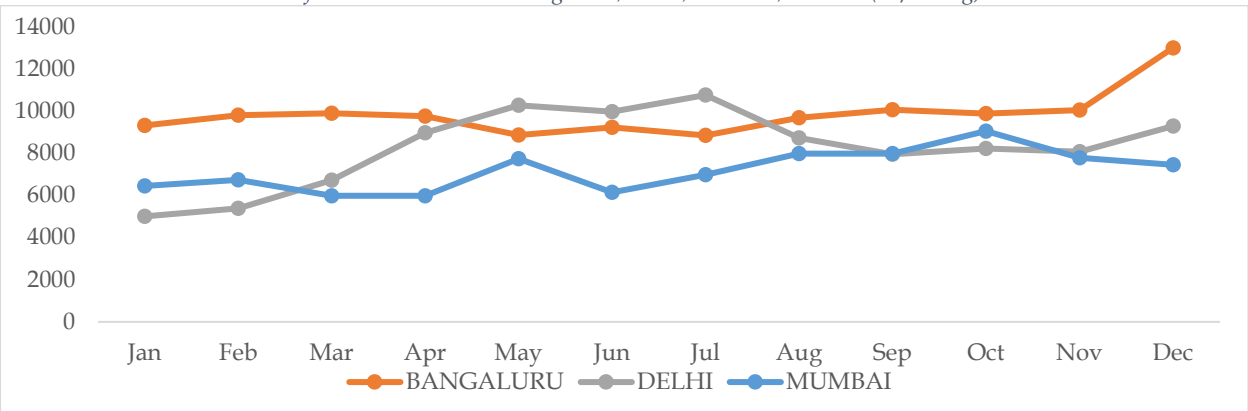
Availability of guava in key markets is largely throughout the year with peak arrivals during Jan to March and July to December. In Delhi the availability is throughout the year, with the price peaking in May. The wholesale and retail prices for other key markets peak in March and Sept. Peak wholesale price reached about INR 69.20/Kg in Bengaluru, while the highest retail price was close to INR 130.38/Kg, in Bengaluru market. Lowest prices were recorded in the month of January.

Exhibit 73: Wholesale Price Trends for Guava in 2019 in Bengaluru, Delhi, Mumbai, Kolkata (INR/100 kg)



Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India

Exhibit 74: Retail Price Trends for Guava in 2019 in Bengaluru, Delhi, Mumbai, Kolkata (Rs/100 kg)



Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India

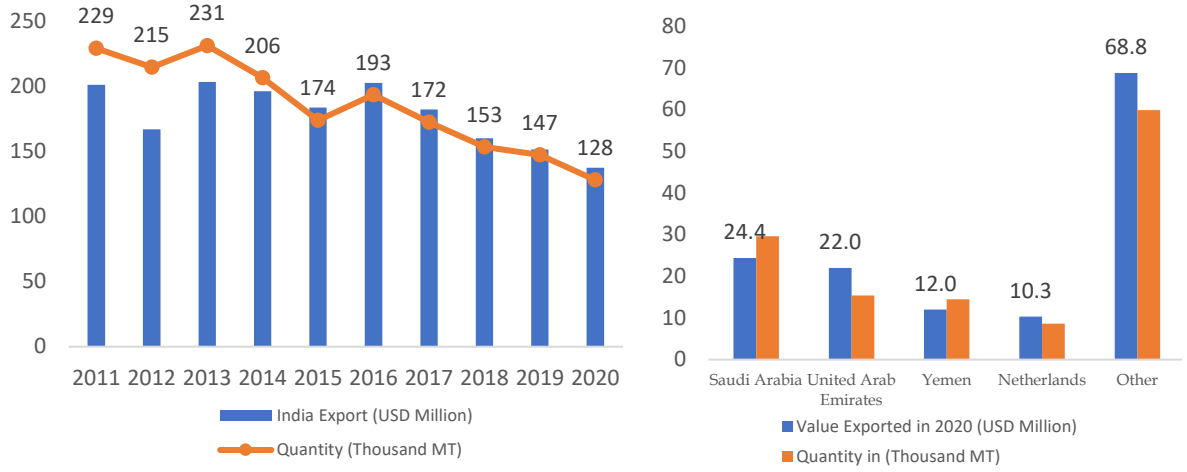
3.7.2. Guava Trade

India is the largest producer of guava globally and its import of the commodity is negligible. In 2020, India produced 25.63 million MT of guava and imported only 656 MT (worth 6.9 Lakh

USD) of guava majorly from Thailand and China. During the previous years also, India's guava imports have remained negligible (1,718 MT in 2019).

On the export front India exported only 0.5% of its total guava production; 128,026 MT of guava worth USD 137 million was exported in FY 2020. The major markets included Saudi Arabia, UAE, Yemen, Netherlands, UK, and Kuwait in terms of value.

Exhibit 75: India Guava Export Trends; Major Exporting Countries (HS Code 080450)



Source: ITC Trade Map

3.7.3. Trade Partners

India is not an importer of guava. The country imported only 656 MT of guava worth USD 697,000 USD in 2020.

3.7.4. Market Analysis

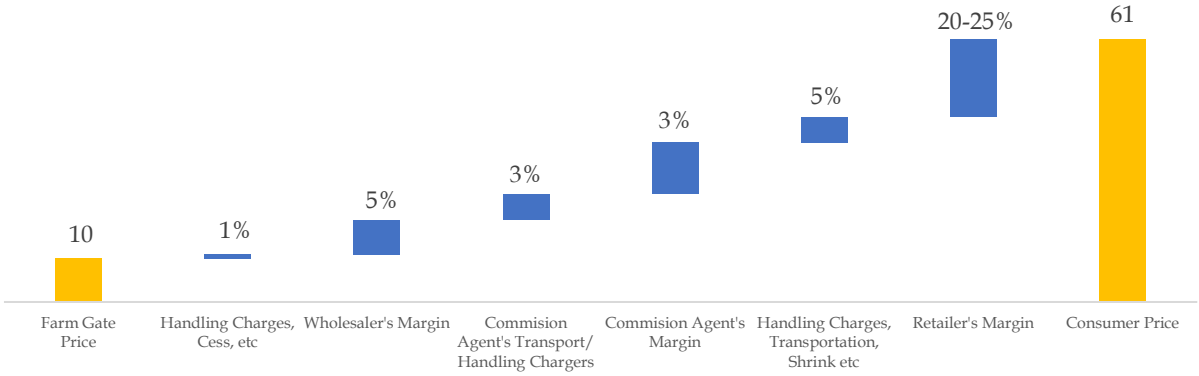
Guavas are consumed either as fresh fruit or in processed form. Guava fruits have very short shelf life because it undergoes rapid postharvest ripening in a few days under ambient conditions and becomes overripe within a week making it difficult for distant marketing. India being the largest producer of guava globally exports only 0.5% of its total guava production. The losses in guava are among the highest at around 16%. For long distance transportation, use of refrigerated transport and proper packaging and cushioning material is required to enhance the shelf life of fruits. The shelf life can be extended up to 15 days by keeping them at low temperature of 8 - 10 Celsius and 75-85% relative humidity. It can be stored for about 10 days at room temperature (18-23 degree Celsius) in polybags providing a ventilation of 0.25%. Controlled/modified atmosphere storage methods can extend the shelf life, but, an inappropriate storage atmosphere may result in accumulation of fermentative metabolites resulting in development of severe off-flavors. The use of anti-transparent, wax coatings, growth retardants, irradiation and different types of storage facilities have been tried to increase the shelf life of harvested fruits with limited success. Recent technologies such as the phospholipase D inhibition technology using hexanal compositions have been observed to enhance shelf life for a month through its multifold

actions involving the modulation of ethylene signal transduction pathway and gene expression.

The processing industry for guava needs to be developed to lower the marketing costs and reduce wastage and losses in the production chain.

Guavas can be dehydrated and powdered. Two types of wine, viz. guava juice wine and guava pulp wine can be manufactured from ripe fruits. Good quality ready-to-serve beverage can be made from guava. The seeds contain 5-13% oil which is rich in essential fatty acid and can be used in salad dressing.

Exhibit 76: Price Mark Up for Domestic Guava (per kg)



Source: Primary Survey, Yes Bank Analysis

3.7.5. Guava-Phytosanitary Requirements and Potential for Import from Brazil

India presently does not allow imports of guavas from Brazil as per the Plant Quarantine (Regulation of Import into India) Order, 2003.

Potential for Import in India-Guava

Import of guava is not recommended due to high perishability of the crop and high Indian production.

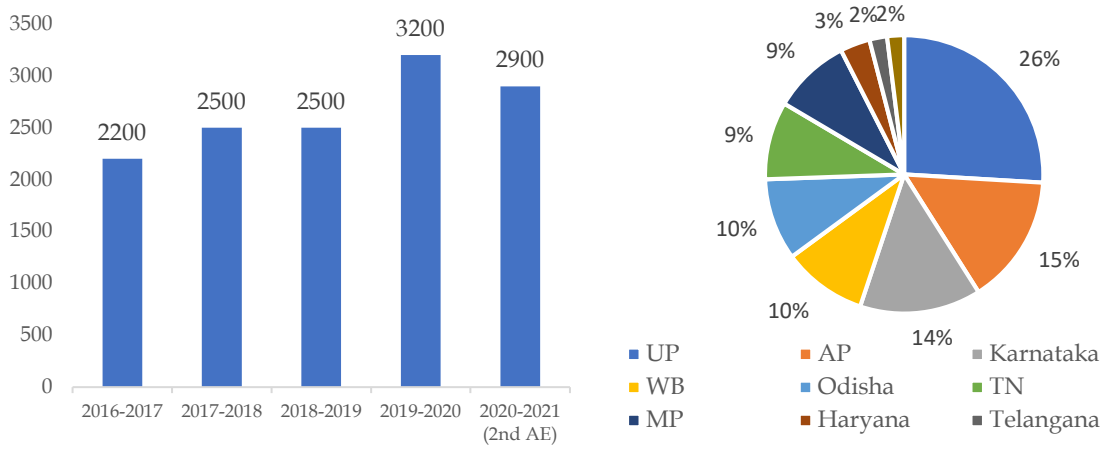
3.8. Watermelons (080711)

3.8.1. Watermelon Production

India's watermelon production in the FY 2020-21 was estimated at 2.9 million MT, which has been growing at a CAGR of 5.1% over the last 5 years (FY2016-FY2021). India is the third largest producer of watermelon globally with a share of ~2.5% (FAO 2019). India's average watermelon productivity in FY 2020-21 was 28.7 MT/ha, which is lower as compared to global average productivity of 32.5 MT/ha.

The major watermelon growing states in India are UP, AP, Karnataka, WB and Odisha.

Exhibit 77: India's Watermelon Production Trend over last 5 years (000 MT); Major Production States



Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India

The major watermelon varieties grown in India are Arka Manik, Durgapur Kesar, Arka Jyoti, Asahi Yamoto, Suagr Baby, Madhuri 64 etc.

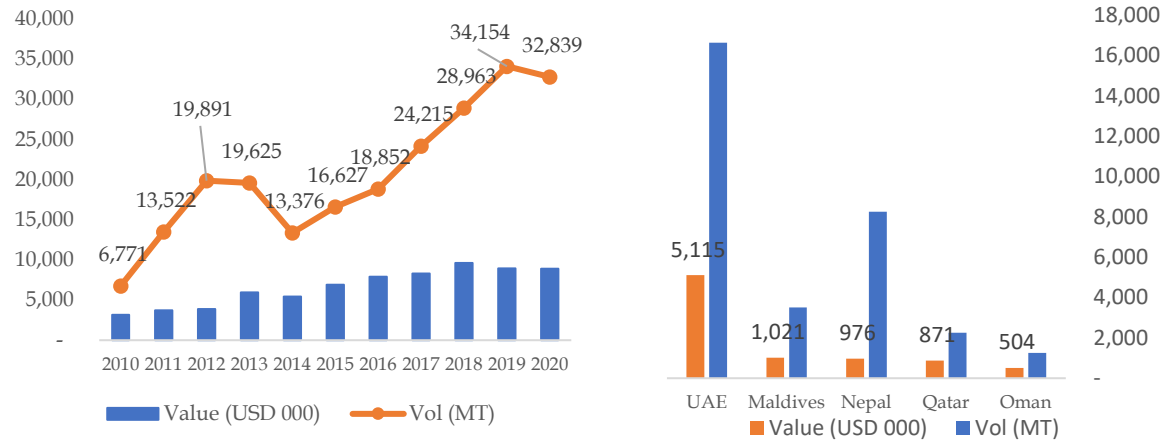
The fruit crop is grown from January to February in plain regions of the country. Depending upon the variety and climatic conditions, the watermelons are harvested in ~85 to 115 days after sowing of the crop.

3.8.2. Watermelon Trade

India is the 3rd largest producer of watermelons globally and its import of the commodity is negligible. In 2019, India imported only 319 MT (worth USD 288,000) of watermelons primarily from UAE, Maldives amongst others.

On the export front, India exported 32,839 MT of watermelons worth USD 8.9 million in 2020. The major markets included UAE, Maldives, Nepal and Qatar (value terms).

Exhibit 78: Indian watermelons Exports Trends and Major Partners



Source: ITC Trade Map

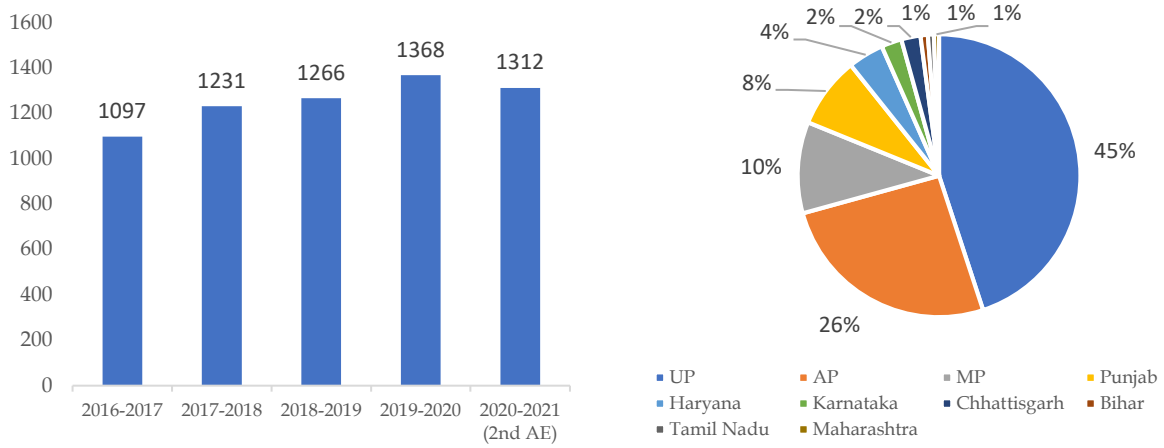
3.10. Melons 080719)

3.10.1. Melon Production

The global production of melon was ~27.5 million MT, produced at ~1.03 million Ha of area. India's melon production in FY21 was estimated at 1.3 million MT, which has been growing at a CAGR of 7% over the last 5 years (FY16-FY21). India is the third largest producer of melons globally with a share of ~5% (FAO 2019). India's average melon productivity was 22.2 MT/ha, which is lower as compared to global average productivity of 26.4 MT/ha (Global Best-*Cyprus 57 MT/ha; Honduras 52.8 MT/ha; Bahrain 48.6 MT/ha*)[12].

The major melons growing states in India are UP, AP, MP, Punjab and Haryana.

Exhibit 79: India's Melon Production Trend over last 5 years (000 MT); Major Production States



Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India

The major melon varieties grown in India are Hara Madhu, Annamalai, Lanow Safed, Haribhari, Pusa Assarbati, Punjab Sunhari, Arka Rajhans, Durgapura Madhu, Arka Jest etc.

The fruit crop is grown from November to February in plain regions and April to May in hilly regions of the country. Depending upon the variety and climatic conditions, the melons are harvested in ~85 to 115 days after sowing of the crop.

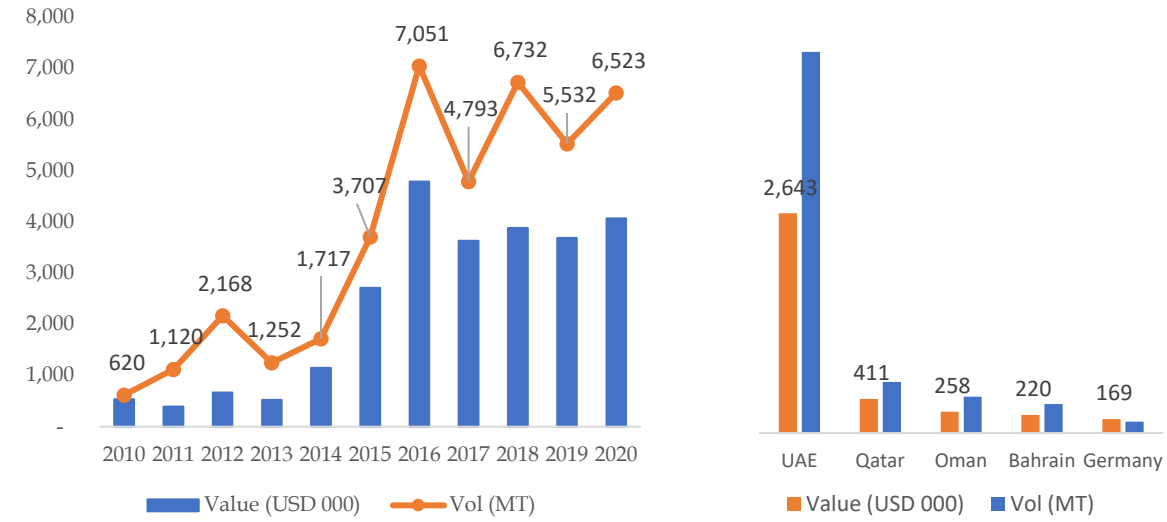
3.10.2. Melons Trade

India is the 3rd largest producer of melons globally and its import of the commodity is negligible. In 2020, India imported only 160 MT (worth USD 118,000) of melons from Afghanistan and Thailand.

On the export front India exported 6,500 MT of melons worth USD 4.07 million in the year 2020. The major markets included UAE, Qatar, Oman, Bahrain and Germany (value terms).

[12] FAOSTAT- latest available data is for 2019

Exhibit 80: Indian Melons Exports Trends and Trade Partners



Source: ITC Trade Map

3.10.3. Watermelons and Melons-Phytosanitary Requirements and Potential for Import from Brazil

India presently does not allow imports of melons from Brazil as per the Plant Quarantine (Regulation of Import into India) Order, 2003.

Potential for Import in India-Watermelons and Melons

As these are commodities with bulk weight, watermelons are not recommended.

Musk melon can be explored.

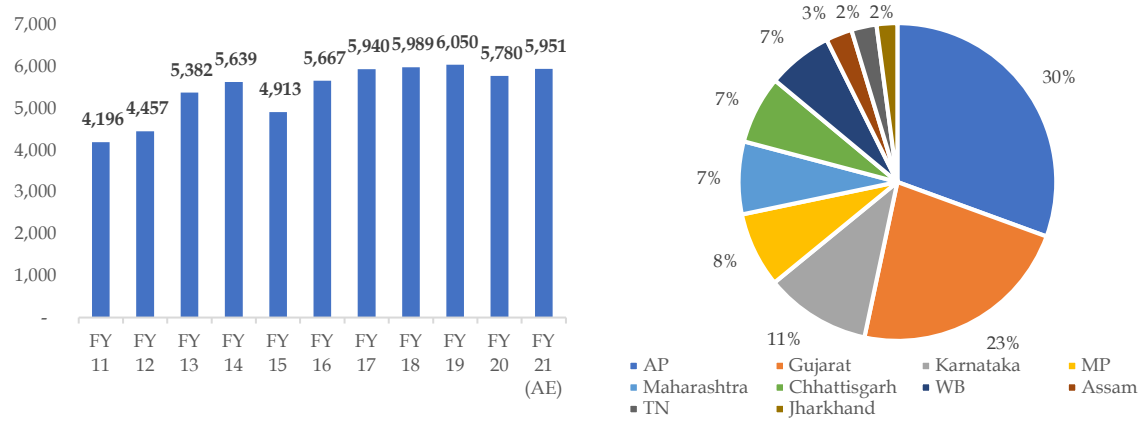
3.12. Papaya (080720)

3.12.1. Papaya Production

The production of Papaya globally was estimated at 13.73 million MT in the year 2019 which is expected to reach to 16.6 million MT by year 2029 (estimated to grow ~2.9% per annum). India's papaya production in FY21(2nd AE) was estimated at 5.9 million MT, which has been growing at a CAGR of 3.6% over the last decade (FY11- FY21).

India's average papaya productivity in FY 2020-21 was 41.3 MT/ha, which is higher as compared to global average productivity of 29.6 MT/ha (*Global Best-Dominican Republic 303.4 MT/ha; El Salvador 139.4, Indonesia 93.1 MT/ha, Cost Rica 90.7 MT/ha*).
The major papaya growing states in India are AP, Gujarat, Karnataka, MP and Maharashtra.

Exhibit 81: India's Papaya Production Trend over last 10 years (million MT); Major Production States



Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India

Exhibit 82: Major Harvesting Season

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Andhra												
Gujarat												
Karnataka												
MP												
Maharashtra												

Round the year | Peak Season | Lean Season

Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India

In some of the states such as Andhra, Assam, Maharashtra, TN and WB, Papaya is available throughout the year. The month of Feb to March and April are the peak months of papaya supply in the market.

Exhibit 83: Common varieties of Papaya in various states

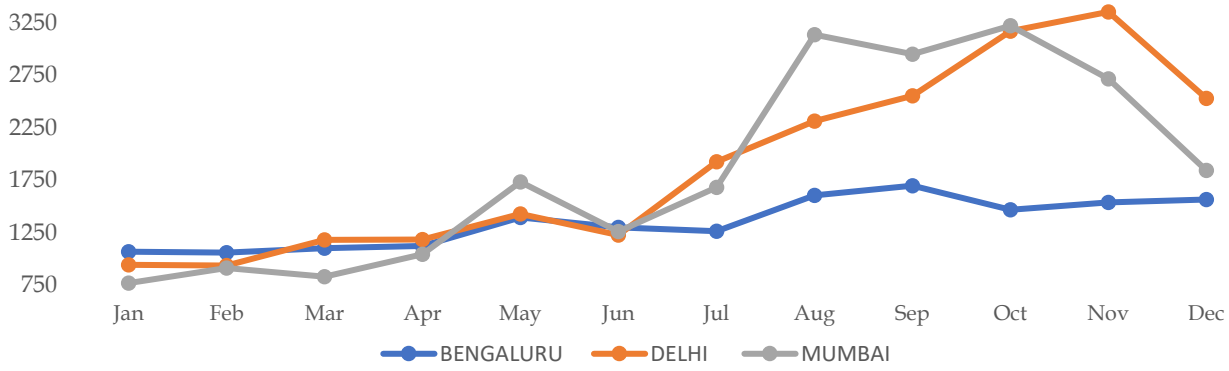
States	Varieties of Papaya grown
Andhra Pradesh	Taiwanese lines, Arka Surya and Arka Prabhath
Bihar	Pusa Dwarf, Pusa Majesty, Pusa Nanha, Pusa Giant, Pusa Delicious and Ranchi
Karnataka	Coorg Honey Dew, Sunrise Solo, CO.3, CO.4, Arka Surya, Arka Prabhath &Taiwanese lines.
Maharashtra	Ranchi selection, Honey Dew, Washington, Coorg Green
Orissa	Coorg Honey Dew, Surya, Washington, Ranchi, Pusa Dwarf and Pusa Delicious.

Tamil Nadu	CO.2, CO.5, CO.6, CO.7, CO.8, Arka Surya, Arka Prabhath, Coorg Honey Dew & Taiwanese
Uttar Pradesh	Coorg Honey Dew, Pusa Dwarf, Pusa Delicious, CO.1, CO.5 and Barwani Red.

Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India

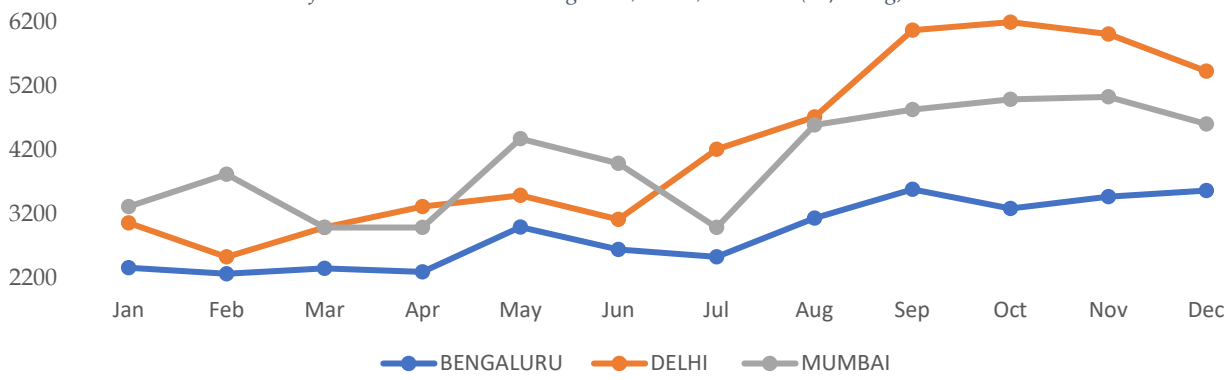
Availability of papaya in key markets is largely throughout the year with peak arrivals during July to Nov. The wholesale and retail prices start peaking from July onwards, with Mumbai witnessing the highest prices, almost throughout the year. The prices are quite volatile towards the end of the year. Peak wholesale price reached about INR 33.5/Kg (in Mumbai market), while the highest retail price was close to INR 61/Kg (in Delhi market).

Exhibit 84: Wholesale Price Trends for Papaya in 2019 in Bengaluru, Delhi, Mumbai (Rs/100kg)



Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India

Exhibit 85: Retail Price Trends for Banana in 2019 in Bengaluru, Delhi, Mumbai (Rs/100kg)



Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India

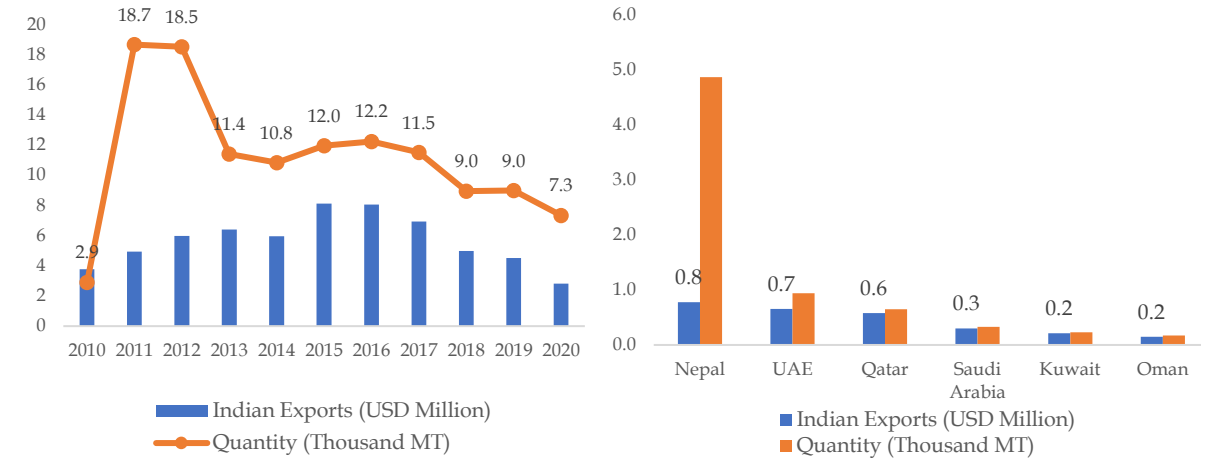
3.12.2. Papaya Trade

India is largest producer of papaya but exported only 8,982 MT in 2019, which converts to roughly 1.5% of total papaya exports of world in value terms. Middle eastern countries are major markets for Indian papaya. From the year 2010 to 2020 CAGR growth in value terms was -0.3% and was -19% between year 2015-2019.

On the export front India exported 7,346 MT of papaya worth USD 2.8 million in 2020. The major markets included Nepal, UAE, Qatar, Saudi, Kuwait, (value terms).

India does not import Papaya.

Exhibit 86: Indian Papaya Exports Trends and Major Partners



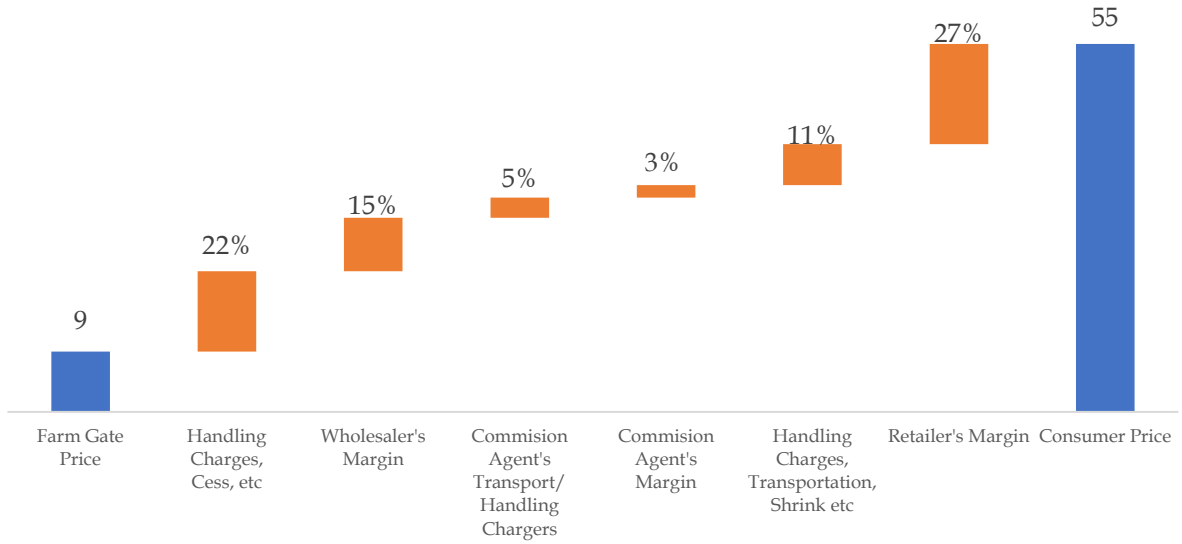
Source: ITC Trade Map

3.12.3. Profile of Competition and Value Chain Analysis (Primary Survey)

Around 80% of the country's papaya production is concentrated in 5 states namely- Andhra Pradesh, Gujarat, Karnataka, MP and Maharashtra. In India, due to lack of post-harvest infrastructure, losses have been estimated in the range of 5-30% of total domestic production. The market discarded fruits due to mechanical injury during various stages of value chain viz during harvesting, transportation, washing, grading, packing etc. are not used for processing. Papaya can be processed into pulp/ puree, jam, squash, sauce, papaya toffee, pickles and have good consumer demand because of nutritional and medicinal value. Papaya pulp/ puree are aseptically packed with a shelf life of ~15 months when stored below 15 degree Celsius. These are sold in 20 kgs aseptic bags packed in boxes as well as in 215/225/228 kgs bag in drum packaging (can be sold in customized packets as per the customer's requirement). The major companies involve in papaya processing are Jain irrigation, Capricorn Food Products India Limited, Chitale Agro, ABC Fruits, Shimla Hills amongst others.

The major stakeholders involved in the chain are Farmers or Large producers, Agent/ FPOs/ Wholesalers, Corporate/ input service providers, Government and research agencies and consumers. In the convention supply chain model, farmers sell the produce either to pre-harvest contractors or commission agents who in turn sell to wholesalers. Papayas reach end consumers via retailers or distributors. Pre harvest contractors also manages post-harvest activities. Sometimes wholesalers also act as pre harvest contractors. Majority of trade is through local retail network. The distribution network is characterized by inefficient transport, high demand-supply gap at retail level. Fruits are highly perishable in nature. They can be stored for a period of 1-3 weeks at a temperature of 10-13 degree Celsius and 85-90% relative humidity.

Exhibit 87: Price Mark Up for Domestic Papaya (per kg)



Source: Primary Survey, YES Bank Analysis

3.12.4. Papayas-Phytosanitary Requirements and Potential for Import from Brazil

India presently does not allow imports of papayas from Brazil as per the Plant Quarantine (Regulation of Import into India) Order, 2003.

Potential for Import in India-Papayas

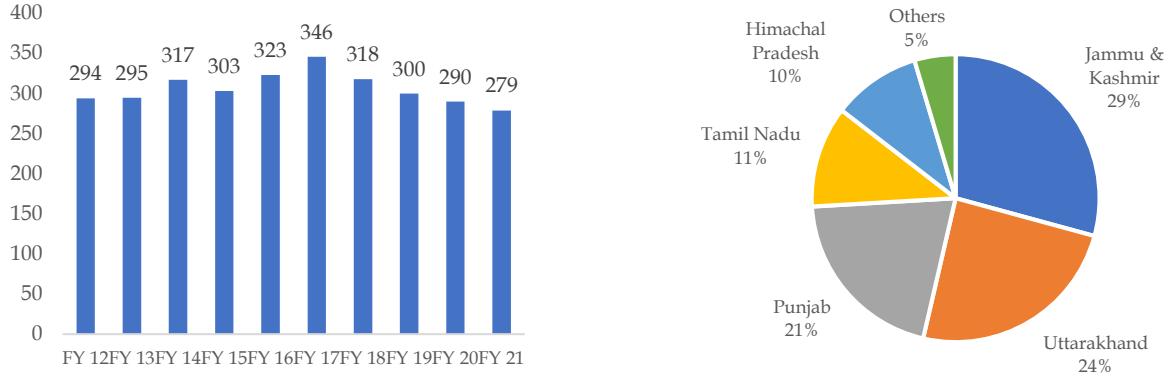
There is low opportunity for fresh papaya in India.

3.14. Pear (080830)

3.14.1. Pear Production

India's pear production during FY was 279,000 MT and has been growing at a CAGR of -0.65% over the last decade (FY11-FY21). India is the 10th largest producer of pear in the world having share of 1.3% in global pear production. India's average pear productivity is only 7.1 MT/ha as compared to global average productivity of 14.5 MT/ha. India share in pear imports was 0.7% in the year 2020 and its ranking in world imports was 30. The major pear growing states in India are J&K, Uttarakhand, Punjab, Tamil Nadu and Himachal Pradesh.

Exhibit 88: Production Trend of Pear over last 10 years ('000 MT), Major Pear Producing States



Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India

Exhibit 89: Harvesting Seasons of Pear

Jan		Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
					L	*P*	*P*	*P*	*L*	*L*		

Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India (Peak-P, Lean-L)

The major pear varieties grown in India are:

Exhibit 90: Pear Varieties in India

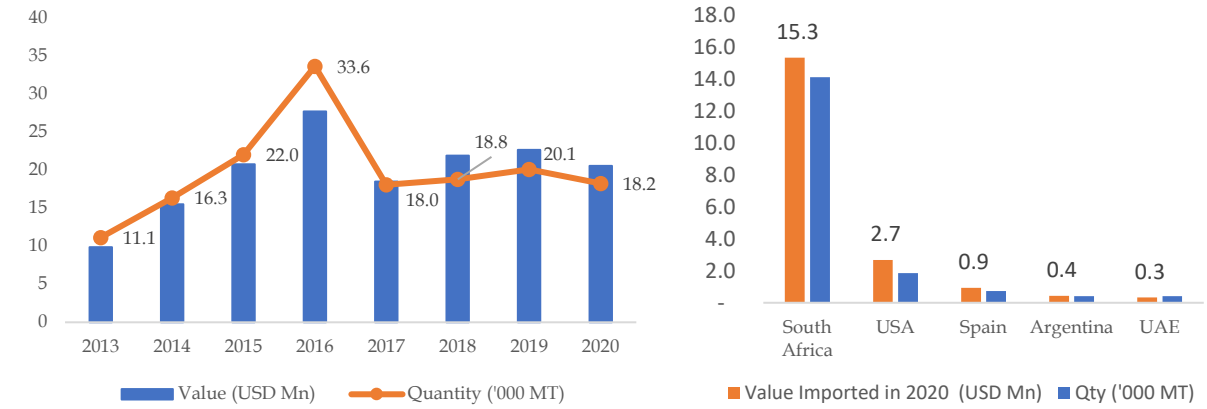
J&K	China pear, Beurre-de-Amanlis, William Bartlett, China Sand Pear, Favourite, Doyenne Bussoch, Genta Drauard Fertility & Citron –do-Carme, Clapp's, Viear of Winkfield and Hardy
Himachal Pradesh	China pear, Keiffer and Patharnakh
Uttar Pradesh	Hardy, Clapp's Favourite, Winter Nelis, Confrence, William Barlett, Comice and Flemish Beauty

Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India

3.14.2. Pear Trade

India imported around 18,224 MT of Pears (Fresh) in the year 2020, with the major import partners being South Africa (74.9%), USA (13.1%), Spain (4.5%) and Argentina (2.1%). During last decade (FY10- FY20) India's Pear imports have grown at a CAGR of 7.3% in volume terms and 11% in value terms. Currently, India is not importing pears from Brazil.

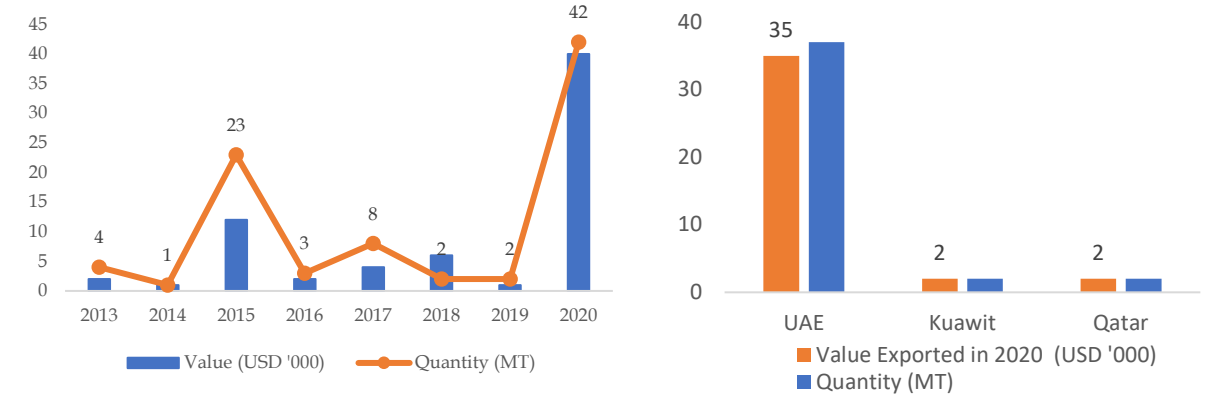
Exhibit 91: India Import Trends and Major Partners for Pear



Source: ITC Trade Map

India's share is negligible of world's pear exports and it ranks 65 in world's export. India exported only 42 MT of pear, worth USD 40,000 in 2020. The export markets for India are UAE, Qatar and Kuwait. India's pear exports have grown at a CAGR of 53.4% in terms of value and 39.9% in terms of volume during 2013-2020.

Exhibit 92: Indian Pear Exports Trends and Major Partners

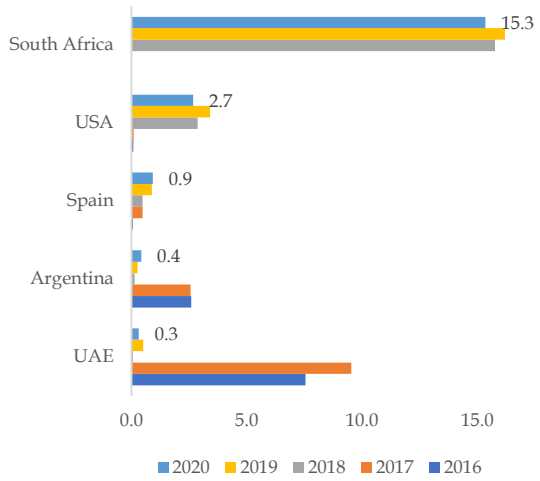


Source: ITC Trade Map

3.14.3. Trade Partners

The major partners exporting pears into India are South Africa (74.9%), USA (13.1%), Spain (4.5%) and Argentina (2.1%).

Exhibit 93: Major Countries Exporting Pear to India (in value terms) Import in USD million



	Value CAGR (Last five year till 2020)	Percent Share to Indian Pear Imports- 2020	Country percent to Global Trade Country/ Rank to Global Exports	Rank to Global Pear Export 2020	Landed Price of Pear in 2020 (USD/ MT)
South Africa	19.4 %	74.9%	7.1%	Rank :5	1,087
USA	0.9%	13.1%	5.1%	Rank :6	1,444
Spain	97.5 %	4.5%	4.1%	Rank :8	1,256
Argentina	50.4 %	2.1%	9.4%	Rank : 4	1,047
UAE	324.3 %	1.6%	0.01%	Rank : 42	773

Exhibit: ITC Trade Map

3.14.4. Profile of Competition and Value Chain Analysis (Primary Survey)

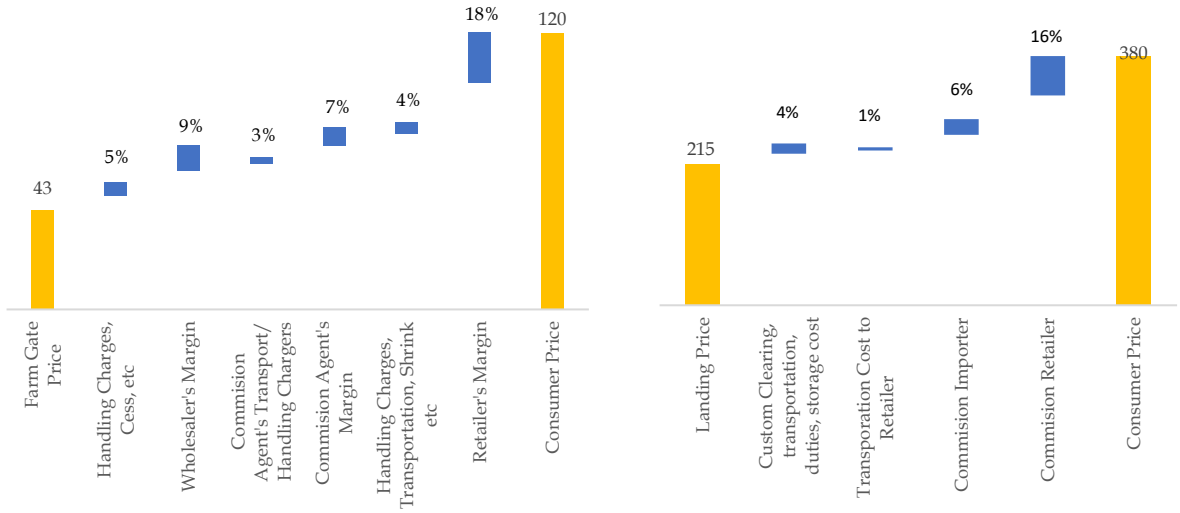
India's key pear producing states are Jammu and Kashmir, Uttarakhand, Punjab and Tamil Nadu and pear are available mainly from late summer to early winter. Key primary varieties which are cultivated in India includes Williams, Bartlett, Nag and Comice. Indian pear production is cyclical in nature, with yields varying by as much as 20% depending on weather conditions at the time of blossom and harvest.

Pear consumption is projected to rise due to a growing urban middle class, increasing popularity of the imported fruit varieties among Indian consumers and demand penetration towards Tier-2 cities. In India, pears are primarily consumed in fresh form and only about 2% of domestic production is processed, due to high unit costs.

India's domestic pear season complements the U.S. pear season. India mainly imports Green and Red Anjou (more popular variety) Pears varietals from the United States (arriving in November and sold through late March). Indian demand for red pears and nascent U.S. varieties like Green Bartlett and Packham is also increasing. Since the Chinese pear import ban in June 2017, South Africa has remained as the top pear exporter to India, followed by the United States and Spain. South African Packham pears are at a competitive advantage compare to other imported varieties as they can be stored longer than other imported varieties, thereby extending their availability.

Pears are transported in normal trucks in India.

Exhibit 94: Price Mark Up in for Pear Domestic and Imported Fruit (per kg)



Source: Primary Survey, YES Bank Analysis

3.14.5. Pears-Phytosanitary Requirements and Potential for Import from Brazil

India presently allows imports of pears from Brazil as per the Plant Quarantine (Regulation of Import into India) Order, 2003. The additional declarations required on the phytosanitary certificate are listed below:

Exhibit 95: Additional Phytosanitary declarations for Importing Pears

Free from:	**Pre-shipment/ in transit cold treatment at zero degree Celsius (00C) for 40 days. The treatment should be endorsed on Phytosanitary Certificate issued at the country of origin/re-export.**
a. Anastrepha fraterculus (South American fruit fly)	
b. Anastrepha serpentine (Sapodilla fruit fly)	
c. Grapholita molesta (Oriental fruit moth)	
d. Pantomorus cervinus (Fuller"s rose beetle)	
e. Peridroma saucia (Pearly underwing moth)	
f. Phytophthora cryptogea (Tomato foot rot)	
g. Pseudococcus calceolariae (Scarlet mealybug)	
h. Pseudococcus Comstocki (Comstock mealybug)	
i. Pseudomonas viridiflava (Bacterial leaf blight of tomato (USA))	
j. Venturia pyrina (Black spot of pear)	

Source: Plant Quarantine (Regulation of Import into India) Order, 2003.

Potential for Import in India-Pears

Brazil has an opportunity to tap fresh pear in India as the demand is growing. Pears from South American countries like Argentina are being imported.

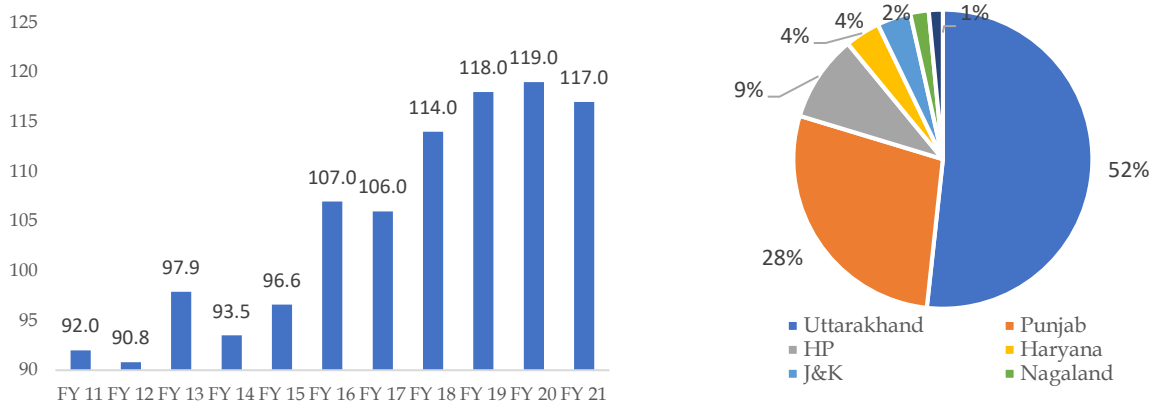
3.15. Peach (080930)

3.15.1. Peach Production

India's peach production in FY21 was ~ 0.12 million MT which has been growing at a CAGR of 2.4% in last decade (FY11-FY21). India's share in the total world peach production is merely 0.5% (FAO 2019). India's average peach productivity is 6.5 MT/ha as compared to global average productivity of 16.8 MT/ha (Global Best-*Egypt 22.7 MT/ha; France 22.4 MT/ha*). India's share in global peach imports is negligible ~.01%, with a ranking of 92.

The major peach growing states in India are Uttarakhand, Punjab, Himachal Pradesh, Haryana, J&K and Nagaland.

Exhibit 96: Production Trend over last 10 years (000 MT); Major Production States



Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India

The peach season in India is very short, with May and June being the peak season. In Punjab, April and May are the peak months for harvesting.

Exhibit 97: Harvesting Seasons

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Uttarakhand				L	P	P						
Punjab*				P	P	*L*						
HP				L	P	P						

*Source: Secondary Source; (Peak-P, Lean-L)** https://www.apnikheti.com/en/pn/agriculture/horticulture/fruit/peach

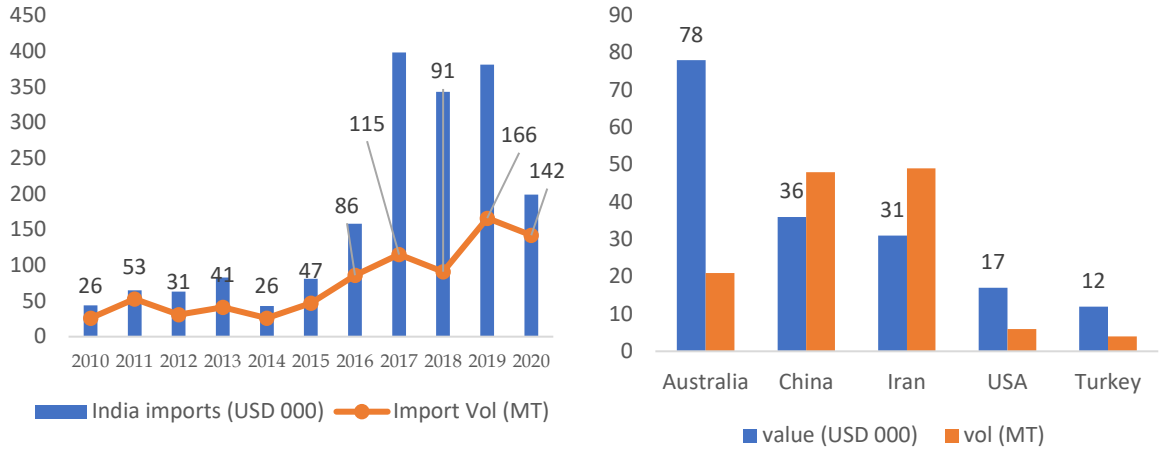
The major peach varieties grown in India are Prabhat, Pratap, Floridasun, Shan -e- Punjab, Florida red sun, Red (Nectarine), Khurmani, Sharbati, Floridaprince.

The arrivals and price trends for peach are not captured by NHB.

3.15.2. Peach Trade

India imported around 142 MT of Peaches worth USD 0.2 million in 2020 (as against 166 MT worth USD 0.38 million), with the major import partners being Australia (39%), China (18%), Iran (16%), USA (9%) and Turkey (6%) (in value terms). Indian peach imports have witnessed a CAGR of 16% and 19% (2010-2020) in value and volume terms respectively. India does not import peaches from Brazil.

Exhibit 98: Indian Peach Import Trends and Major Partners



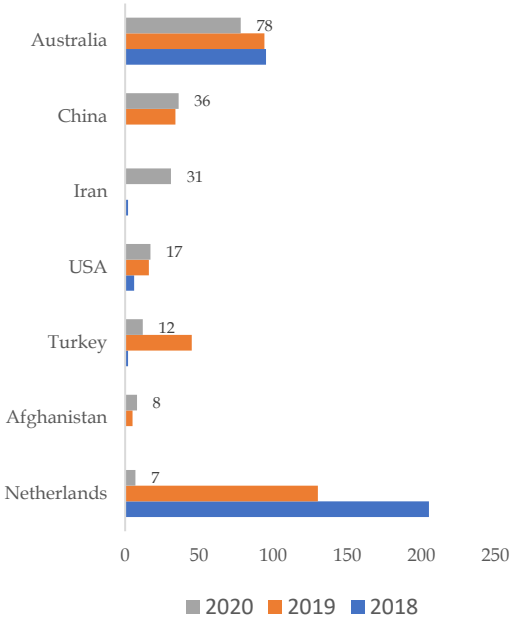
Source: ITC Trade Map

India does not export peaches

3.15.3. Trade Partners

The major partners exporting peaches into India are Australia (39%), China (18%), Iran (16%), USA (9%) and Turkey (6%). Netherlands was also a key partner for the country until 2019, however in 2020, miniscule exports have taken place to India from the country.

Exhibit 99: Major Countries Exporting to India



	CAGR* (Last five year till 2020)	Percent Share to Indian Peach Imports	Country Percent to Global Trade Country/ Rank in Global Exports
Australia	25%	39%	2% Rank:11
China	100%	18%	5.9% Rank:3
Iran	53%	16%	0.1% Rank:32
USA	-3%	09%	5.4% Rank: 6
Turkey	41%	06%	6.7% Rank:2
Afghanistan	82%	04%	~0% Rank:77
Netherlands	8%	04%	0.6% Rank:12

*Source: ITC Trade Map, *where data for 2015 is not available the latest year has been taken for CAGR calculation*

3.15.4. Profile of Competition and Value Chain Analysis (Primary Survey)

Peaches are mainly grown in the northern region of the country, with more than 50% contribution from the state of Uttarakhand. Peaches have limited harvesting period and comparatively lesser shelf life. The storage of peaches is not a common practice as the storage period is small (2-4 weeks) and the fruit is susceptible to chilling injuries.

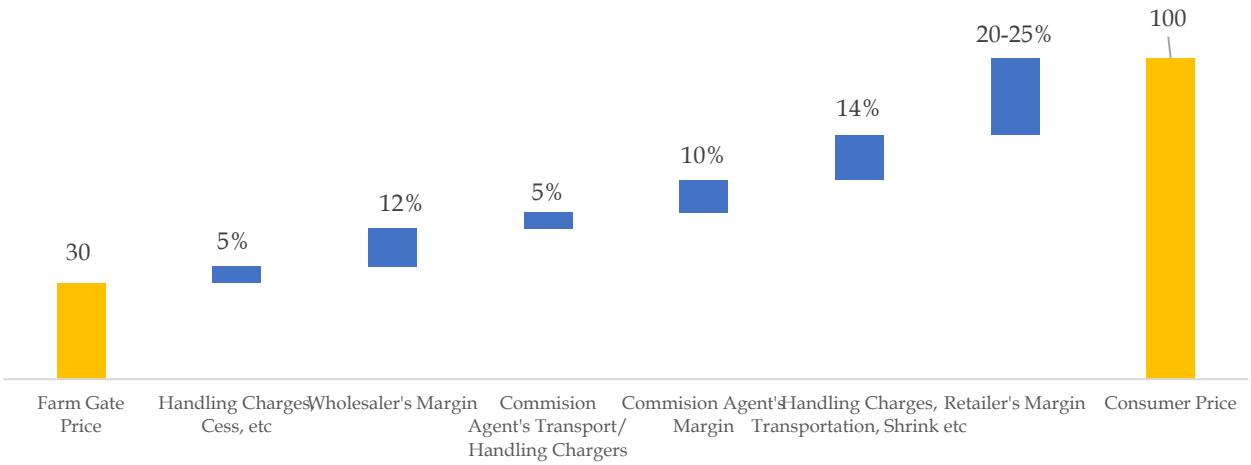
Peach sales at the farm gate are made to village/block level aggregators, who in turn sell to larger middlemen, who carry the produce the local mandi/s near the production zone or much larger mandis (like the Azadpur mandi in Delhi). Due to lack of proper storage facilities at the farm level and low shelf life of the fruit, farmers dispose of the produce soon after harvest or store it in their houses for a very short duration.

The offtake from the mandis is mainly to retailers and then to the final consumers. In some cases, the farmers also sell their produce on roadside to tourists, as the harvesting season coincides with the tourist season in the hilly areas. The price realization is much higher in these case, however only farmers living close to the tourist destinations can leverage this.

Processing of peach is also very limited and is largely undertaken by Self Help Groups (SHGs) operating in the villages. The women of the peach growing villages make jams, jellies, squashes, chutneys etc. from the fruit and sell it locally to nearby markets. With the increasing penetration of online retail channels, some of the SHGs now sell the produce through these channels as well.

3.15.5. Price Mark Up

Exhibit 100: Price Mark Up for Peach (per kg)



Source: Primary Survey, YES Bank Analysis

Import of peach is very limited

3.15.6. Peach-Phytosanitary Requirements and Potential for Import from Brazil

India presently does not allow imports of peaches from Brazil as per the Plant Quarantine (Regulation of Import into India) Order, 2003.

Potential for Import in India-Peach

There is an opportunity to imports from Brazil in India, as the consumption of peaches is growing. However, the perishability is a key challenge

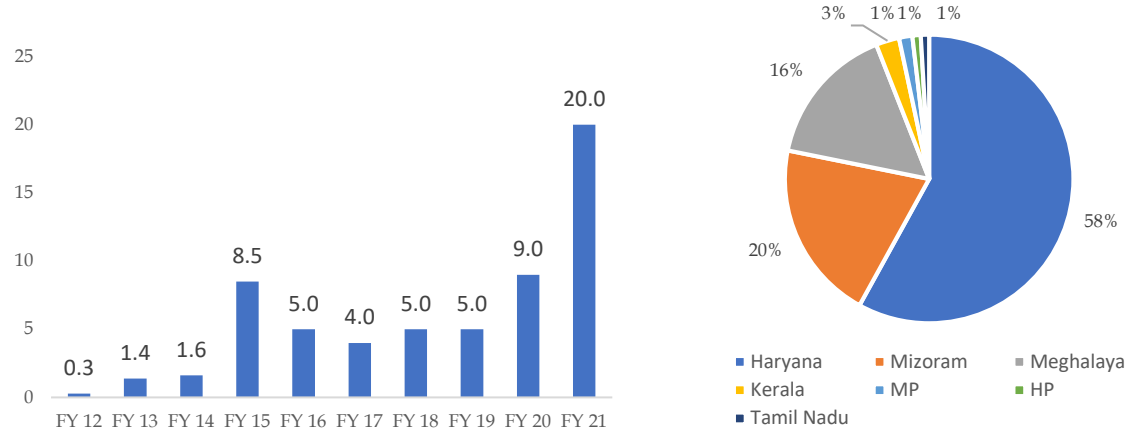
3.16. Strawberry (081010)

3.16.1. Strawberry Production

India's strawberry production in FY21 was ~ 20,000 MT which has been growing at a CAGR of 60% in last 9 years[13] (2011-12 to 2020-21 as per available data). India's share in the total strawberry production is merely 0.1% (the three largest producers include China, USA and Mexico) (FAOSTAT). India's average strawberry productivity is 8MT/ha as compared to global average productivity of 22.4 MT/ha (Global Best-*USA 56.3 MT/ha; Mexico 52.4 MT/ha*). India's share in global strawberry imports is negligible ~0.3% in the year 2020 and its ranking in world imports was 35th.

The major strawberry growing states in India are Haryana, Mizoram, Meghalaya, Kerala and Madhya Pradesh. Maharashtra is also a key producer of strawberries, however the latest data for the state is unavailable.

Exhibit 101: Production Trend over last 09 years (000 MT); Major Production States



Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India

The month of April-May and Oct-Nov are the peak months of strawberry supply in the market.

Exhibit 102: Harvesting Seasons

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
			P	*P*					*P*	*P*	

Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India (Peak-P, Lean-L)

The major strawberry varieties grown in India are Chandler, Tioga, Torrey, Selva, Belrubi, Fern and Pajaro. Other varieties include Premier, Red cost, Local Jeolikot, Dilpasand, Bangalore, Florida 90, Katrain Sweet, Pusa Early Dwarf & Blakemore.

Strawberry arrivals and prices are not captured by NHB.

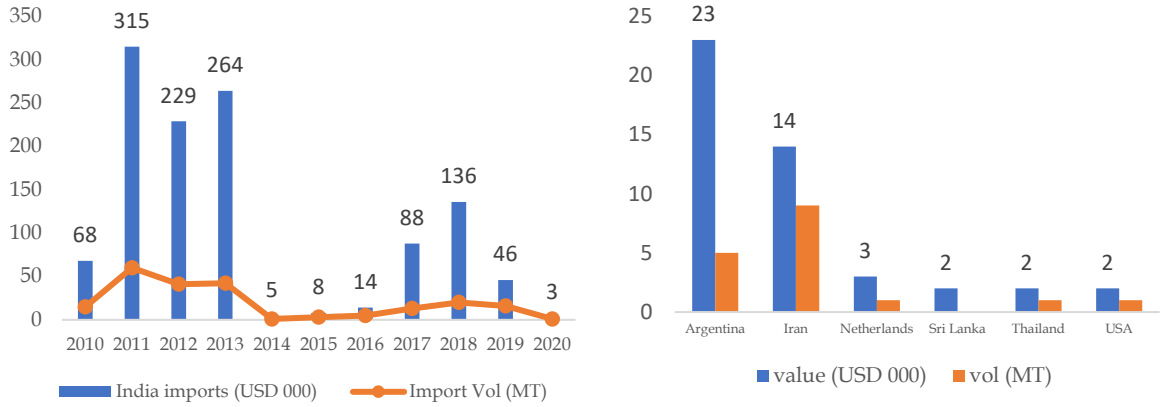
3.16.2. Strawberry Trade

India imported only 1 MT (worth USD 3000) of strawberries in the year 2020, as compared to 16 MT in 2019 (from Iran and Argentina). India's strawberry imports are very miniscule and

[13] Prior to that, it was considered as other fruits, and hence data not available

have been very volatile with the peak being in 2011 of imports worth USD 0.3 million. The imports have been dipping henceforth. Imports have witnessed a decline during the period 2010-20, with values dropping by 46% and volume by 42%. India currently does not import strawberries from Brazil. In 2019*, the key trade partners for India's imports were Argentina (50%) and Iran (30%) (value terms).

Exhibit 103: Indian Strawberry Imports Trends and Major Partners (2019)*

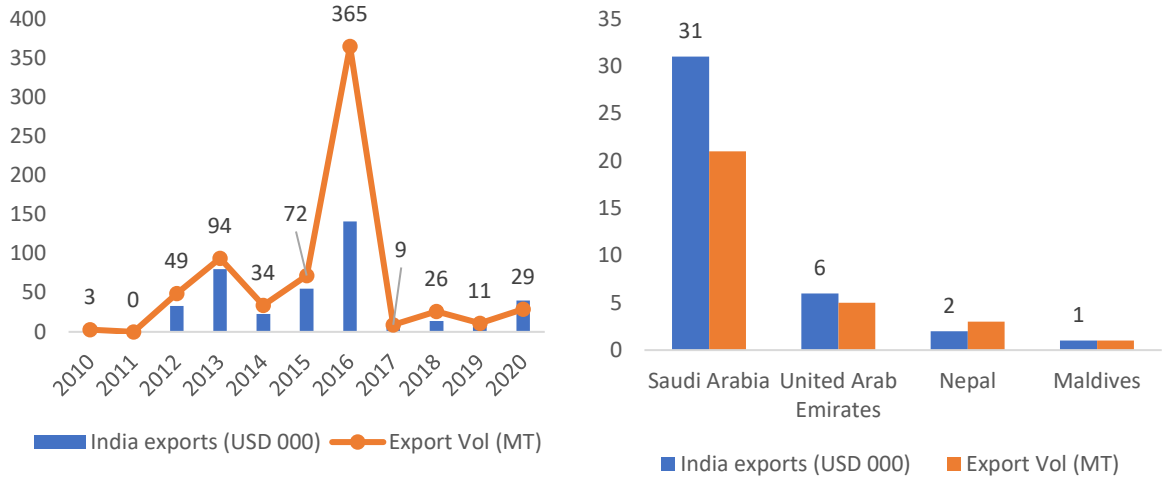


Source: ITC Trade Map

*In 2020 the imports have been miniscule and from 1 country (Turkey), hence data for 2019 has been considered

India is not a major exporter of strawberries. In 2020, the country exported only 29 MT of strawberries worth USD 40,000. The major markets included Saudi Arabia, UAE, Nepal and Maldives. There exports from India have been growing at a CAGR of 19% and 25% in value and volume terms respectively between 2010 and 2020.

Exhibit 104: Indian Strawberry Exports Trends and Major Partners (2020)

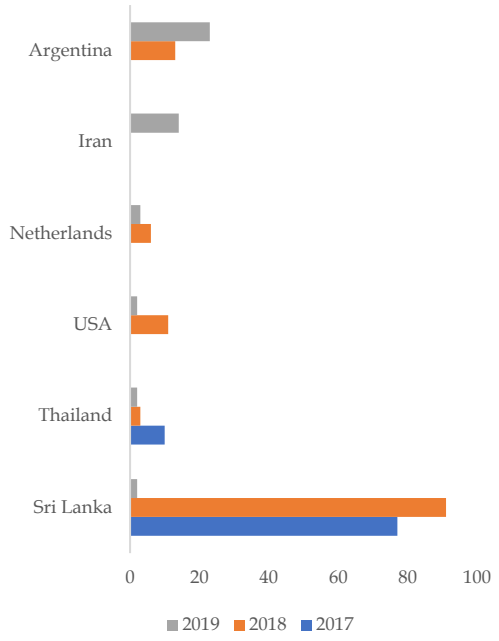


Source: ITC Trade Map

3.16.3. Trade Partners

India's strawberry imports as well as trade partners have been varying significantly over the years. For the year 2019, the major partners exporting to India were Argentina (50%), Iran (30%), Netherlands (7%), Sri Lanka (4%), Thailand (4%) and USA (4%). In 2020, India imported only 1 MT of strawberries from Turkey.

Exhibit 105: Major Countries Exporting to India (2019)



	CAGR (2014-2019)	Percent Share to Indian strawberry Imports	Country Percent to Global Trade Country/ Rank to Global Exports
Argentina	77%	50%	Negligible (~0%) Rank:68
Iran	NA	30%	Negligible (~0%) Rank:61
Netherlands	-50%	07%	10% Rank:4
USA	-82%	04%	17% Rank: 3
Thailand	15%	04%	Negligible (~0%) Rank:84
Sri Lanka	-13%	04%	Negligible (~0%) Rank:62

*Source: ITC Trade Map, *where data for 2014 is not available the latest year has been taken for CAGR calculation*

3.16.4. Strawberries-Phytosanitary Requirements and Potential for Import from Brazil

India presently does not allow imports of strawberries from Brazil as per the Plant Quarantine (Regulation of Import into India) Order, 2003.

Potential for Import in India-Strawberries

Fresh strawberries offer opportunity mainly through air cargo. However, financial feasibility of the same from Brazil should be analysed.

Frozen/processed strawberries can offer higher potential for India.

3.18. Carambolas (Averrhoa Carambola), Annonas, Lychee and Others (081090)

3.18.1. Carambola Production and Trade

Individual trade data related to Carambola is not available on online portals considering its small quantity in global trade. Hence most of the analysis is based on combined data under the HS code 081090 consisting of Carambolas (Averrhoa Carambola), Annonas, Lychee and Others.

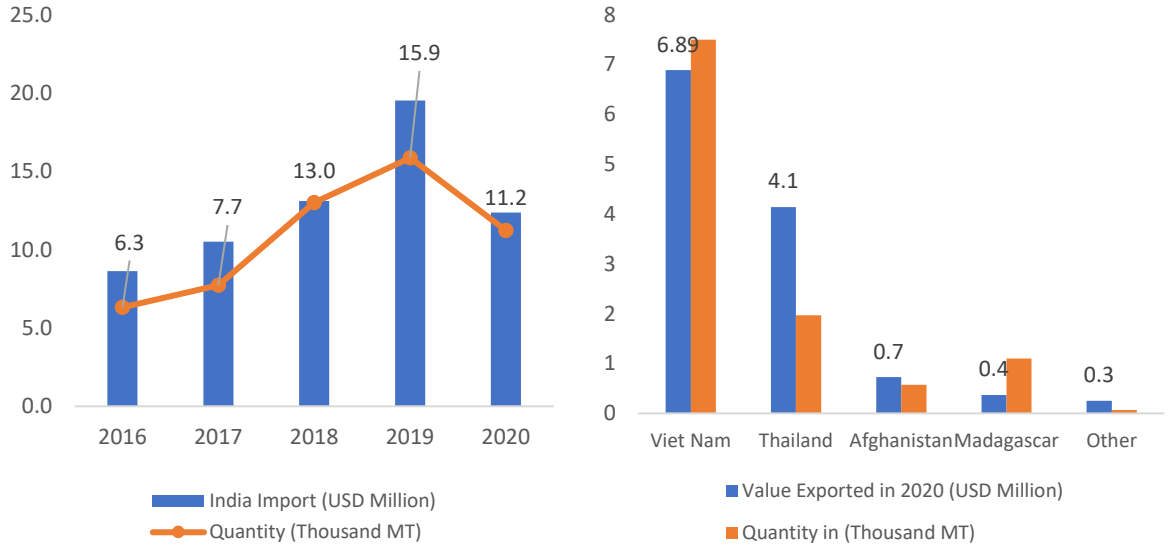
India in 2020, imported 11235 MT of fruits under HS code 081090 worth USD 12.38 million majorly from Vietnam (55.6%), Thailand (33.5%), and Afghanistan (5.9%).

On the export front India in 2020 exported 80890 MT of HS 081090 fruits worth USD 89.88 million. The major markets included UAE (26%), Bangladesh (20%), Netherlands (8%) and Saudi Arabia (6%) in terms of value. The exports from India have been increasing at a CAGR of ~7% in value terms in the last decade.

Carambola trees (grafted) will be ready for harvesting the fruits in 1 to 2 years whereas the seedling can take about 4 years. Usually these trees bear fruits all-round the year, but peak stage is during Jan to Feb & Sept to Oct months.

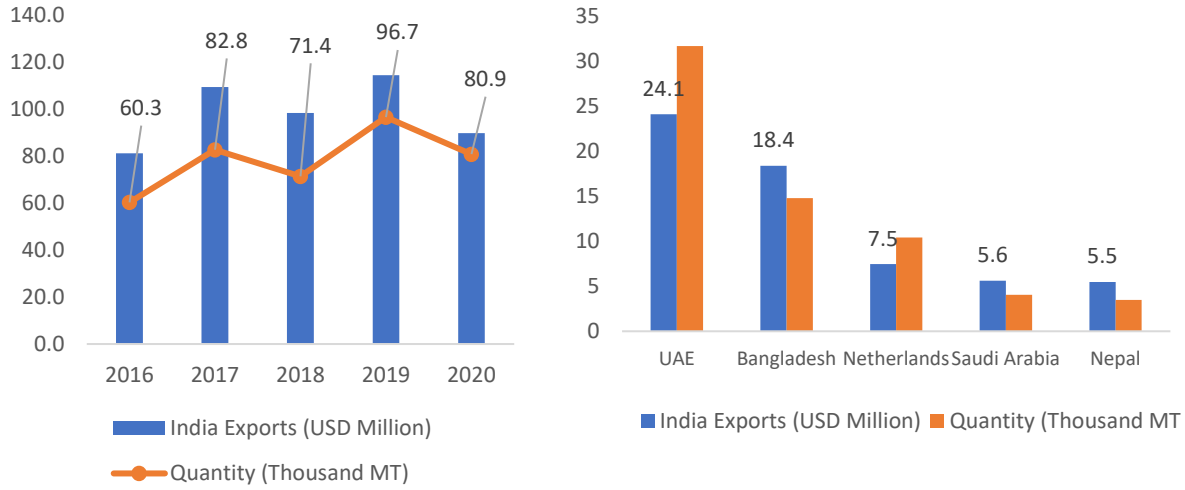
India imported 11,235 MT (HS code Product: 081090 Fresh tamarinds, cashew apples, jackfruit, lychees, sapodilla plums, passion fruit, carambola etc in 2020, value of the import was 12,382 Thousand USD)

Exhibit 106: Import Trends of Carambolas and major partners



Source: ITC Trade Map

Exhibit 107: Export Trends of Carambolas and major partners

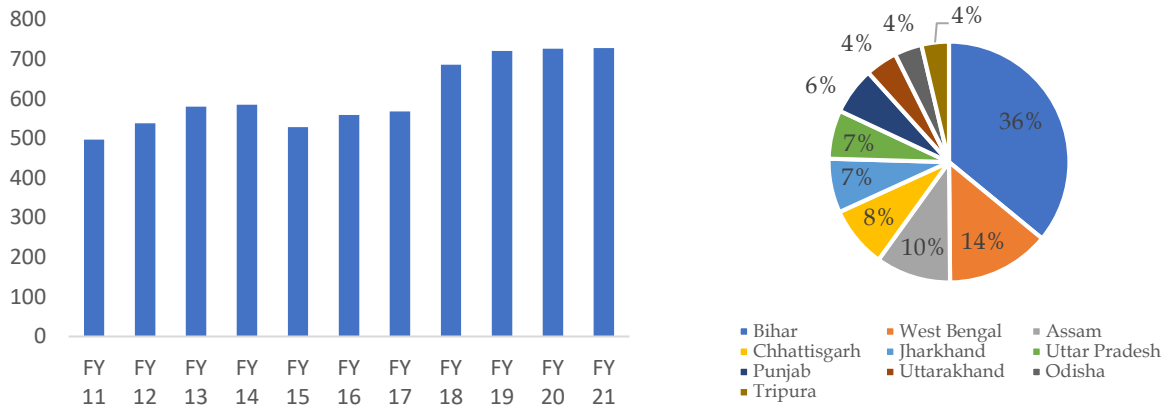


Source: ITC Trade Map

3.18.2. Lychee Production

India's Lychee production in FY21 was estimated at 0.728 million MT, which has been growing at a CAGR of 3.83% over the last decade (F11-FY21). India is the largest producer of lychee globally. India's average lychee productivity in 2020-21 was 7.4 MT/ha. The major lychee growing states in India are Bihar (35%) West Bengal (14%), Assam (10%), and Chhattisgarh (8%)

Exhibit 108: India's Lychee Production Trend over last 10 years (000 MT); Major Production States



Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India

India has been gifted with unique ripening pattern of litchi, as litchi starts ripening from 15th April in Tripura, 1st week of May in Assam and West Bengal; 3rd week of May in Bihar & Jharkhand, and season ends after ripening terminates in Punjab in last week of June. Thus, India has 2.5 months' time to export litchi.

Exhibit 109: Harvesting Seasons (in green)

STATE/UT'S	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Tripura												
Assam												
West Bengal												

Bihar												
Jharkhand												
Uttarakhand												

Source: http://apeda.in/agriexchange/Marketpercent20Profile/one/LITCHI.aspx

The major lychee varieties grown in India are as follows:

Exhibit 110: Major lychee varieties grown in India

State	Varieties
Bihar & Jharkhand	China, Deshi, , Purbi, Early & Late Bedana, Mclean, Muzzaffarpur, Rose Scented, Shahi, Kasba
Orissa	Muzaffarpur, Bombai, China
Punjab & Haryana	Saharanpur, Dehradun, Calcuttia, Muzaffarpur, Seedless (Late) & Rose Scented
Uttaranchal	Rose Scented, Calcuttia, Early & Late Seedless
Uttar Pradesh	Seedless Early, Seedless Late, Early Large Red, Late Large Red, Calcutta, Rose Scented, Dehradun
West Bengal	Muzaffarpur, China, Deshi, Purbi, Elachi Early, Elachi Late, Bombai, Goothi, Bedana, Potee, Kalyani Selection

Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India

Availability of lychee is largely only in Delhi w.r.t other key markets. In Delhi its available between May to July, with the price peaking in May. The peak wholesale and retail prices for Delhi market reached about INR 78.56/Kg and 155.38/Kg. Lowest prices were recorded in the month of July.

Exhibit 111: Wholesale Price Trends for Lychee in 2019 in Delhi (INR/100kg)

Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India

Exhibit 112: Retail Price Trends for Lychee in 2019 in Delhi (INR/kg)

Source: National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India

3.18.3. Lychee Trade

India is the largest producer of lychee globally. In 2020, India produced 0.728 million MT of lychee and imported around 0.314 million MT (worth 5.8 Lakh USD) from Netherlands (27%), Belgium (22%), Turkey (17%), and Canada (12%).

On the export front India last exported only 315 MT of Lychee in 2011-12 against production of 0.48 Mn MT.

A substantial amount of lychee produced in the country is consumed locally. Lychee, being highly perishable, is available for very short duration. Marketing of fruits is done in different forms. Growers rent their orchards to contractors, who in turn harvest and sell to local markets.

3.18.4. Trade Partners

India does not import Lychee.

3.18.5. Profile of Competition and Value Chain Analysis (Primary Survey)

A substantial amount of lychee produced in the country is consumed locally. Lychee, being highly perishable, is available for very short duration. Marketing of fruits is done in different forms. Growers rent their orchards to contractors, who in turn harvest and sell to local markets.

In chains of marketing increased numbers of middlemen reduces the share of growers in the price of produce paid by consumers. Generally, for the domestic market lychee is packed in 10 kg boxes or baskets having a lining of lychee leaves. There has been considerable importance given to the packing of lychee for niche domestic markets. Now lychee is packed in 2-2.5 kg boxes and transported in cold chain.

In the last few years serious attempts have been made to export lychee from India. Test consignments were initially sent by air and the technology for sea transport has also been perfected. The exportable lychee is packed in 2 to 2.5 kg or 5 to 6 kg boxes after sulphur treatment. Quality standards are managed as per the standard developed by APEDA. The strong cooperative marketing and infrastructure facilities developed are expected to promote marketing of lychee.

3.18.6. Carambolas, Annonas, Lychee Phytosanitary Requirements and Potential for Import from Brazil

India presently does not allow imports of Carambolas and Lychees from Brazil as per the Plant Quarantine (Regulation of Import into India) Order, 2003.

Potential for Import in India- Carambolas, Annonas, Lychee etc.

Carambolas, Annonas are gaining increasing importance in India. Brazil exporters can focus on few boxes in their regular fruit cargo.

3.19. Airelas Blueberries and Other Fruits Gen. Vaccinium and Persimmons (Diospiros) (081040 and 081070)

3.19.1. Airelas Blueberries and Other Fruits Gen. Vaccinium

India blueberries production is very limited and there is very limited data available on the same.
India imported 43 MT of Fresh cranberries, blueberries and other fruits in 2020 with a value of USD 395 thousand, mainly from Chile (84%), Netherlands (14%) and Canada (2%). India exports minimal quantity of this category globally (1 MT). The imports have significantly grown in last three years which was 6 MT in 2018, 82 MT in 2019 and 43 MT in 2020. Growth in imports have increased by 207% by value and 156% by volume between 2016-20.
India exports minimal quality of fresh cranberries and blueberries which is around USD 1 thousand averaging 1 MT.

3.19.2. Persimmons (Diospiros)

There is also very limited amount of data for persimmon production in India.
India imported persimmons with a value of USD 130 thousand in the year 2020, which was slightly lower than imported value of USD 203 thousand in 2019 and around and average of USD 90 thousand in 2019 and 2018.

3.19.3. Blueberries, Vaccinium, Persimmons-Phytosanitary Requirements and Potential for Import from Brazil

India presently does not allow imports of Blueberries and Persimmons from Brazil as per the Plant Quarantine (Regulation of Import into India) Order, 2003.

Potential for Import in India- Blueberries, Vaccinium, Persimmons etc.

Opportunity for import through air cargo and consumption is increasing in urban centres. Indian production is minimal. There is potential to import frozen berries etc. in India.

3.21. Avocado (080440)

3.21.1. Avocado Production & Trade

India may not be considered a producer of avocado considering its miniscule quantity grown in the country. In 2020, India imported 418 MT (worth 13.25 Lakh USD) of avocado majorly from Netherlands, Peru and New Zeeland.

On the export front India exported only 1 MT of avocados worth USD 5000 in 2020. The major markets included Qatar and UK. With respect to avocado trade in 2020, India was ranked 99th with the share in export of ≈ 0% and 63rd with the share in import of ~0%.

With respect to global trade Mexico has the highest export share in terms of value (@40% USD 2.7 Bn) followed by Netherlands (@ 15% USD 1.06 Bn) and Peru (@ 14.5% USD 1 Bn).

Notable exporters of avocados are Mexico, Chile and Peru. In terms of the European market, Chile and Peru also export avocados to the EU, but their harvest season lasts for only two months, which is much shorter than Mexico that covers ten months during the year. Moreover, buyers prefer Mexican avocados since the price is lower due to its large supply volume. For instance, although Korea has FTAs with Chile and can import Chilean avocados without tariffs, importing Mexican avocados with tariffs is still nearly 30% cheaper. In terms of quality, there is not definite difference between Mexico, Chile, and Peru but Mexico is certainly the most competitive in terms of price. Even with tariffs imposed on Mexican avocados, they remain cheaper than other countries.

Production / Export level have been the lowest in 2020 due to the climate issue. Strong domination by few key players in the market, 80% big players vs 20% small/medium players. Quite mature and saturated supply market as the big players only get bigger. Domestic consumption is increasing significantly, suppliers' sales preference slowly shifting towards the domestic market.

3.21.2. Avocado-Phytosanitary Requirements and Potential for Import from Brazil

India presently does not allow imports of avocado from Brazil as per the Plant Quarantine (Regulation of Import into India) Order, 2003.

Potential for Import in India-Avocado

Although imports of avocado is low in India, it is consumed in urban centers and demand is picking up. Indian avocado is around one fourth the price of imported avocado. Opportunity to enter avocado in India, as some boxes of avocado can be tested in Indian market with full container load of apple/citrus. Initially avocado can be imported by air cargo.

Ministry of Agriculture, Livestock and Food Supply of Brazil is negotiating process with Indian Ministry of Agriculture and NPPO India on phytosanitary requirements for Avocado.

4. Regulation & Policy for Overall Fruit Sector

This chapter provides an overview of the regulatory and policy regime in India for import of fresh fruits. It covers import procedures, documentation requirements, trade agreements, phytosanitary requirements, tariffs as well as India's domestic policy for horticultural production and marketing.

4.1. India's Food Trade Import Procedures

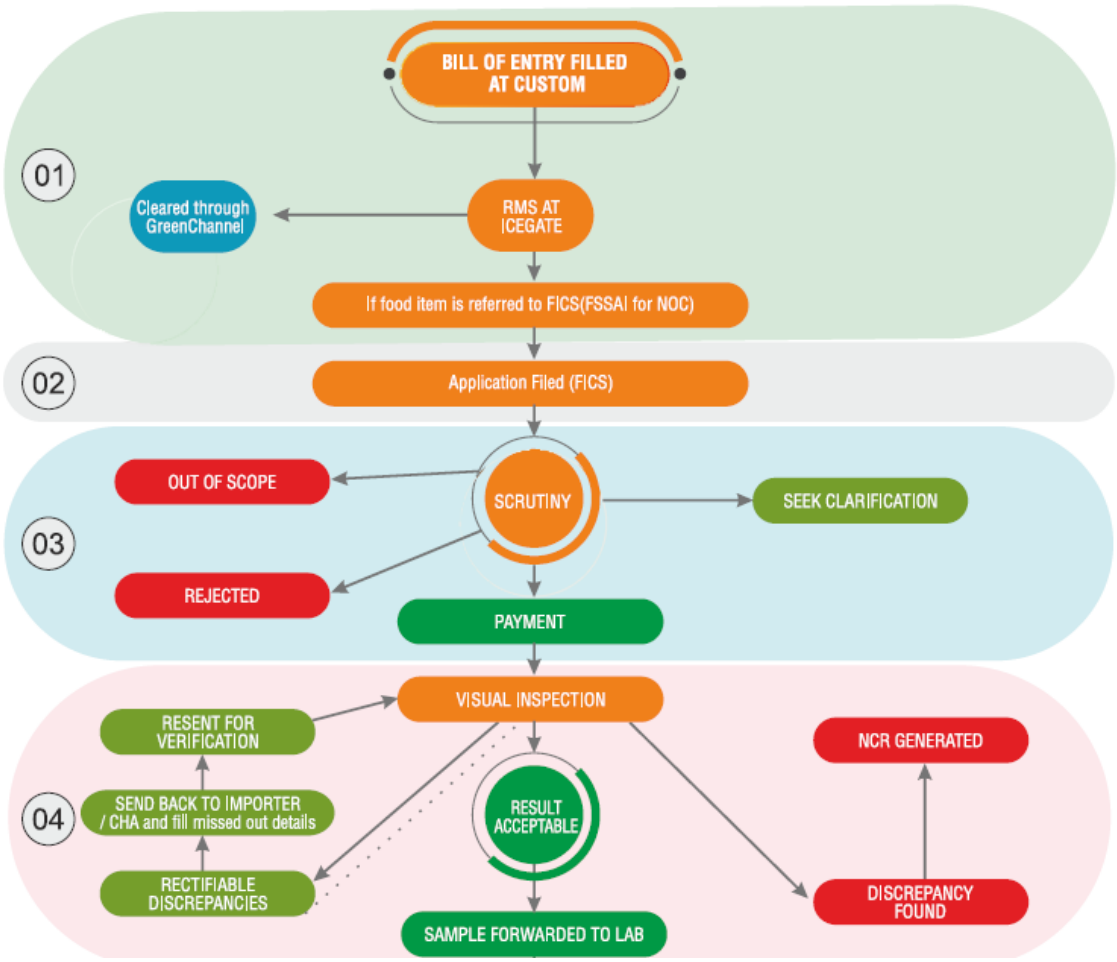
Import of fresh fruit consignments must be accompanied with a Phytosanitary Certificate (PCS) that has been mutually agreed between the importing and exporting countries. The overall trade procedure to import[14] food into India is as follows:

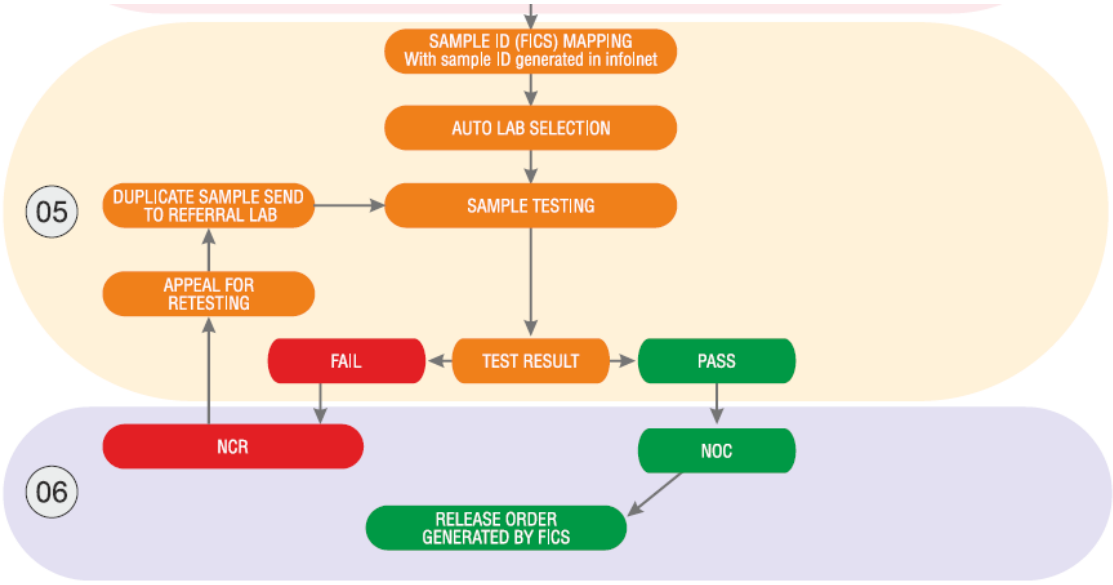
1. Bill of Entry (BOE) is filed at Customs ICE GATE (https://icegate.gov.in) on Single Window Interface for Facilitating Trade (SWIFT). SWIFT is working on Risk based sampling system, called as Risk Management System (RMS).
2. Risk Management System (RMS) scrutinizes the application and if the sampling is required; the BOE is referred to Food Safety and Standards Authority of India (FSSAI) on online Food Import Clearance System (FICS).
3. Custom House Agent (CHA)/Importer needs to be registered on FICS (www.ics.fssai.gov.in).
4. FSSAI accepts the BOE and may ask for further details from CHA/Importer, if necessary.
5. If all the relevant information is provided, Authorized Officer (A.O) fixes appointment for the inspection of the consignment (only two opportunities are provided to the CHA/Importer to confirm the appointment).
6. On inspection, if everything is found satisfactory including labelling and packaging requirements of the consignments, the samples are drawn (2 numbers) and if not, Authorised Officer rejects the consignment and issues Non-Conforming Report (NCR).
7. Samples are then sent to FSSAI Notified Food Laboratory. If sample is found conforming, then No Objection Certificate (NOC) is generated and if not conforming, then Non-Conforming Report is generated, rejecting the clearance of food consignment.
8. In respect of imported articles of food having shelf-life less than seven days, the applicant shall declare the same in FORM - 13 allowing the Authorised Officer to draw sample and issue provisional no objection certificate to the customs, without waiting for the analysis report from laboratory and on receipt of the report analysis from the laboratory, the Authorised Officer shall communicate to the customs along with no objection certificate if products conform to the standard. For fresh fruit consignments, the timeline for Plant Quarantine activities for import of fresh fruits is 4-6 hrs. In practice, clearance may take up to 2-3 days.

[14] FAQs_Import.pdf (fssai.gov.in)

9. In case of non – conformance of the sample, the Authorised Officer shall immediately inform the Importer or Custom Broker, to initiate recall of that consignment and submit a compliance report as specified in the Food Safety and Standards (Food Recall Procedure) Regulations, 2017.
10. If Importer does not agree with the finding of the laboratory report, he may apply for retesting at the referral laboratory. Outcome of test result will determine fate of the consignment. Importer may present the review application to the Review Officer (Director, Imports) along with the required documents at the FSSAI Headquarter.
11. The order passed by the Review Officer can be challenged before the CEO, FSSAI whose decision thereon will be final.

Exhibit 113: FSSAI Import Clearance Procedure





4.1.1. Mandatory Documents for Importing Food[15]

Documentation is a key aspect of the import procedure in India which has been increasingly rationalised and made more efficient. Presently, 21 key documents are required to import any food product in India.

1. Import- Export Code from DGFT and Import License from FSSAI
2. Country of Origin Certificate Mandatory Document(s) as applicable
3. Phytosanitary certificate
4. High Sea Sales Agreement
5. Bill of Lading mentioned in the Bill of Entry (BoE) for sea consignment
6. Ingredients
7. Specimen copy of label
8. Declaration that BoE has not been referred on SW (Declaration is required to be in company letterhead.)
9. Examination Order
10. Transit countries list if Food Articles have been transhipped
11. Invoice/Proforma Invoice
12. Packing List Self Declaration Document(s) As Applicable
13. Undertaking from importers for issue of provisional NOC for imported food consignment with less than 07 days shelf life
14. Undertaking from importers for issue of provisional NOC for frozen & chilled imported food consignment
15. Undertaking from importers for imported food consignment meant for Display Purpose in Trade Fair/Exhibition
16. Undertaking from importers for imported food consignment meant for Personal Use

[15] FAQs_Import.pdf (fssai.gov.in)

17. Undertaking from importers for imported food consignment meant for Research & Development purposes
18. Undertaking from importers for imported food consignment meant Sports Events
19. Undertaking from importers for imported food consignment containing bulk packages but not having representative samples
20. Undertaking from importers for imported food consignment containing bulk packages and having representative samples
21. Undertaking from importers for imported food consignment meant 100% Export and Re-export

The FSSAI NOC is exempted for imported food by submitting an undertaking only in the following conditions:

1. Articles of food imported for personal consumption
2. Imported food consignment meant for Display Purpose in Trade
3. Fair/Exhibition
4. Imported food consignment meant for Research & Development purposes
5. Imported food consignment meant Sports Events
6. Imported food consignment meant 100% Export and Re-export

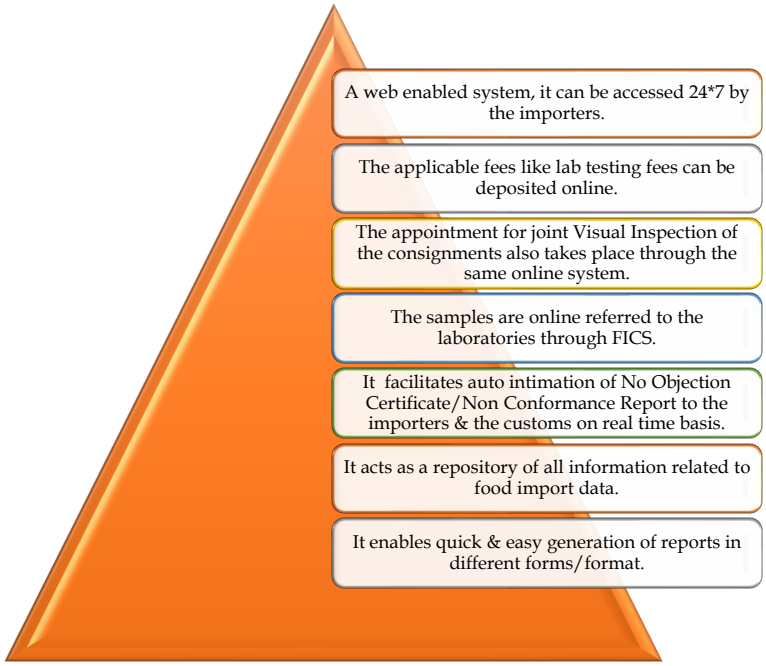
The imported consignments of food items having shelf life of less than 7 days and food which requires special storage conditions can be issued a Provisional NOC, without waiting for the analysis report from lab based on an undertaking from the importer as prescribed by FSSAI.

In June 2015, India announced a plan to transition its imported food inspection protocol from batch-by-batch inspections and sampling to a risk-based approach. Along with SWIFT, the Central Board of Excise and Customs (CBIC) also introduced an Integrated Risk Management facility for partner government agencies to ensure that consignments are selected for testing based on the principle of risk management, ensuring that foods that present actual food safety risks are tested while goods that pose little to no risk can avoid unnecessary procedures by inspection agencies.

The Food Import Clearance System (FICS)[16] is an online system by FSSAI, which is integrated with the customs ICE Gate (i.e. Indian Customs Electronic Commerce/Electronic Data interchange (EC/EDI) Gateway) through SWIFT (i.e. Single Window Interface for facilitating Trade) to allow a single window interface that provides an opportunity to the importers to file an application for easy clearance of food consignments. The key benefits of FICS are mentioned in the exhibit below.

[16] Food Regulatory Portal - One Nation, One Food Law (fssai.gov.in)

Exhibit 114: Key Benefits of FICS



Source: FSSAI, YES Bank Analysis

4.2. India's Food Import Regulations

In India, imported food products are often subject to multiple regulatory authorities with overlapping powers. The two key regulatory authorities are the Food Safety and Standards Authority of India (FSSAI) and Directorate of Plant Protection, Quarantine & Storage. Food Safety and Standards Authority of India (FSSAI) is a statutory body established under the Ministry of Health & Family Welfare, Government of India, by virtue of the Food Safety and Standards Act, 2006. The Act is a consolidating statute related to food safety and regulation in India. FSSAI is responsible for protecting and promoting public health through the regulation and supervision of food safety.

There are two key Acts and subsuming regulatory orders governing imports for specific purposes or categories:

1. **The Plant Quarantine (Regulation of Import into India) Order (2003)**

   [17]The Plant Quarantine (Regulation of Import into India) Order (2003) under the Destructive Insects and Pests Act (1914) governs plant import regulations with "the purpose of prohibiting and regulating the imports into India of agricultural articles" and became effective January 1, 2004. The implementing agency is the Directorate of Plant Protection, Quarantine, and Storage (DPPQS), under the Ministry of Agriculture and Farmers' Welfare. All fruits imported into India must comply with the phytosanitary conditions stipulated under this Order.

   - Schedule IV of the PQ Order provides a list of plants/planting materials and countries from where import is prohibited along with justification

[17] pqorder2015.pdf (plantquarantineindia.nic.in)

- Schedule-V of the PQ Order provides a list of plants and plant materials restricted import permissible only with the recommendation of authorized institutions with additional declarations and special conditions
- SCHEDULE – VI of the PQ Order provides a List of plants/plant materials permitted to be imported with additional declarations and special conditions
- Schedule VII of the PQ Order provides a list of plants/planting materials where imports are permissible based on phytosanitary certificate issue by the exporting country, the inspection conducted by inspection authority and fumigation, if required, including all other general conditions.
- With respect to the shortlisted fruits in the recent study, figs are under schedule VII, whereas all other fruits are in schedule VI.
- Every consignment of plant species herein specified in Schedule-V, VI and VII shall be accompanied by an original Phytosanitary Certificate issued by the authorized officer at country of origin or Phytosanitary Certificate for re-export issued by the country of re-export along with attested copy of phytosanitary certificate from country of origin, as the case may be, with the additional declarations being free from pests mentioned under Schedule-V and VI of this order or that the pests as specified do not occur in the country or state of origin.
- No import shall be permitted for the consignment other than those listed in Schedule-V, VI and VII unless the Pest Risk Analysis is carried out. For this purpose, the importer or National Plant Protection Organization (NPPO) of exporting country shall apply for PRA for import of agricultural commodities into India in form PQ 23, including the technical information in form PQ 24 for conducting PRA to PPA or Joint Secretary (PP). The technical information must be updated, validated, and provided by NPPO of the exporting country. The process of PRA involves the categorization of pests associated with the commodity into quarantine pests; evaluation of their introduction potential; critical assessment of economic and environmental impact of their introduction and spread; and specification of risk mitigating measures against them. The completion of PRA process shall involve the visit of phytosanitary experts to the country of export to carry out pre-shipment inspections, evaluate post–harvest treatment technologies and quarantine inspection and certification facilities.
- On arrival, at the first point of entry the consignment shall be inspected by the Plant Protection Adviser or any other officer duly authorized by him in this behalf and appropriate samples shall be drawn for laboratory testing, in accordance with the guidelines issued by Plant Protection Adviser from time to time. The Plant Protection Adviser or the officer authorized by him may, after inspection and laboratory testing, fumigation, irradiation, disinfection or disinfestation, as may be considered necessary by him, accord quarantine clearance for the entry of a consignment or grant provisional clearance for growing under post-entry quarantine, as the case may be in form PQ 16 and or order deportation or destruction of the consignment in form PQ 17 in the event of non-compliance with the restrictions and conditions specified in this Order.

2. **FSSAI**

The Food Safety and Standards Act (2006) is the main law for food safety and standards in India.

- The FSSAI's Food Safety and Standards (Import) Regulation, 2017 is specifically meant for food imports. Additionally, two more regulations determine standards and tolerance limits.
- The Food Safety and Standards (Contaminants, Toxins and Residues) Regulations, 2011 of the FSSAI lay down maximum tolerance limits for agrochemical residues (as placed in the Annexures 1 of this this report).
- The Food Safety and Standards (Food Products Standards and Food Additives) Regulations, 2011 lay down rules regarding coatings and Food Additives Regulations for All Fresh Surface Treated Fruits (reproduced in Annexures 1 of this report).

All Food Business Operators including food importers need a license from FSSAI. Under Regulation 2.1.7 (1) of FSS (Licensing and Registration of Food Businesses) Regulations 2011, a license granted under these Regulations shall be valid and subsisting, unless otherwise specified, for a period of 1 to 5 years as chosen by the Food Business Operator, from the date of issue of license subject to remittance of fee applicable for the period and compliance with all conditions of license. On September 11, 2017, India published its new product approval procedures in the Official Gazette of India (Food Safety and Standards (Approval for Non-Specified Food and Food Ingredients) Regulations, 2017).

4.3. Trade Agreements and Trade Barriers

India has a range of bilateral and regional trade agreements in force, including several free trade agreements (FTA) and preferential trade agreements (PTA). These agreements include the Asia Pacific Free Trade Agreement; a series of India–Africa Agreements with 19 African nations, the Agreement on Trade in Goods between Indian and the Association of South East Asian Nations (ASEAN), and the South Asian Free Trade Area (SAFTA). India also has trade arrangements with the European Free Trade Association (Iceland, Liechtenstein, Norway, and Switzerland) and a PTA with MERCOSUR (Argentina, Brazil, Paraguay, and Uruguay).

The India – MERCOSUR PTA came into effect from 1st June 2009. MERCOSUR is a trading bloc in Latin America comprising Brazil, Argentina, Uruguay and Paraguay. MERCOSUR was formed in 1991 with the objective of facilitating the free movement of goods, services, capital and people among the four member countries. The aim of this Preferential Trade Agreement is to expand and strengthen the existing relations between MERCOSUR and India and promote the expansion of trade by granting reciprocal fixed tariff preferences with the ultimate objective of creating a free trade area between the parties.

Under the India-MERCOSUR PTA, the major products covered in the Indian offer list are meat and meat products, organic & inorganic chemicals, dyes & pigments, raw hides and skins, leather articles, wool, cotton yarn, glass and glassware, articles of iron and steel, machinery items, electrical machinery and equipment, optical, photographic & cinematographic

apparatus. Fruits are not covered in the list. The major product groups covered in the offer list of MERCOSUR are food preparations, organic chemicals, pharmaceuticals, essential oils, plastics & articles, rubber and rubber products, tools and implements, machinery items, electrical machinery and equipment.

India Tariff and Import Duties for Fruit

India's tariff regime is characterized by large disparities between WTO bound rates and Most Favoured Nation (MFN) applied rates. Given this large disparity between WTO bound and applied rates, India has considerable flexibility to change tariff rates at any time. Yet, India's average MFN applied tariff rate of 17.1% remains the highest across the world. India's average MFN applied tariff rate was 38.8% for agricultural products and 13.6% for non-agricultural products in 2018 (latest data available). In addition to tariffs, in 2018 India implemented a 10% social welfare surcharge on imports, except certain products exempted pursuant to an official customs notification. A landing fee of 1% is included in the valuation of all imported products unless ex**e**mpted through separate notification.

The Customs Act of 1962 governs import (and export) tariffs and sets the rules for customs valuation. India's tariff system is based on the Harmonised System of Nomenclature (HSN) of the Customs Co-operation Council. Prior to the introduction of the Goods and Services Tax (GST) in July 2017, India maintained a complex and opaque system of taxes, whereby imports were subject to state-level taxes, the Central Sales Tax, and various local charges. The GST has immensely simplified the tax regime by unifying India into a single market and improving the ease of doing business.

The calculation of import duty has three variable values, basic customs duty, social welfare surcharge and the IGST:

- *Basic Customs Duty (BCD):* This is the tax that is calculated on the Assessment Value of the goods that have landed at the customs border of India. It can vary between 0% to 100%. BCD depends upon the HSN code of the product and the Country of Import. BCD for HSN codes is revised from time-to-time and revised duties are published as notifications on the website of Central Board of Indirect Taxes and Customs within the Ministry of Finance's Department of Revenue.
- *Social Welfare Surcharge (SWS):* It is a tax imposed on the value of goods including the BCD value. It is generally 10% unless the good is exempted from this tax.
- *Integrated Goods & Services Tax (IGST):* Introduced on 1 July 2017, IGST is imposed on the imported goods to provide a level playing field for domestic manufacturers, who also pay an equivalent tax (Central GST + State GST or IGST) on sale of goods. IGST on imported goods can be set-off against any other GST liability in India. There are five slabs of IGST 0%, 5%, 12%, 18%, 28%. IGST on imports is assessed on the sum of the customs value of the goods and the customs duties assessed on those goods, thereby amplifying the effect of customs tariff rate increases.
  For fresh fruits imports, IGST is nil.

The effective, applied duty rates for the shortlisted fruits in the present report are presented in the exhibit below. Import of fruits into India is flourishing due to growing demand from

urban consumers. Barring apple which commands 75% basic custom duty, the other fruits are either in the 30% category for imports from Brazil.

Exhibit 115: Basic Customs Duty as Per Indian Trade Portal, GoI

Crop	Basic Customs Duty as Per Indian Trade Portal, GoI
Banana	30%
Plantains	30%
Figs	30%
Pineapples	30%
Avocado	30%
Guava	30%
Oranges	30%
Mandarins	30%
Lemon/Lime	30%
Grapes	30%
Watermelon	30%
Melons	30%
Papaya	30%
Apple	75%
Pears	30%
Peach	30%
Strawberry	30%
Blueberry	30%
Persimmons	30%
Carambola etc.	30%

Source: Indian Trade Portal, Department of Commerce, Ministry of Commerce and Industry

Most import items fall within the scope of India's EXIM Policy regulation of Open General License (OGL). This means that they are deemed to be freely importable without restrictions and without a license, except to the extent that they are regulated by the provisions of the Policy or any other law. Imports of items not covered by OGL are regulated and fall into three categories: banned or prohibited items, restricted items requiring an import license, and "canalized" items importable only by government trading monopolies and subject to Cabinet approval regarding timing and quantity.

A list of banned/ restricted products in India is provided by DGFT (Ministry of Commerce and Industries) and can be obtained from their website. However, the FSSAI may prohibit/restrict import of any article of Food based on risk perception or outbreaks of disease, etc. and issue orders as deemed fit in this regard. The Food Authority may issue guideline(s)/order(s) as deemed necessary from time to time for ensuring the safety and wholesomeness of Food imported into India. FSSAI must inform customs of all such prohibitions and restrictions.

4.4. Favorable Domestic Horticultural Policy Production Growth

India has a composite structure of rules, laws, regulations and authorities addressing its horticultural sector, spread across the central government and state government level. Horticulture, like agriculture, by and large remains a state subject. Yet, the central government plays a critical role in policy making and funding of various schemes to promote horticulture. Accordingly, the state governments implement central schemes and plans (often supplementing the funds) and remain the key actor between the central government and farmers/beneficiaries.

The National Horticulture Board (NHB) was set up by Government of India in April 1984 with the objective to improve integrated development of the horticultural industry and to help in coordinating, sustaining the production and processing of fruits and vegetables. NHB implements various schemes under Mission for Integrated Development of Horticulture (MIDH) in all states and UTs of India, with the main schemes including:

- Development of Commercial Horticulture through Production and Post-Harvest Management of Horticulture Crops
- Capital Investment Subsidy Scheme for construction/ expansion/ modernization of Cold Storages/Storages of Horticulture Products
- Technology Development and Transfer for promotion of Horticulture
- Market Information Scheme for horticulture Crops
- Horticulture Promotion Services / Expert Services

The Mission for Integrated Development of Horticulture (MIDH) is a Centrally Sponsored Scheme launched in 2014 for the holistic growth of the horticulture sector covering fruits, vegetables, root & tuber crops, mushrooms, spices, flowers, aromatic plants, coconut, cashew, cocoa and bamboo. The MIDH subsumes all previous schemes relating to promotion of horticulture in India with the following stated objective:

- ✓ Holistic growth of horticulture sector through area based regionally differentiated strategies.
- ✓ Improve productivity by way of quality germplasm, planting material and water use efficiency through Micro Irrigation.
- ✓ Enhance horticulture production, augment farmer's income and strengthen nutritional security
- ✓ Aggregation of farmers into farmer groups like FIGs/FPOs
- ✓ Skill development and creation of employment opportunities

Under MIDH, Government of India (GOI) contributes 60%, of total outlay for developmental programmes in all the states except states in North East and Himalayas, 40% share is contributed by State Governments. In the case of North Eastern States and Himalayan States, GOI contributes 90%. In case of National Horticulture Board (NHB), Coconut Development Board (CDB), Central Institute for Horticulture (CIH), Nagaland and the National Level Agencies (NLA), GOI contributes 100%. MIDH also provides technical advice and administrative support to State Governments/ State Horticulture Missions (SHMs) for the

Saffron Mission and other horticulture related activities Rashtriya Krishi Vikas Yojana (RKVY)/NMSA.

Some of the major components of MIDH schemes include the following:

- Nursery and Quality Planting material
- Area expansion
- Protected Cultivation: poly-house, green-house, shade-nets, for growing off -season high value vegetables and flowers
- Water Harvesting Structure -Farm ponds: Individual and community
- Horticulture Mechanization
- Post-Harvest Infrastructure
- Cleaning/Sorting /Grading/Packing units
- Cold Chain
- Primary Processing
- Capacity Building of farmers
- Beekeeping
- Centre of Excellence (CoEs)

The Central government runs several schemes through its various ministries offering grants and subsidies to the horticultural industry for both fresh and processed fruits & vegetables. Some of the key grant schemes which can be availed are highlighted below:

- *Integrated Cold Chain and Value Addition Infrastructure (by Ministry of Food Processing Industries)*- Envisages linking groups of producers to the processors and market through well-equipped and adequate cold chain infrastructure. It provides 35-50% subsidy (up to INR 10 crores) **for storage & transportation infrastructure,** for value addition and processing infrastructure and for irradiation facilities.
- *Creation/Expansion of Food Processing and Preservation Capacities (by Ministry of Food Processing Industries*) – It provides 35-50% subsidy (up to INR 5 crores) for setting up horticultural processing units in Mega Food Parks across the country.
- *Infrastructure for Agro-Processing Clusters (by Ministry of Food Processing Industries*)– to set up a cluster providing basic enabling and core infrastructure to help establish at least five captive or non-captive processing units within the agro cluster. It provides 35-50% subsidy (up to INR 10 crores)
- *Backward and Forward Linkages (by Ministry of Food Processing Industries*)- provides grants for setting up backward linkages such as Integrated Pack-house(s) (with mechanized sorting & grading line/ packing line/waxing line/ staging cold rooms, etc.) as well as forward linkages such as Ripening Chamber(s), retail chain of outlets for perishables including Refrigerated /insulated transport / Reefer Vans. It provides 35-50% subsidy (up to INR 5 crores).
- *Operation Green (TOP Scheme) (by Ministry of Food Processing Industries*) – With a total budgetary allocation of Rs. 500 Crore, this scheme is meant for the integrated development of Tomato, Onion and Potato (TOP) value chain. This scheme provides subsidies for short term price stabilization measures (Transportation & Storage – 50% subsidy), as well as for long term integrated value chain development projects (grant

up to INR 50 crores) which enable FPO formation and set up nurseries, tissue culture laboratories and post-harvest processing facilities.

- *The Cluster Development Programme (CDP) (by National Horticulture Board*) is designed to leverage the geographical specialization of horticulture clusters and promote integrated and market-led development of preproduction, production, post-harvest, logistics, branding, and marketing activities. MoA&FW has identified 53 horticulture clusters, of which 12 have been selected for the pilot launch of the Programme. Financial Assistance of up to INR 100 crores will be provided by National Horticulture Board to the Implementing Agencies through CDAs appointed for the respective Clusters.
- *Setting Up/Up-gradation of Quality Control/Food Testing Laboratories (by Ministry of Food Processing Industries*) – Under the scheme, organizations/universities are eligible to receive financial assistance for setting up of food testing laboratories. Grant-in-aid is also given to food processing companies in the form of re-imbursement of expenditure towards implementation of HACCP/ ISO Standards/ Food safety/ Quality Management Systems @ 50% in general area and @ 75% in NE Region and difficult areas of eligible project cost subject to maximum of INR 1.7 million and INR 2.2 million respectively.

5. Conclusion

5.1. Summary Outcomes of Selected Crops

Based on the research findings from the primary survey, a summary of opportunities for export from Brazil are presented below. The below matrix will help in evaluating crops which can be of key focus for Brazilian exporters.

Shortlisted Fruits	India Production Strengths (High/Medium/Low)	Indian Imports in 2020 (Quantity)	Import CAGR in value (2010-2020)	Competitor Mapping	Summary
Apples	**Medium** 2,057 thousand MT (2,814 MT in FY 20) production; Able to cater to only seasonal demand during harvest season; production has been declining over the years. CA storage infrastructure is a recent phenomenon, with only few players storing for off season.	201.3 thousand MT	5.2%	USA, Turkey, Italy, Chile, New Zealand, Iran, Afghanistan. Fruit imports from China has been banned since May 2017 and there is an additional 20% duty for imports from USA.	High opportunity to cater to off-season demand of India from March-September. Import from Brazil has been growing in India, and Brazil being a major exporter can cement significant market share in Indian apple imports
Citrus	**High** 14,071 Thousand MT; India is third largest citrus producer in the world	44.7 thousand MT	13.5%	India imports Citrus from Egypt, South Africa and Australia.	Brazil has a high opportunity to enter Citrus trade in India during the off season. Indian importers have shown interest if there is price parity with other importing countries. Key varieties for India would be Valencia or Novels.
Banana and Plantains	**High** 3,380 thousand MT; although India's banana production is very high,	20 MT	NA	NA	Indian production is enough for domestic consumption and production is also increasing to meet this demand. Banana and

	consumption of banana is also very high.				plantains should be of low priority, as it will be difficult to be cost competitive in the near term.
Figs	**Low** 14.9 thousand MT; Indian fig production is very low and mostly fig is consumed in dried form in India as a dry fruit.	18.1 thousand MT (Fresh/Dried); ITC does not report fresh figs separately and as per market discussions majority of imported figs are in dried form	Indian fig imports have been growing at a CAGR of 12.3%.	Major countries for imports are Afghanistan, Iran, UAE and Turkey.	In India, fig is consumed in dried form, and fresh fruit consumption is low. Brazil can initially focus on dried fig exports to India if there is price parity for the same as compared to competing suppliers.
Pineapples	**High** 1,800 thousand MT; India is one of the leading pineapple producers globally.	Nil	NA	NA	Owing to high production, the Indian consumption is catered internally. Indian imports have also indicated low viability of imported pineapple. However, processed (canned etc.) can be an export opportunity and be explored
Avocados	**Low** India avocado production is very meagre. Mostly avocado is imported in India	418 MT	NA	Major avocado suppliers to India are Netherlands, Peru and New Zealand.	Although imports of avocado are low in India, it is consumed in urban centers and demand is picking up. Indian avocado is around one fourth the price of imported avocado. Opportunity to enter avocado in India, as some boxes of avocado can be tested in Indian market with full container load of apple/citrus.

Guavas	**High** 4,433 thousand MT; India's share in global guava production is around 40%.	656 MT	NA	India imports small quantity from Thailand and China	Import of guava is not recommended due to high perishability of the crop and high Indian production.
Grapes	**Medium** 3,213 MT; Although Indian grape production is not very high, India exports significant quantity of grapes to Europe and other markets.	6.6 thousand MT	3.6%	India's major import partners for grape are China, Afghanistan, Egypt, Chile, Peru.	There is an opportunity to import grapes during the off season and cement market share in this category. Major grape variety imported in India is black seedless.
Watermelons/ Melons	**Medium** Watermelon: 2,900 thousand MT Muskmelon: 1,312 thousand MT	Negligible	NA	NA	As these are commodities with bulk weight, watermelons are not recommended. Musk melon can be explored for imports.
Papayas	**High** 5,951 thousand MT; India's share in papaya production is around 40%.	Nil. On the contrary India exports papaya to regional markets	NA	NA	There is low opportunity for fresh papaya exports to India.
Pears	**Low** 279 thousand MT; Indian pear production is low as compared to other nations.	18 thousand MT	11%	India imports fresh pear from South Africa, USA, Spain and Argentina	Brazil has an opportunity to tap fresh pear market in India as the demand is growing. Pears from South American countries like Argentina are being imported.
Peaches	**Low** 120 thousand MT; Indian peach production is	142 MT	19%	India imports fresh peaches from Australia, China, Iran	There is an opportunity to imports from Brazil in India, as the consumption of peaches is growing.

	growing at a very slow rate.				However, the viability may be hampered due to high perishability of the fruit
Strawberries	**Low** 20 thousand MT; Indian strawberries production is increasing at a CAGR of 10% since last 9 years.	1 MT (16 MT in 2019)	-46%	India imports strawberries from Iran and Argentina.	India's demand is largely fulfilled through domestic production. Fresh strawberries offer opportunity mainly through air cargo. However, financial feasibility of the same from Brazil should be analysed. Frozen/processed strawberries can offer higher potential for India.
Airelas Blueberries etc	Limited data available	USD 395 thousand	207% from 2016-20	Indian imported Fresh cranberries, blueberries and other fruits mainly from Chile, Canada and Netherlands	Opportunity for import through air cargo and consumption is increasing in urban centres. Indian production is minimal. There is potential to import frozen berries etc. in India.
Persimmons (Diospiros) etc.		USD 130 thousand	Persimmons import is growing at an annual rate of 16%.	Persimmons are mainly imported from Spain	Persimons/Carombolas are gaining increasing importance in India. Brazil exporters can focus on few boxes in their regular fruit cargo.
Carambolas (Averrhoa Carambola), Annonas, Lychee etc.	Lychee-**High** 728 thousand MT; In India, in this segment lychee is a major commodity. Other commodity data is not reported.	11.2 thousand MT under HS code 081090 which includes		India imported mainly from Netherlands, Belgium, Turkey and Canada.	

5.1.1. Mapping of Key Fruit Importers

Key Fruit Importers	Brief Profile
Suri Agro Fresh Pvt Ltd	Suri Agro Fresh Pvt. Ltd. is one of the largest distributors and importers of fresh produce in India, handling over 65,000 MT of fruits and vegetables every year. The company is a JV between Suri family and Total Produce PLC, Ireland.
I. G. International	IG International is one of the top fresh fruits importers in India based in Mumbai and distribution in 27 cities across India. Company has 16 cold storages, 85 refrigerator trucks and more than 50 varieties of products.
Yuppa Fresh Pvt Ltd.	Mumbai based company, Yupaa International, started in 1998, was dealing in import, distribution and marketing of fresh fruits from all over the world. Since July 2016, Yupaa International and Yupaa Valley have merged and are completely a part of Yupaa Fresh Pvt. Ltd. which is a Joint Venture with Capespan Group.
NGK Trading Company	NGK Trading is one of leading fruit importer based in Delhi.
BigBasket	bigbasket.com (Innovative Retail Concepts Private Limited) is India's largest online food and grocery store. Company has been recently acquired by TATA group, and bigbasket sometimes imports fruits directly.
MKC Traders	MKC Traders is one of leading fruit traders from North India which is integrated with fruits farmers. The company from last two years has entered into imported fruit also.
Waycool	WayCool Foods & Products Pvt. Ltd. is one of India's fastest growing Agri-Tech companies, driving social impact while transforming India's food economy. Founded in July 2015, WayCool aims to build the world's largest food development and distribution services company and positively impact the lives of 500,000 farmers.

5.2. Key Recommendation for Increasing Brazilian Fruits Exports

Based on the interactions during the primary survey, mainly with the importers and modern trade players, and growth trends witnessed from the secondary research the following key recommendations are being suggested which can be implemented during the short and long term:

1. **Cementing market share in 2-3 commodities:** Compared to imports from other South American players like Argentina, Peru and Chile, the fruit imports from Brazil into India are low. Brazil can easily tap the growing fruit market in India. The focus initially could be on major products like apple and citrus, to develop trade networks and relationship.

   Once a regular supply chain is developed and Brazil is able to establish a decent trade volume to India, the full container load of major commodities like apple/citrus can be utilised for trials of minor fruits. In the same container some boxes of other fruits can be exported to understand the market and demand for such commodities. The commodities which show positive results can be focused for deeper penetration.

2. **Value added processed products:** Products like strawberries, blueberries etc. need to be imported by air cargo. In such cases, a detailed proper feasibility analysis is required to map the market demand and price parity. Brazil can focus on exporting processed berries in frozen form.
   In India, fig is majorly consumed in dry form and imported from key producers like Iran, Afghanistan. Brazil can focus on dried figs after looking at the competitiveness of the product as compared to these regional markets.

3. **Strategic Tie-Ups:** Modern retail in India has reached a market share of around 25% in key urban markets and around 10% for overall India (as per Nielsen report). As per inputs from the market survey, fruit consumption in India is growing at a rate of 15-20%, and for modern trade, imported fruit contributes to a total of 35-40% share in modern trade fruit requirement.

   a. Brazil exporters can plan to have strategic tie-ups (JV, Equity Alliance, long term supply contracts, exclusive import rights etc.) with one or two large importers in India, who can be partner in growing the portfolio of products to be sold in India. The local player can also handle the supply chain in the domestic market and can be a regular source of feedback. Over the years, more of such partnerships can be developed in India.

4. **Marketing Initiatives:** For the short term, some of the importers have shown interest to have tie-ups with Brazil. This activity can be implemented at formal level, and a buyer-seller meeting can be planned with a wider audience. Such events can be replicated on a yearly basis.

a. Brazilian trade bodies as a country/or major exporters can have a marketing budget for India, which can be for Brazil as whole or for some key fruits. For example, major Kiwi Brand-Zespri from New Zealand has captured mind share in India as the company in partnership with the Indian players, company invests a lot in marketing and plans two national level marketing campaigns for Zespri in India. Brands from Brazil which command a premium in global markets, can take this initiative in India which will also enable brand recall for other fruits/players.

b. Brazil can also plan to have marketing campaigns in partnership in Modern Trade, viz. Korean Embassy did a joint marketing partnership with Spencer's India and the response was encouraging. Modern Trade has wide reach across India, and customers are willing to try new products. Online retail which now forms around 1-2% of modern trade is also growing at a very rapid rate and can be targeted for partnerships for promoting fruit brands in partnership.

c. Exporters from Brazil can participate in trade fairs in India and in some international fruit events and target Indian importers. Embassy can plan to set up a trade facilitation desk for some initial years to connect with Indian importers. This trade facilitation desk can be manned by front desk which can interact in English with Indian players.

ANNEXURES 1

Food Additive	INS No.	Recommended Maximum Level
Beeswax	901	GMP
Candelilla wax	902	GMP
Carnauba wax	903	GMP
Glycerol ester of wood rosin	445(iii)	110 mg/kg
IRON OXIDE		1,000 mg/kg
Microcrystalline wax	905 c (i)	50 mg/kg
Ortho-Phenylphenol	231	12 mg/kg
Sodium orthophenylphenol	232	
Polyethylene glycol	1521	GMP
Polyvinylpyrrolidone	1201	GMP
SULFITES		30 mg/kg
Shellac, bleach	904	GMP
Sucroglycerides	474	GMP

Source: The Food Safety and Standards (Food Products Standards and Food Additives) Regulations, 2011

Maximum Residue Tolerance Limit mg/kg ppm			
Name of Insecticides	**Grapes**	**Citrus**	**Apple**
Diuron	1	1	-
Iprodione	10	-	-
Tridemorph	0.5	-	-
Penconazole	0.4	-	0.1
Myclobutanil	1	-	0.01
Cymoxanil	0.1	0.05	-
Triadimefon	2	-	-
Fosetyl-A1	10	-	-
Dimethomorph	2	-	
Propineb	0.5	-	1
Formothion	-	0.2	-
Monocrotophos	-	0.2	-
Phosalone	-	1	-
Dodine	-	-	5
Thiophenatemethyl	3	-	5
Fenarimol	-	-	5
Hexaconazole	0.1	-	0.1
Dithianon	-	-	0.1
Difenoconazole	3	-	0.01
Carbaryle		15	
Imidacloprid	1	1	
Thiamethoxam		0.5	
Phosalone		1	5
Monocrotophos		0.2	
Lead		0.1	0.1
Quinalphos		0.05	
Diafenthiuron		0.2	
Mancozeb	5	0.05	
Spiromesifen			0.01

Tebuconazole	6		1
Thiacloprid			0.7
Trifloxystrobin	3		0.7
Fluxapyroxad	3		0.9
Bifenthrin			0.5
Bitertanol			0.4
Chlormequat Chloride (CCC	0.05		
Cyantranilipole	0.01		
Metiram as CS2	5		
Famoxadone	2		
Fenamidone	0.6		
Fipronil	0.01		
Flusilazole	0.05		0.05
Forchlorfenuron	0.01		
Fosetyl-Al	10		
Hydrogen Cyanamide	0.01		
Lambda cyhalothrin	0.05		
Mandipropamid	2		
Metalaxyl-M	1		
Methomyl	0.3		
Picoxystrobin	0.05		
Pyraclostrobin	2		0.5
Fluopicolide	2		
Fluopyram and its metabolites	2		
Boscalid	5		
Metrafenone	5		
Abamectin	0.05		
Alpha naphthyl Acetic Acid	0.05		
Ametroctradin	6		
Azoxystrobin	2		
Buprofezin	1		
Captan	25		
Carbendazim	3		
Fenazaquin			0.2
Hexythiazox			0.3
Prohexadione calcium			0.01
Propargite			3

Source: Food Safety and Standards (Contaminants, Toxins and Residues) Regulations, 2011

Mango	Maximum Residue Limit (MRL)
Alpha naphthyl Acetic Acid	0.05
Azoxystrobin	0.7
Sum of benomyl and carbendazim expressed as carbendazim	2
Buprofezin	0.1
Carbendazim	5

Deltamethrin (Decamethrin)	0.01
Dinocap	0.1
Mancozeb	2
Ethephon	2
Hexaconazole	0.02
Imidacloprid	0.2
Lambda cyhalothrin	0.2
Paclobutrazol	0.01
Penconazole	0.05
Tebuconazole	0.2
Thiamethoxam	0.2
Triadimefon	0.03
Trifloxystrobin	0.4
Tridemorph	0.05

Source: Food Safety and Standards (Contaminants, Toxins and Residues) Regulations, 2011

Banana	**Maximum Residue Limit (MRL)**
Carbendazim	1
Sum of benomyl and carbendazim expressed as carbendazim	1
Tebuconazole	1.5
Metiram as CS2	2
Diuron	0.1
Pyraclostrobin	0.02
Trifloxystrobin	0.1

Source: Food Safety and Standards (Contaminants, Toxins and Residues) Regulations, 2011

Other fruits - Maximum Residue Tolerance Limit mg/kg ppm		
Lead	Berries and Other Small Fruits	0.2
	Assorted Subtropical Fruits, Edible or Inedible Peel	0.1
	Citrus Fruits	0.1
	Pome Fruits	0.1
	Stone Fruits	0.1
2,4-Dichlorophenoxy Acetic Acid	All Fruits	2
Sum of Benomyl And Carbendazim Expressed as Carbendazim	Other Fruits	5
Carbendazim	Other Fruits	5
Carbofuran (Sum of Carbofuran and 3-Hydroxy Carbofuran Expressed as Carbofuran)		0.1
Ethylene Bis- Dithiocarbamates	Other Fruits	3
Dicofol	Other Fruits	5
Phosalone	Fruits	2

Phorate (Sum of Phorate, Its Oxygen Analogue and Their Sulphoxides and Sulphones, Expressed as Phorate)	Fruits	0.05
Dimethoate	Fruits	2
Malathion	Fruits	4
Monocrotophos	Other Fruits	1
Chlorpyriphos	Stawberry-0.03, Plum-0.5, Pomefruit-1.0 And Other Fruits 0.5	
Captan	Cherries-25, Grapes-25 And Melons-10, Other Fruits & Other Vegetables 15	
Paraquat Dichloride		0.05
Thiometon	Fruits	0.5
Trichlorfon	Fruits	0.1

Grapes Insecticides	Mexico	Peru	Spain	Egypt	USA	S Africa	NZ	Australia	Canada	Chile	China	France	Iran	Italy
Aspidiotus nerii (aucuba scale)														
Bactrocera tryoni (Queensland fruit fly)														
Ceratitis 97apitate (Mediterranean fruit fly)														
Epiphyas postvittana (light brown apple moth)														
Frankliniella occidentalis (Western flower thrips)														
Pseudococcus calceolariae (scarlet mealy bug)														
Spodoptera frugiperda (fall armyworm)														
Peridroma saucia (pearly underwing moth)														
Selenaspidus 97apitate9797o (West Indian red scale)														
Lobesia botrana (grapve berry moth)														
Phytonemus pallidus (strawberry mite)														
Arabic mosaic virus (hop barebine)														
Calepitrimerus vitis (grape leaf rust mite)														
Panonychus citri (citrus red mite)														
Pseudococcus longispinus (long-tailed mealybug)														
Scirtothrips 97apitate (South African citrus thrips)														
Ceratitis rosa (Natal fruitfly)														
Anastrepha fraterculus (South American fruit fly)														
Harmonia axyridis (harlequin lady bird)														
Amyelois transitella (naval orange worm)														
Phytophthora cryptogea (tomato foot rot)														
Grapevine fan leaf virus (grapevine courtnoue virus)														
Peach rosette mosaic virus (rosette mosaic of peach)														
Tomato ringspot virus (ringspot of tomato)														
Ametastegia														
Limothrips cerealium (corn thrips)														
Phaeoacremonium aleophilum (Petri disease)														
Phaeomoniella 97apitate9797ore (Petri disease)														
Helix aspersa (common snail)														
Nectria radicicola (black rot)														
Eryophyes vitis (grape mite)														
Caliothrips faciatus (thrips)														
Drepanothrips reutri (grape thrips)														
Drosophila simulans														
Homalodisca 97apitate97 (glassy winged sharpshooter)														

Hyphantria cunea (mulberry moth)														
Melittia cucurbitae (squash vine borer)														
Metcalfa 98apitate (frosted moth-bug)														
Plasmophora viticola (grapevine downy mildew)														
Planococcous ficus (vine mealy bug)														
Grapevine leafroll-associated viruses (leafroll disease)														
Grapevine fanleaf virus (grapevine court-noué virus)														
Xylella fastidiosa (Pierce's disease of grapevines)														
Tetranychus pacificus (Pacific spider mite)														

Apple Insects	Romania	Afghanistan	Turkey
a) Adoxophyes orana (Summer fruit tortrix)			
(b) Ametastegia			
c) Archips podana (Great brown twist moth)			
(d) Epidiaspis leperii (European pear scale)			
€ Frankliniella occidentalis (Western flowerthrips)			
f) Grapholita funebrana (Red plum maggot)			
(g) Grapholita molesta (Oriental fruit moth)			
(h) Hedya nubiferana (Bud moth)			
i) Hoplocampa			
(j) Leucoptera malifoliella (Pear leaf blister moth)			
(k) Orthosia cerasi (common quaker)			
(l) Ostrinia nubilalis (European maize borer)			
(m) Pandemis heparana (apple brown tortrix)			
(n) Peridroma saucia (pearly underwing moth)			
(o) Venturia pyrina (black spot of pear)			
(p) Erwinia amylovora (fireblight)			
(q) Apple stem pitting virus (Apple Spy 227 epinasty & decline)			
(a) Byturus tomentosus (Raspberry beetle)			
Venturia pyrina (Black spot of pear)			
Ceratitis 99apitate (Mediterranean fruit fly)			
Grapholita molesta (Oriental fruit fly)			
) Lymantria monacha (nun moth)			
Tomato ring spot virus (ringspot of tomato)			

Citrus	Egypt	S Africa	Australia
a) Ceratitis 100apitate (Mediterranean fruit fly)			
(b) Brevipalpus lewisi (citrus flat mite)			
€ Spiroplasma citri (stubborn disease of citrus)			
(a) Aspidiotus nerii (aucuba scale)			
€ Ceratitis rosa (Natal fruitfly)			
(d) Cryptophlebia leucotreta (false codling moth)			
€ Guignardia citricarpa (citrus black spot)			
(f) Pseudococcus calceolariae (scarlet mealybug)			
Bactrocera aquilonis			
€ Bactrocera jarvisi			
Bactrocera neohumeralis			
€ Bactrocera tryoni (Queensland fruit fly)			
Epiphyas postvittana (light brown apple moth)			
Unaspis citri (citrus snow scale)			

As per the World Bank's Ease of Doing Business Report on Trading Across Borders, India (ex. Mumbai) takes 60 hours and 273 USD to import on account of border compliance. Because of documentary compliance, it takes 22 hours and 100 USD to import into India. The exhibit below highlights India's score, ranking and key indicators on Border Trade.

Exhibit 116: India's Raking in Import Parameters

Indicator	Mumbai	South Asia	OECD high income	Best Regulatory Performance
Time to export: Border compliance (hours)	50	53.4	12.7	1 (19 Economies)
Cost to export: Border compliance (USD)	231	310.6	136.8	0 (19 Economies)
Time to export: Documentary compliance (hours)	18	73.7	2.3	1 (26 Economies)
Cost to export: Documentary compliance (USD)	50	157.9	33.4	0 (20 Economies)
Time to import: Border compliance (hours)	60	85.7	8.5	1 (25 Economies)
Cost to import: Border compliance (USD)	273	472.9	98.1	0 (28 Economies)
Time to import: Documentary compliance (hours)	22	93.7	3.4	1 (30 Economies)
Cost to import: Documentary compliance (USD)	100	261.7	23.5	0 (30 Economies)

Source: World Bank Ease of Doing Business (circles represent scores against each indicator)

Abbreviations

APEDA	The Agricultural and Processed Food Products Export Development Authority
CAGR	Compound Annual Growth Rate
DGFT	Directorate General of Foreign Trade, Ministry of Commerce and Industry
FAO	Food and Agriculture Organization, United Nations
FIG	Farmer Interest Groups
FPO	Farmer Producer Organizations
FSSAI	Food Safety and Standards Authority of India
FY	Financial Year of India (calendar starts from 1st April and closes on 31st March)
ITC	International Trade Centre, WTO
Kg	Kilogram
MoA	Ministry of Agriculture and Farmers Welfare
MT	Metric Tonne
NHB	National Horticulture Board, Ministry of Agriculture and Farmers Welfare, Govt. of India
NSSO	National Sample Survey Organisation, Ministry of Statistic and Program Implementation
USD	U S Dollar