

Strawberry Market Access Plan

TA-6782 IND: Enhancing Market Linkages for Farmer Producer Organizations

Draft

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1 Crop Background

Strawberry (also called garden strawberry) is a widely consumer fruit across the world, mostly cultivated in temperate regions. The fruit is known for its attractive bright red – pinking red colour, making it a visually appealing fruit. Strawberries are consumed both as fresh fruit and in processed forms such as jams, marmalades, crushes, etc. The flavor extracted from strawberry is a common ingredient for preparation of various desserts, while strawberry flavor is popular in cosmetic industry. The fruit provides a sour-sweet taste, and is rich in vitamin C, fibre, and anti-oxidants.

1.1 Global Scenario

1.1.1 Production

According to Food and Agriculture Organization (FAO), the total area under strawberry cultivation, in 2021, is nearly 4 lakh hectares producing 92 lakh MT of strawberries, spread across Americas, Europe, North Africa, and Asia. China is the top producer of strawberries producing 34 lakh MT which is 37% of the global strawberry production. Though China is the largest producer, United States of America (USA) stands out in terms of its productivity, with more than twice the global productivity and China's productivity. India is a minor producer of strawberry, would be ranked less than 50 in the list of top strawberry producing countries in 2021.

Table 1: Top 10 Countries by Strawberry Production – 2021

| S. No. | Country | Production (MT) | Area (ha) | Productivity (MT/ha) |
|--------------|--------------------------|------------------|-----------------|----------------------|
| 1 | China | 33,89,620 | 1,29,046 | 26.27 |
| 2 | United States of America | 12,11,090 | 19,992 | 60.58 |
| 3 | Turkey | 6,69,195 | 18,676 | 35.83 |
| 4 | Mexico | 5,42,891 | 11,905 | 45.60 |
| 5 | Egypt | 4,70,913 | 12,579 | 37.44 |
| 6 | Spain | 3,60,570 | 7,220 | 49.94 |
| 7 | Russia | 2,37,200 | 35,466 | 6.69 |
| 8 | Brazil | 1,97,000 | 5,084 | 38.75 |
| 9 | South Korea | 1,93,852 | 6,117 | 31.69 |
| 10 | Poland | 1,62,900 | 33,900 | 4.81 |
| World | | 91,75,384 | 3,89,665 | 23.55 |

Source: FAO Stat

The global production of strawberries has increased over the last 5 years from 82 lakh MT in 2017 to 92 lakh MT in 2021. The growth though is inconsistent and its rate is only 2% annually. The table below

indicates the world production trend through the production of top 10 countries in terms of strawberry production quantity over the last 5 years.

| Table 2: Production Trend of Top 10 Strawberry Producing Countries – 2017 to 2021 (MT) | | | | | | |
|---|--------------------------|------------------|------------------|------------------|------------------|------------------|
| S. No. | Countries | 2017 | 2018 | 2019 | 2020 | 2021 |
| 1 | China | 28,60,008 | 30,69,110 | 32,03,152 | 33,35,707 | 33,89,620 |
| 2 | United States of America | 12,34,130 | 11,83,870 | 10,35,100 | 12,09,730 | 12,11,090 |
| 3 | Mexico | 6,58,436 | 6,53,639 | 8,61,337 | 5,57,514 | 5,42,891 |
| 4 | Turkey | 4,00,167 | 4,40,968 | 4,86,705 | 5,46,525 | 6,69,195 |
| 5 | Egypt | 3,18,950 | 4,45,106 | 5,45,284 | 4,38,730 | 4,70,913 |
| 6 | Spain | 3,60,416 | 3,44,680 | 3,51,960 | 2,72,550 | 3,60,570 |
| 7 | Russia | 1,59,900 | 1,99,000 | 2,08,800 | 2,18,400 | 2,37,200 |
| 8 | South Korea | 2,08,699 | 1,83,639 | 2,34,225 | 1,63,646 | 1,93,852 |
| 9 | Brazil | 1,55,000 | 1,79,700 | 1,65,440 | 2,18,881 | 1,97,000 |
| 10 | Poland | 1,77,921 | 2,05,200 | 1,85,400 | 1,57,600 | 1,62,900 |
| World | | 82,43,751 | 85,38,477 | 90,12,639 | 88,93,591 | 91,75,384 |

Source: FAO Stat

1.1.2 Important Varieties

World over, hundreds of strawberry varieties are either commercially cultivated or grow in the wild. Many varieties are grown and consumed in small pockets / regions, while some are grown across continents due to their high suitability for commercial cultivation. The table below briefs on such varieties grown across the world.

| Table 3: Major Strawberry Varieties across the World | |
|---|---|
| Camarosa | Camarosa is common variety grown across all major strawberry producing regions. The variety has high productivity and the harvest season is between February and June. It is a short-day variety that produces large to very large, firm, deep red fruit. |
| Chandler | The variety produces fruits which have a high dessert quality, outstanding colour and flavor. The harvest window is from February till April. The shape of the berries ranges from conical to wedge. |
| Sweet Charlie | Sweet Charlie is a day-neutral cultivar that is suitable for warmer climates. The variety provides high yield and are suitable for fresh eating. |

Table 3: Major Strawberry Varieties across the World

| | |
|------------|--|
| Belrubi | The fruit of this variety is oval to wedge shaped with cherry red colour. They have good acidity that gives a mild tart-sweet taste. Their harvest season from early February to late March. |
| Fern | It is a day-neutral cultivar, June-bearing variety with a deep red colored peel. The pulp has a sweet cum mild sour taste. The variety is favorable for cultivation in cold climatic conditions since they can withstand colder climates and some frost. |
| Aroma | A popular variety in Europe and Latin America and has the ability to grow well in variety of climates. The plant has high productivity, and its fruits are known for their large size and sweet taste. It is preferred to be used for processing. |
| Seascape | Seascape is relatively new hybrid variety that has high productivity and is an ever-bearing variety. The berries are large in size with a sweet-tart flavor. |
| Beni-hoppe | It is a Japanese variety, that is mainly cultivated in China and Japan. The fruit is bright red in colour and has firm texture. The fruit is sweet with slight tanginess. |

1.1.3 Global Trade

Global trade of strawberries in 2021 was valued at USD 3.5 billion through import-export of 10 lakh MT. Spain is the largest exporter, exporting 3.16 lakh MT, followed by Mexico (1.82 lakh MT) and USA (1.37 lakh MT). The top 3 exporters alone account for 50-60% of total global exports by volume.

Table 4: Top 10 Countries by Strawberry Exports – 2021

| S. No. | Countries | Quantity (MT) | Value ('000 USD) |
|--------------|--------------------------|------------------|------------------|
| 1 | Spain | 3,16,413 | 8,45,494 |
| 2 | Mexico | 1,82,540 | 7,47,478 |
| 3 | United States of America | 1,37,495 | 5,73,861 |
| 4 | Greece | 68,427 | 1,35,600 |
| 5 | Netherlands | 65,592 | 3,64,985 |
| 6 | Turkey | 42,109 | 46,148 |
| 7 | Egypt | 40,040 | 1,10,025 |
| 8 | Belgium | 38,469 | 2,00,240 |
| 9 | Poland | 19,151 | 20,015 |
| 10 | Morocco | 18,510 | 77,769 |
| World | | 10,40,840 | 35,24,737 |

Source: FAO Stat

USA apart from being the 3rd largest exporter, was also the largest importer of strawberries in 2021 as per FAO data. European countries are the major importers of strawberries, with 8 of the top 10 importers in the world. Netherlands, being the trading hub for Europe, is both a top exporter and importer of strawberries.

| S. No. | Countries | Quantity (MT) | Value ('000 USD) |
|--------------|--------------------------|------------------|------------------|
| 1 | United States of America | 2,40,380 | 10,85,037 |
| 2 | Germany | 1,30,535 | 3,82,123 |
| 3 | Canada | 1,06,255 | 4,32,664 |
| 4 | United Kingdom | 64,732 | 2,95,012 |
| 5 | France | 64,269 | 2,03,822 |
| 6 | Russia | 64,230 | 1,02,964 |
| 7 | Italy | 38,609 | 1,08,226 |
| 8 | Netherlands | 30,330 | 1,26,650 |
| 9 | Belgium | 29,728 | 1,18,281 |
| 10 | Poland | 18,966 | 42,876 |
| World | | 10,39,444 | 38,89,633 |

Source: FAO Stat

Strawberry exports has increased from 2017 to 2021, in spite of a drop in volume in 2018 from 2017. The annual growth rate for exports was only 1.6% between 2017 and 2021. Mexico, Egypt, and Turkey have been steadily increasing their market share in global strawberry export market from 2017 to 2021. USA has been driving the increase in imports over the last 5 years, with its import share increasing from 17% in 2017 to 23% in 2021.

| S. No. | Countries | 2017 | 2018 | 2019 | 2020 | 2021 |
|--------|--------------------------|----------|----------|----------|----------|----------|
| 1 | Spain | 3,04,314 | 2,83,439 | 3,00,036 | 2,90,826 | 3,16,413 |
| 2 | Mexico | 1,26,157 | 1,24,708 | 1,37,393 | 1,49,461 | 1,82,540 |
| 3 | United States of America | 1,46,385 | 1,52,129 | 1,30,784 | 1,32,333 | 1,37,495 |
| 4 | Netherlands | 59,585 | 60,153 | 57,071 | 59,770 | 65,592 |
| 5 | Greece | 25,504 | 29,413 | 45,175 | 55,305 | 68,427 |
| 6 | Belgium | 47,935 | 45,253 | 45,069 | 42,949 | 38,469 |
| 7 | Egypt | 23,649 | 18,127 | 38,543 | 32,354 | 40,040 |
| 8 | Turkey | 13,716 | 19,858 | 25,352 | 25,298 | 42,109 |
| 9 | Morocco | 19,437 | 16,891 | 21,439 | 19,854 | 18,510 |

| Table 6: Export Trend of Top 10 Strawberry Exporting Countries – 2017 to 2021 (MT) | | | | | | |
|---|------------------|-----------------|-----------------|-----------------|-----------------|------------------|
| S. No. | Countries | 2017 | 2018 | 2019 | 2020 | 2021 |
| 10 | Belarus | 28,367 | 21,166 | 5,849 | 10,493 | 14,021 |
| World | | 9,48,135 | 8,94,205 | 9,17,629 | 9,31,544 | 10,40,840 |

Source: FAO Stat

| Table 7: Import Trend of Top 10 Strawberry Importing Countries – 2017 to 2021 (MT) | | | | | | |
|---|--------------------------|-----------------|-----------------|-----------------|-----------------|------------------|
| S. No. | Countries | 2017 | 2018 | 2019 | 2020 | 2021 |
| 1 | United States of America | 1,66,576 | 1,61,889 | 1,86,499 | 1,97,475 | 2,40,380 |
| 2 | Germany | 1,08,407 | 1,03,727 | 1,28,106 | 1,30,778 | 1,30,535 |
| 3 | Canada | 1,10,487 | 1,16,315 | 96,912 | 1,00,906 | 1,06,255 |
| 4 | France | 73,132 | 59,887 | 64,357 | 54,621 | 64,269 |
| 5 | United Kingdom | 53,226 | 48,466 | 57,379 | 58,608 | 64,732 |
| 6 | Russia | 47,672 | 49,484 | 43,885 | 43,366 | 64,230 |
| 7 | Italy | 32,350 | 35,858 | 42,314 | 36,661 | 38,609 |
| 8 | Belgium | 37,732 | 35,176 | 33,325 | 33,534 | 29,728 |
| 9 | Netherlands | 28,298 | 26,560 | 30,113 | 33,876 | 30,330 |
| 10 | Belarus | 30,986 | 21,962 | 10,023 | 13,671 | 14,385 |
| World | | 9,44,725 | 9,05,176 | 9,71,032 | 9,63,511 | 10,39,444 |

Source: FAO Stat

1.2 Indian Scenario

1.2.1 Production

India is a minor producer of strawberries due to its tropical and sub-tropical climatic conditions. The production though has been increasing from 2017-18 to 2020-21, driven by increased demand in its domestic market. Production nearly quadrupled between 2017-18 to 2020-21 due to an increase in acreage of strawberries. In 2021-22, the strawberry production is expected to drop by 40% from 2020-21, as per the 3rd estimates published by Government of India.

| Table 8: India – Strawberry Production, Area under Cultivation & Productivity – 2017-18 to 2021-22 | | | |
|---|------------------------|------------------|-----------------------------|
| Year | Production (MT) | Area (ha) | Productivity (MT/ha) |
| 2021-22 [#] | 11,290 | 2,513 | 4.49 |
| 2020-21 | 19,835 | 3,309 | 5.99 |
| 2019-20 | 8,195 | 865 | 9.47 |
| 2018-19 | 4,919 | 742 | 6.63 |
| 2017-18 | 5,311 | 653 | 8.14 |

Source: Department of Agriculture and Farmers Welfare, Government of India; # 3rd estimate

Haryana is estimated to be largest producer in 2021-22, closely followed by Maharashtra. Other strawberry producing states are Meghalaya and Mizoram. The top 4 producing states account for nearly 80-85% of country's total strawberry production.

| Table 9: Top 10 States in Strawberry Production in India – 2021-22[#] | | | | |
|---|------------------|------------------------|------------------|-----------------------------|
| S. No. | States | Production (MT) | Area (ha) | Productivity (MT/ha) |
| 1 | Haryana | 3,971 | 225 | 17.65 |
| 2 | Maharashtra | 3,246 | 1,597 | 2.03 |
| 3 | Meghalaya | 1,196 | 132 | 9.06 |
| 4 | Mizoram | 1,079 | 170 | 6.35 |
| 5 | Madhya Pradesh | 612 | 100 | 6.12 |
| 6 | Jammu & Kashmir | 391 | 52 | 7.52 |
| 7 | Tamil Nadu | 367 | 61 | 6.02 |
| 8 | Himachal Pradesh | 214 | 42 | 5.10 |
| 9 | Jharkhand | 89 | 65 | 1.37 |
| 10 | West Bengal | 76 | 10 | 7.60 |
| India | | 11,290 | 2,513 | 4.49 |

Source: Department of Agriculture and Farmers Welfare, Government of India; # 3rd estimate

The table below provides the top 10 strawberry producing states from 2017-18 to 2021-22. Since strawberry is a relatively new crop in India, with many farmers exploring the option of cultivating it, the production quantities across states over the years vary widely.

| 2021-22[#] | 2020-21 | 2019-20 | 2018-19 | 2017-18 |
|----------------------------|-----------------|------------------|------------------|----------------|
| Haryana | Chhattisgarh | Haryana | Haryana | Haryana |
| Maharashtra | Maharashtra | Jammu & Kashmir | Mizoram | Mizoram |
| Meghalaya | Haryana | Mizoram | Meghalaya | Meghalaya |
| Mizoram | Jammu & Kashmir | Meghalaya | Jammu & Kashmir | Kerala |
| Madhya Pradesh | Mizoram | Kerala | Kerala | Madhya Pradesh |
| Jammu & Kashmir | Meghalaya | Tamil Nadu | Madhya Pradesh | Tamil Nadu |
| Tamil Nadu | Madhya Pradesh | Himachal Pradesh | Himachal Pradesh | |
| Himachal Pradesh | Kerala | Chhattisgarh | Tamil Nadu | |
| Jharkhand | Tamil Nadu | Nagaland | Nagaland | |
| West Bengal | Jharkhand | | | |

Source: Department of Agriculture and Farmers Welfare, Government of India; # 3rd estimate

Though Maharashtra has been producing strawberries over many years, but the production data is being captured only from 2020-21. Maharashtra is expected to produce 3200-3300 MT of strawberry in 2021-22.

| Year | Production (MT) | Area (ha) | Productivity (MT/ha) | % of India's Production |
|----------------------|------------------------|------------------|-----------------------------|--------------------------------|
| 2021-22 [#] | 3,246 | 1,597 | 2.03 | 28.75% |
| 2020-21 | 3,280 | 1,640 | 2.00 | 16.54% |

Source: Department of Agriculture and Farmers Welfare, Government of India; # 3rd estimate

Mahabaleshwar in Satara district is the major producing region in the state, accounting for 95-99% of the state's strawberry production. Though the data published by Government of India does not indicate other production clusters in the State, Dindori taluka in Nashik district is also witnessing an increase in strawberry cultivation. Favorable climatic conditions have encouraged farmers to adopt strawberry cultivation in that region.

| Table 12: District-wise Strawberry Production in Maharashtra – 2021-22[#] | | | | |
|---|---------------|------------------------|------------------|-----------------------------|
| S. No. | States | Production (MT) | Area (ha) | Productivity (MT/ha) |
| 1 | Satara | 3,245 | 1,596 | 2.03 |
| 2 | Amravati | 1 | 1 | 1.00 |
| Maharashtra | | 3,246 | 1,597 | 2.03 |

Source: Department of Agriculture, Government of Maharashtra; # 3rd estimate

1.2.2 Trade – International

Strawberry exports from India is insignificant since the production quantity is low compared to the domestic demand. It is considered a premium / exotic fruit in India, and hence it fetches good prices in domestic market. This leads to low surplus available for exports. India has exported just above 100 MT of strawberry over 5 years from 2017-18 to 2021-22.

| Table 13: Strawberry Exports from India – 2017-18 to 2021-22 | | |
|---|----------------------|----------------------|
| Year | Quantity (MT) | Value (₹ Crs) |
| 2021-22 | 5 | 0.08 |
| 2020-21 | 48 | 0.52 |
| 2019-20 | 11 | 0.07 |
| 2018-19 | 11 | 0.05 |
| 2017-18 | 32 | 0.13 |

Source: Agri Exchange – APEDA

The largest importer of strawberry from India was Australia in 2021-22, importing just 2.40 MT. In 2021-22 India exported strawberries in small quantities to 10 countries.

| Table 14: Strawberry Export Quantity and Value for Top 5 Destinations from India – 2021-22 | | | |
|---|----------------|----------------------|----------------------|
| S. No. | Country | Quantity (MT) | Value (₹ Crs) |
| 1 | Australia | 2.40 | .03 |
| 2 | Nepal | 1.61 | .01 |
| 3 | New Zealand | .50 | .01 |
| 4 | Maldives | .37 | .01 |
| 5 | Bhutan | .12 | .00 |
| India | | 5 | 0.08 |

Source: Agri Exchange – APEDA

The top countries that India exports strawberries to keep varying year-on-year due to low quantum of exports. The year-on-year export quantity for the top 5 importers of Indian strawberries (aggregate imports from 2017-18 to 2021-22) is provided in the table below.

| Table 15: Export Trend of Top 5 Strawberry Importing Countries from India – 2017-18 to 2021-22 | | | | | | |
|---|----------------------|----------------|----------------|----------------|----------------|----------------|
| (MT) | | | | | | |
| S. No | Country | 2017-18 | 2018-19 | 2019-20 | 2020-21 | 2021-22 |
| 1 | Saudi Arabia | 1.63 | .00 | .00 | 42.00 | .00 |
| 2 | Nepal | 29.68 | 2.39 | 3.54 | 5.18 | 1.61 |
| 3 | Bhutan | .00 | 8.18 | .00 | .00 | .12 |
| 4 | United Arab Emirates | .03 | .01 | 4.65 | .00 | .02 |
| 5 | Australia | .00 | .00 | .00 | .00 | 2.40 |
| India | | 31.76 | 10.79 | 10.61 | 48.03 | 5.26 |

Source: Agri Exchange – APEDA

India also imports small quantities of strawberries, majorly from Sri Lanka. In 2021-22, India imported 25 MT and 30 MT from April to November 2022 from Sri Lanka.

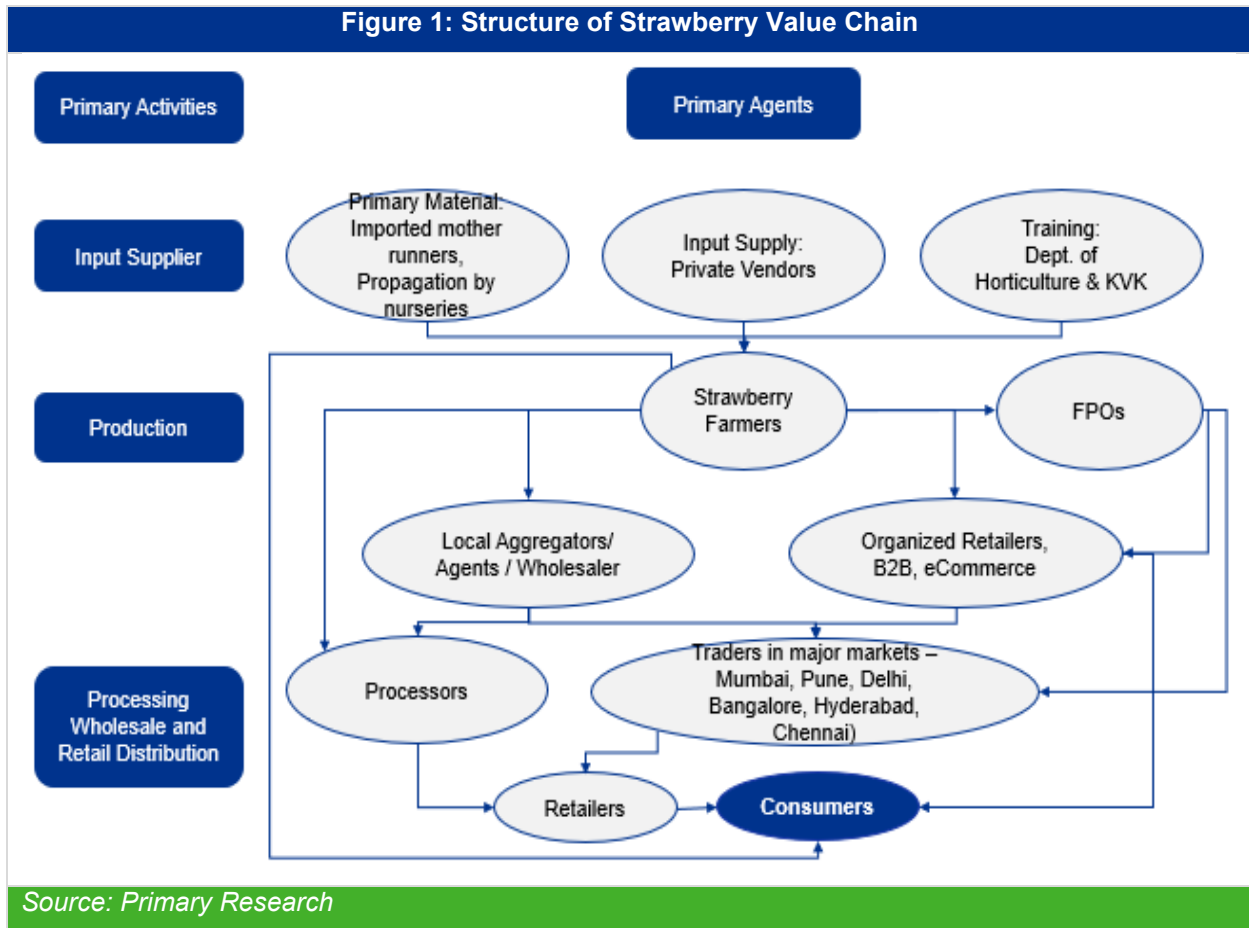
1.2.3 Trade – Domestic

Data on domestic trade of strawberries – arrivals and prices in Government regulated *Mandis* – is not available on the AGMARKNET portal of Government of India. Details on the domestic market is discussed under *Section 2.2* of this document.

1.2.4 Value Chain Overview

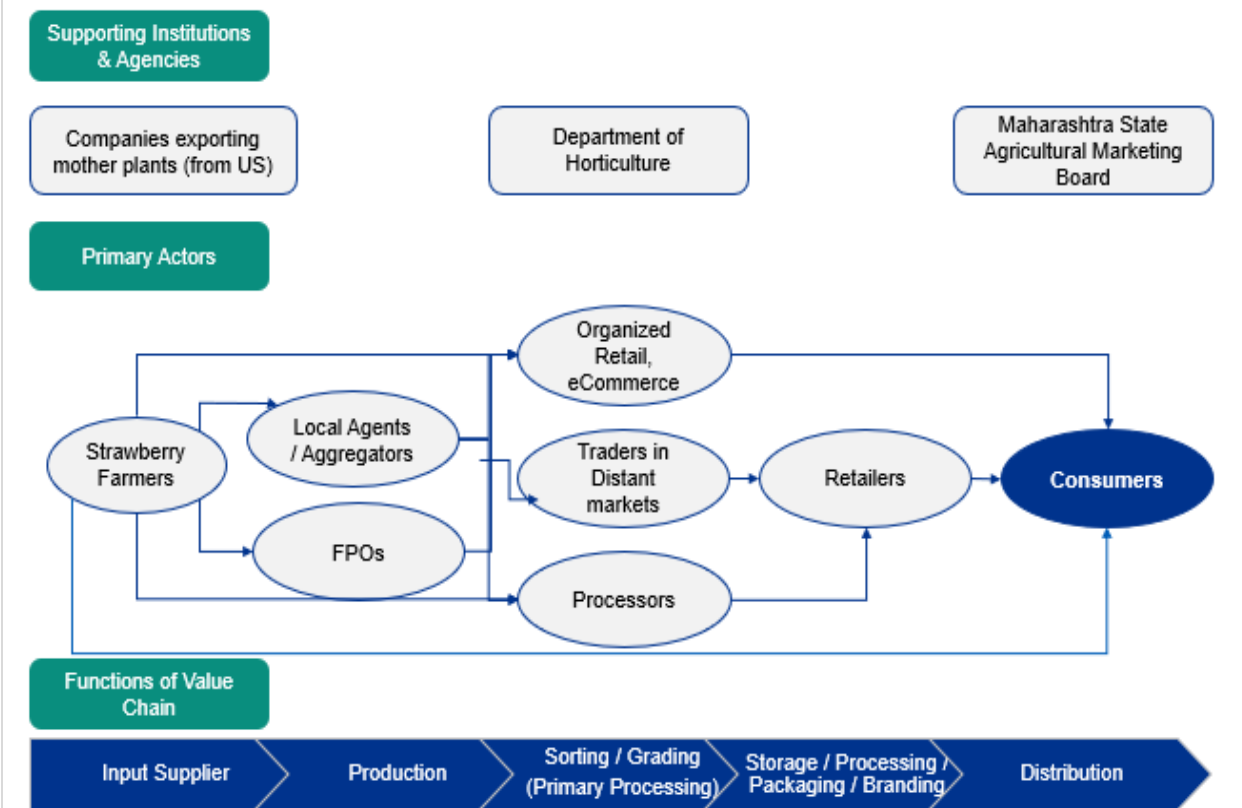
The strawberry value chain starts from importing mother plants from US (and / or other countries), which is in turn planted by farmers in Maharashtra. Strawberry farmers sell their produce through multiple channels such as village-level aggregators to organized retailers. Direct consumer sales from farm / highway is also done by farmers. The structure of strawberry value chain is provided in the figure below.

Figure 1: Structure of Strawberry Value Chain



There are 5 marketing channels from farmer to consumer – FPO, local aggregators, processors, organized trade, and direct consumer selling. The commodity flow through these marketing channels is detailed in the figure below.

Figure 2: Commodity Flow and Trade Analysis of Strawberry



Source: Primary Research

2 Marketing Strategy

Individual farmers and FPOs face issues in accessing profitable markets for their produce. Key challenges for them are their remote locations, high transportation costs, limited market information / knowledge of requirements, and the lack of marketing skills. The following market strategy has been prepared with a focus on providing information that helps FPOs in accessing reliable and profitable markets, while ensuring their produce meets market standards. In addition, it is envisaged that the FPOs have better bargaining power, some of the value chain activities are shifted towards them and there is a win-win situation for both FPOs and associated value chain actors / market players. Also, while providing information on opportunities, associated risks have also been highlighted. Prior to a detailed market segment-wise strategy, some of the common and cross-cutting interventions that are required at the end of FPOs for better market access are given below:

Commodity resource mapping and Know Your Farmers (KYF): FPOs should keep information on acreage of cultivable land under different crops, approximate marketable crop available with the farmers in the season, etc. This will help FPOs to have an idea of the volumes to be handled in the season and plan to effectively market their produce eventually.

Aggregate large volumes of produce: FPOs can establish long-term business relationship only if they are able to consistently supply sufficient quantity of produce, as per the buyer requirements. FPOs can increase procurement catchment area to consistently meet minimum requirement quantities.

Flexibility with payment terms: Many market segment function on credit cycle, which can vary from as low as 5-7 days to as high as 30-60 days. FPOs should have sufficient working capital to made credit cycle and farmer payments.

Have good market intelligence: FPOs should have good market intelligence to decide on store / sell decisions and to determine which market to send the produce to. Market intelligence can be collected through online sources such as Government data and news articles, and through on-ground network of contacts in different parts of the country. Keeping a tab on market situations in target export markets will help FPOs in market entry and expansion.

Appointment of manager: FPOs can appoint a manager for its market linkage business. This will help in better sales planning, coordination with buyers for purchase and payment timelines. It can also appoint a manager for procurement activities. For FPOs to expand its business and supply to more buyers, it is necessary to have strong procurement, and appointment of manager can help in establishing the same.

Diversify supply options: All types of markets and customers come with both opportunity and risks for FPOs. This document also details on potential risks that FPOs might face in each market. To mitigate risks, FPOs should ensure that it deals in multiple markets and with multiple customers in each market. In addition, to get quality commensurate pricing, FPOs need to supply each market with its required quality of produce.

This section details out the strategy that the FPOs can adopt to supply strawberries in the major market segments, namely, 1) Export Markets, 2) Domestic Markets, 3) Organized retail and eCommerce, and 4) Processors. Key components of this section are:



2.1 Exports

Regions / countries covered under export markets are those to which strawberry is either exported or can be exported from India. Export markets are classified as Current Export Markets and Potential Export Markets.

2.1.1 Current Export Markets

India exports is a minor producer of strawberries with strong domestic demand. This results in less surplus for market players to export strawberries to other countries. As provided in *Section 1.2.2*, India's exports was less than 10 MT in the year 2021-22. Year-on-year, the countries that India exports strawberries to keeps changing indicating that there is no steady market for Indian strawberries. This also indicates that exports were done either on ad-hoc basis such as individual exporters sending small quantities along with other products and on trial basis.

Over the last 5-years, India has exported small quantities of strawberries to the following markets – Indian Sub-continent (Nepal, Bhutan, Maldives, Sri Lanka), the Middle East (Saudi Arabia, UAE, Qatar, Oman), Oceania (Australia, New Zealand), Singapore and Canada.

In the markets that India is currently exporting strawberries to, except for the Indian Sub-continent market, India is not among the top 10 suppliers to those markets. Egypt and Jordan, countries in the Middle East, produce and export strawberries to other countries in the region. The Middle East also imports strawberries from USA. Canada's top suppliers are USA and Mexico, while Singapore majorly imports from South Korea,

USA, and Australia. The Indian Sub-continent markets' import of strawberries is significantly less when compared to other markets, and the major suppliers are Egypt, Australia, Netherlands, and UAE (re-exports). Other market where India has exported in small quantities are Australia and New Zealand. Australia is both a large producer and exporter of strawberries.

Maharashtra is the largest exporter of strawberries from India over the last five years. FPOs looking to export strawberries do not have significant competition from other Indian states. The reason being the high domestic demand that makes the domestic markets lucrative for strawberry market players to focus on.

2.1.2 Potential Export Markets

To grow exports of strawberries, it is important that India increases production significantly and target the right export markets. Production should be increased to create surplus for exports after meeting domestic demand. Lucrative export markets for Indian horticulture produce such as the Middle East and Europe either have strong supply within their region or countries' themselves produce / export strawberry.

To find the right export markets, it is necessary to select regions that have low production (tropical regions). This makes Indian Sub-continent and Southeast Asian markets suitable for exporting strawberry from India. Both these regions have low production and do not have proximity to major production regions (except for proximity to China).

2.1.2.1 Indian Sub-Continent

Indian Sub-continent market includes the following countries – Bangladesh, Pakistan, Nepal, Bhutan, Sri Lanka, and Maldives. The Indian Sub-continent market consists of countries that are in the lower-middle income to middle income category. Strawberry is considered to be an exotic fruit in this market and sold at premium price leading to limited consumption. The customers are more price sensitive and less stringent in terms of quality.

Maharashtra FPOs would face competition from suppliers from West Bengal, Assam, Meghalaya, and Mizoram (all minor producers) for exports to Bangladesh and Bhutan. These states have the advantage of geographical proximity leading to lower logistics cost. Along with these States, Haryana, the largest producer in India, is also a competitor for exports to Nepal. Tamil Nadu, a minor producer, has the geographical advantage of supplying to Sri Lanka. The current exports to Sri Lanka, though, are done from Maharashtra. Among the competing States, Maharashtra has the advantage of producing high quality strawberries, due to favorable climatic conditions and adoption of good practices by growers.

Supplying strawberries to these markets can be done either by road or sea. Bangladesh, Nepal, and Bhutan markets can be supplied by road, while Sri Lanka can be supplied by sea. These countries, except for

Bhutan, do not have strict compliances on pests and residue levels. Due to high price sensitivity of consumers in these countries, pricing is the major driving factor for demand.

FPOs looking to supply to this market can supply medium-to-high grade strawberries. It is essential for FPOs to establish cold chain facility, such as a cold room for sorting and grading operations and pre-cooling chamber. Transit should be done in reefer containers to ensure the freshness and good retail shelf life of the fruits.

2.1.2.2 Southeast Asia

Vietnam, Thailand, Singapore, Malaysia, Indonesia, Cambodia, Laos, and Philippines are the major countries part of the Southeast Asia region. Many countries in this the Southeast Asian region are middle-high income countries with purchasing power higher than India and other Indian Sub-continent countries. The top importers of strawberry in this region are Singapore, Thailand, Malaysia, and Vietnam.

These markets have higher demand / consumption of strawberries than Indian Sub-continent, but lower in comparison to developed markets such as Europe and North America. Since the climatic conditions in this region (tropical and sub-tropical) is not highly suitable for strawberry cultivation, their domestic production is limited and their demand is met through imports. The major exporters to the Southeast Asian market are South Korea, Australia, Egypt, and USA.

South Korea and Australia account for 25-30% each of the total imports to Southeast Asia, while Egypt and USA account for 15-20% each. South Korea and Australia have the advantage of geographical proximity to the Southeast Asian market in comparison to top exporters world-wide such as Spain, Mexico, and USA. Both South Korea and Australia are not only top exporters of strawberries but have taken advantage of their geographical proximity to the Southeast Asian market and have taken a large market share in these markets.

FPOs looking to supply to these markets would face competition from the 4 countries mentioned in the above paragraph. To compete with these countries, it is necessary that the FPOs can consistently supply quality strawberries (Grade I) throughout the season. This would require high production and procurement capacities, along with cost-effective supply chain. India has the advantage of geographical proximity (lower logistics cost) to some countries such as Thailand, Malaysia, Singapore, and Indonesia when compared to South Korea. FPOs should also invest in cold chain infrastructure such as cold room for sorting and grading, pre-cooling chamber, and reefer trucks. Supply can be done either through air or by sea from eastern coastline ports such as Chennai port.

The average import price of major importing countries in Southeast Asia (Singapore, Thailand, Malaysia, and Vietnam) is in the range of USD 5-17 per kg. The average import prices from Australia are in the range

of USD 6-8 per kg, from Egypt are USD 2.50-4.50 per kg, from South Korea are USD 6-17 per kg, and from USA are USD 2-9 per kg. Indian FPOs should be able to deliver at a similar landing cost to these markets to be competitive.

2.1.3 Establishing Connects

To export produce it is necessary to understand the major export routes and to establish connects with relevant companies / personnel. The selection of export route for an FPO should be done as per the quality of produce available for export, human capital to handle export related compliances, financial capabilities, and risk-taking ability.

Exports can be done through two routes:

| Export Route | Description |
|--|---|
| Through an exporter from India | Companies / individuals specialize in exporting of agriculture and horticulture commodities to specific export markets. FPOs can supply produce as per required quality specifications to the exporters. The exporters buys the products from FPOs and then exports the products. |
| Through an importer at the importing country | FPOs can identify importers in the importing country. Importers are companies / individuals that obtained the necessary permissions in the importing country to import specific agriculture and horticulture commodities |

| Export Route | Establishing Connects |
|--------------------------------|---|
| Through an exporter from India | <ul style="list-style-type: none"> ● Trade fairs (physical and virtual) conduct by APEDA. Details are published on https://apeda.gov.in/apedawebsite/trade_promotion/International_trade_event ● Other National Trade Fairs conducted by various Organizations / Association. These events are published on various platforms such as: <ul style="list-style-type: none"> ○ https://krishijagran.com/events ○ https://www.kisaanhelpline.com/agriculture-events ○ https://www.2exhibitions.com/agriculture-and-forestry/ ● Online trade websites such as www.indiamart.com and www.exportersindia.com ● Buyer-Seller meets organized under the MAGNET project |

| Export Route | Establishing Connects |
|--|--|
| Through an importer at the importing country | <ul style="list-style-type: none"> ● Trade fairs (physical and virtual) conduct by APEDA. Details are published on https://apeda.gov.in/apedawebsite/trade_promotion/International_trade_event ● Other National Trade Fairs conducted by various Organizations / Association. These events are published on various platforms such as: <ul style="list-style-type: none"> ○ https://krishijagran.com/events ○ https://www.kisaanhelpline.com/agriculture-events ○ https://www.2exhibitions.com/agriculture-and-forestry/ ● International Trade Fairs such as: <ul style="list-style-type: none"> ○ Fruit Logistica: yearly event at Berlin, Germany is one of the most important events for fruit trade across the world ○ Asia Fruit Logistica: yearly event conducted in Asia – at Hong Kong / Bangkok ○ Fruit Attraction: yearly event at Madrid, Spain ● International events on horticulture trade are regularly published on the website of CBI – a centre for promotion of imports from developing countries to Europe. www.cbi.eu/events ● www.freshplaza.com, and https://www.hcisingapore.gov.in/events also provides an event calendar on important global fairs for horticulture crops |

2.1.4 Advantages and Risks Associates

Each export route mentioned in the above sub-section comes with its risks. Not each export route is suitable for all FPOs, and it is necessary for FPOs to understand the risks before pursuing exports through any of these routes.

| Export Route | Risks / Disadvantages | Advantages |
|--------------------------------|---|--|
| Through an exporter from India | <ul style="list-style-type: none"> ● Significant margin from the final export price is taken by the exporter ● FPOs cannot make significant export-oriented investments as export orders may not be assured. Exporters can procure equivalent quality from any other seller at lower prices, if available | <ul style="list-style-type: none"> ● Exporting through this route is suitable for all FPOs, especially for FPOs that handle small quantities ● Payment terms from exporters to FPOs can be for shorter credit time |

| Export Route | Risks / Disadvantages | Advantages |
|--|--|--|
| | <ul style="list-style-type: none"> ● Countries can ban import of strawberry from India due to reasons such as repeated non-compliance to MRLs or pest infestations. These are outside the control of the FPO, and can significantly affect FPO's business in case it has high exposure to that export market | <ul style="list-style-type: none"> ● Export compliance is handled by the exporter – only quality adherence is taken care by FPOs |
| Through an importer at the importing country | <ul style="list-style-type: none"> ● FPO should be able to send the minimum required quantity per consignment consistently. This is possible only through strong procurement (from its member farmers, and other growing regions) ● Payment default by importers in case the FPO does not take precautionary measures like Letter of Credit ● Credit timelines for payment from the importer can be as high 30 to 60 days ● FPO requires proper and complete knowledge on export compliance requirements of the importing country ● Rejection of consignment by importing country – shortfall in compliances ● Countries can ban import of strawberry from India due to reasons such as repeated non-compliance to MRLs or pest infestations. These are outside the control of the FPO, and can significantly affect FPO's business in case it has high exposure to that export market | <ul style="list-style-type: none"> ● Higher margins ● Long-term business opportunity. FPO can become an exporter for other FPOs / market players ● Increased exports through volume and by adding other crops in which the FPO is dealing |

2.2 Domestic Markets

Domestic markets here are the Government notified *Mandis* and private traders in large cities across the country.

2.2.1 Characteristics of the Segment

Domestic markets consume all grades of strawberries, as it has a wide range of customer segment from exporters to retailers to processors. The demand from domestic market is constant throughout the year, while the pricing is based on day-to-day supply demand dynamics.

Access to different domestic markets across the country can be beneficial to FPOs as they can act as good hedge against price risk. Lower prices in one region do not translate to low prices in another region. Hence, FPOs can sell their produce across different domestic markets.

2.2.2 Competition

Competitors for FPOs of Maharashtra in domestic markets are States that produce significant quantities of strawberries. Hence, the main competition for suppliers from Maharashtra is from Haryana followed by Meghalaya and Mizoram. Strawberry seasons across all producing regions overlap due to climatic requirements.

Table 16: Peak and Lean months of supply of major strawberry producing States in India

| States | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|-------------|------|------|------|------|-----|-----|-----|-----|-----|-----|------|------|
| Haryana | Peak | Peak | Lean | | | | | | | | | Lean |
| Meghalaya | Peak | Peak | Lean | Lean | | | | | | | Lean | Lean |
| Mizoram | Peak | Peak | Lean | Lean | | | | | | | Lean | Lean |
| Maharashtra | Peak | Peak | Lean | Lean | | | | | | | Lean | Lean |

Months of Peak Supply
 Months of Lean Supply

Strawberries from other states are not usually supplied to Maharashtra. In the Northern States, Maharashtra's strawberries compete with those from Haryana, Punjab, and Jammu, while in the Eastern States, competition is from Meghalaya, Mizoram, and Chhattisgarh. Strawberries from Mahabaleshwar in Maharashtra are known for their high quality and is preferred by many domestic markets.

2.2.3 Maintaining Quality Standards and Supply

Domestic markets accept all grades of custard apples as there is demand for all grades at respective price points. Grading pattern would differ from market to market and from season to season. The grading scheme that is practiced in Mahabaleshwar (the major producing region for strawberries in Maharashtra) is provided in the table below.

| Grade | Size | Physical appeal |
|---------|-------------------|---|
| Grade A | Greater than 18 g | Red colour Free from surface damages |
| Grade B | 12-18 g | Red colour Minimal surface damages |
| Grade C | Less than 12 g | Light red colour |

Grading is dependent both on the size and the physical appeal of the fruit. Some varieties of strawberries bear large fruit weighing 40-80 g per piece. These varieties are grown in small quantities and are not graded as per above mentioned size.

Strawberry varieties keep changing year-on-year, depending on the varieties of mother runner plant imported in that year. Hence, the end consumer demand is not for any particular variety, but on the size and physical appeal of the fruit. Brilliance is the major sweet variety of strawberry that is cultivated in Maharashtra, and it has good demand due to its sweet taste. FPOs looking to send strawberries to distant markets should procure higher shelf life varieties like Camarosa and Nabila.

Unlike other fruits, many strawberry growers sort, grade, and package their produce at farm-level. Due to the temperature sensitivity of strawberries, they should be sent by reefer trucks to distant markets. Apart from investing in packhouse facility for sorting, grading, and packaging, FPOs can set up pre-cooling unit. Pre-cooling strawberries before loading on to reefer trucks helps in maintaining the quality of the fruit.

Multiple packaging options are available for strawberries. The most common packaging is in punnets of 200-250 g, which are again packed in CFB trays (secondary packaging) of 2 kg each. This two-layers packaging is also suitable for sending strawberries to distant domestic markets. Large strawberries (40-80 g per piece) are packed in plastic baskets by providing padding on all sides with paper. Punnets are not suitable for packing large strawberries as only 3-4 fruits can be accommodated in each punnet.

The quality requirements of major markets for strawberries from Mahabaleshwar is provided in the table below.

| Market | Quality Requirement |
|-----------|--------------------------------------|
| Chennai | 80-90% Grade A |
| Bangalore | Mixing of all grades |
| Hyderabad | Mixing of all grades |
| Kolkata | Grade A and B of big fruit varieties |

Regular practice of packaging at farm level provides easy opportunity for farmers / FPOs to market strawberries in their own brand. This can help the FPOs in slowly building a brand, at B2B level, in custard apples, wherein traders in different markets can depend on the FPO to send high quality strawberries.

2.2.4 Pricing

Pricing in domestic markets depends on the day-to-day supply-demand dynamics. Hence, FPOs can command good price only by supplying good quality produce to the market. FPOs can sort and grade their produce and get premium pricing for top grade produce. Unlike many other horticulture commodities, grade-wise procurement, subsequently pricing, is prevalent for strawberries in *Mandis*.

The table below provides the average range of strawberry prices in Maharashtra. Strawberry being a seasonal fruit, is highly demanded during its harvest season. Hence, the market prices vary on the local production (supply) scenario.

| Grade | Price in Peak Season | Price in Lean Season |
|---------|----------------------|--|
| Grade A | ₹100 to 150 per kg | ₹400 to 500 per kg |
| Grade B | ₹60 to 80 per kg | Lean season supply is called the “starting fruit”. No Grade B and C produce is supplied in the market during this season |
| Grade C | Less than ₹60 per kg | |

The big fruit varieties cost ₹150 to 200 per kg. Since the strawberry supply window only for 3-4 months and is mostly from a single region (Mahabaleshwar), price varies sharply within peak supply months. This is caused by climatic factors that affect strawberry production (higher temperature, rainfall).

The cost of a punnet is ₹2-3 per piece, while the secondary packaging CFB trays cost ₹12-15 per piece. Bigger packaging size (cartons accommodating 14-15 kg of strawberries) cost ₹50 per piece.

Traders from different states come to Mahabaleshwar for procurement of strawberries. The transportation cost, hence, is borne by the traders. The cost of reefer transportation to Hyderabad and Bangalore is ₹6-10 per kg and to Chennai is ₹12-15 per kg. The cost of supplying strawberries by air to Delhi and Kolkata is approximately ₹50-75 per kg.

The price of all agriculture and horticulture commodities traded in the Government regulated *Mandis* can be tracked on www.agmarknet.gov.in. The tracking of arrivals and prices for strawberry is limited on the website. Hence, FPOs should actively work to establish source for information on prevailing market prices in markets that it targets to sell its custard apples to.

2.2.5 Establishing Connects

Traders from different markets across the country reach out to farmers in Mahabaleshwar for procuring strawberries. This process is unlike other horticulture commodities since the production of strawberry is very limited in the country. This makes it convenient for FPOs to establish connects with traders from different markets and diversify their supply. Connects with these traders can be done by seeking help from other FPOs or traders dealing in strawberry the region, or by listing on online marketplace platforms such as **Bijak**. Online B2B platforms / trade websites such as www.enam.gov.in, www.farmerconnect.apeda.gov.in, www.kisanmandi.com, www.farmersmandi.in, www.indiamart.com and www.tradeindia.com can also be used for listing of strawberries.

2.2.6 Advantages and Risks Associated

Selling to major domestic markets decreases the price risk significantly. When prices are low in nearby markets, FPOs can sell their produce to other domestic markets wherever feasible. Consistent supply to select traders is necessary for FPOs to build long-term relationship with buyers. This acts as a significant hedge against price variations in the nearby markets.

Since strawberry is traded only in limited quantities, due to low production, only a handful of traders deal in strawberry in each major market. FPOs intending to supply to those markets can go only through those select traders. This can lead to limited price negotiating power for the FPOs.

2.3 Organized Retail and eCommerce

Organized retail and eCommerce are the fastest growing marketing channels for horticulture crops. Organized retail includes large national retail players like Reliance, More, and DMart, and other regional retail companies. Major eCommerce companies dealing in horticulture crops are BigBasket, Swiggy, Amazon, and Flipkart. Agri supply chain startups that procure from farmers and supply to various channels such as WayCool and Ninjacart are also categorized as eCommerce.

2.3.1 Characteristics of the Segment

Strawberry is an important fruit for this market segment during the winter season (harvesting months of strawberry). The target customers of these market players are the major consumers of strawberry in the country. Hence, this segment is a large buyer of strawberries unlike for other horticulture commodities.

Many large, organized retail and eCommerce market players try to procure directly from Mahabaleshwar or through B2B eCommerce companies. This has led to these market players actively working with farmers / FPOs for procurement of strawberries. Many market players have also established their own collection centers in Mahabaleshwar for procurement or have developed capabilities of aggregators to supply as per their requirement.

2.3.2 Competition

FPOs looking to supply to market players in this segment are competing with farmers / suppliers from Northern producing states. Haryana, Punjab, and Jammu have the advantage of geographical proximity to NCR. Apart from lower logistics cost, the shelf life is also longer since the time from farm to retailer is significantly lesser than when supplied from Mahabaleshwar by road.

2.3.3 Maintaining Quality Standards and Supply

Organized retail and eCommerce companies require high quality (Grade A and B) produce. Big fruit strawberry varieties are not preferred by these market players and are usually supplied to standalone premium retailers in high-end neighborhoods through *Mandis*.

| | |
|----------------------|--|
| Varietal Preferences | No varietal preferences |
| Colour | Even pinking red across the fruit |
| Size | <ul style="list-style-type: none">• At least 15 g per piece• 3.0-4.5 cm in length• 2.5-3.5 cm in width |

Criteria for rejection

Ruptures / bruises on peel, mechanical damage, rotting, under-ripen (very light red / pink surface)

FPOs should ensure that it delivers on the quality requirements of these market players consistently to build long-term business relationship. Since strawberry is a seasonal crop, FPOs would be in touch with these market players only for few months in a year. Hence, it is necessary that season-on-season FPOs are able to supply the required quality and quantity to these market players.

To supply good quality produce, FPOs can invest in packhouse infrastructure, training of farmers on harvesting, and training of labour for handling the fruits during sorting and packaging. Strawberries are highly susceptible to physical damage if not handled with care. Punnets is the preferred packaging for this market segment. Punnets are again packed in CFB trays to provide additional protection and ease of transportation.

2.3.4 Pricing

The pricing for this category is dependent on the prevalent market price in Mahabaleshwar. Due to high concentration of supply from a small geography, there is good competition on pricing during peak harvest season. Hence, FPOs should be able to supply to these market players at competitive price in comparison to other supplies in the same region.

Entering into seasonal contracts with these companies in this segment is a win-win situation for both the parties. FPOs can supply at a reasonable and assured price, while the companies are guaranteed of required quality and quantity through the season. Pricing is decided on mutual agreement based on last season(s) markets' price trends. Prices obtained by supplying to these companies may not necessarily be higher than the market prices but FPOs can safeguard themselves against subdued low market prices during peak season.

FPOs will incur cost for labour and packaging material. The cost of a punnet is ₹2-3 per piece, while the secondary packaging CFB trays cost ₹12-15 per piece. Labour cost is dependent on local labour market dynamics.

2.3.5 Establishing Connects

Many market players in the Organized retail and eCommerce segment are already procuring strawberries from Mahabaleshwar and are actively working directly with farmers and FPOs.

FPOs can try to establish connects with this market segment by:

- Through procurement centers of companies in surrounding region
- Through mutual connects who supply to such companies
- Listing on online trade websites such as www.indiamart.com and www.tradeindia.com
- Listing on agriculture / horticulture specific eCommerce platforms such as Bijak
- Various Government Departments / schemes conduct Buyer-Seller meets. FPOs can meet representatives from companies in this segment
- MAGNET project's Buyer-Seller meets. These Buyer-Seller meets offer platform for FPOs to interact with various market players including Organized retailers and eCommerce players
- Following websites give details on different events including Buyer-Seller meets that happen across the country:
 - <https://krishijagran.com/events>
 - <https://www.kisaanhelpline.com/agriculture-events>
 - <https://ficci-web.com/events>
 - <https://www.2exhibitions.com/agriculture-and-forestry/>

2.3.6 Advantages and Risks Associated

FPOs that have / can invest in building good post-harvest infrastructure can fetch better returns for their Grade A and B strawberries. This segment is growing rapidly, hence making good business relationship with customers of the segment can lead to long term benefits for FPOs. Some companies in these segments also invest in capacity building and post-harvest infrastructure such as collection centers, which the FPOs can leverage. FPOs can enter seasonal contracts with these companies and sell at profitable prices with reduced risk. Payment default risk is also lower with these companies.

Companies in this segment function on credit terms, though credit terms to FPOs can be as short as 3 days or as long as 15 days. Rejections and price cuts due to quality issues can be common occurrence as they can have strict quality norms. Since these customers procure from different custard apple production regions and from numerous sellers, the pricing power with FPOs is low during negotiations.

2.4 Processors

Processors are manufacturing units of secondary or tertiary processed products of strawberries. They can be big processing units, MSMEs or cottage industries.

2.4.1 Characteristics of the Segment

Processors segment is highly price sensitive, and usually procure medium-low grade strawberries. The quantity of procurement depends on the end product being manufactured. Manufacturing strawberry crush, jams, and marmalades require strawberry as the main ingredient, and hence processors manufacturing these products procure in high quantities.

Since strawberry is a seasonal crop, large processing units procure strawberries whenever the supply is high (and price is low) during the season. They are capable of procuring large quantities, in spite of short shelf-life of strawberries, because of their capability to immediately process or freeze the fruits and store it for long duration.

2.4.2 Competition

For an FPO looking to supply to processors, its competitors are other FPOs and traders in their production region along with the traders local *Mandis*. The processors also tend to have long-standing relationship with select suppliers, as the suppliers understand their requirements. Large processors usually procure from multiple states to have consistent supply throughout the year.

2.4.3 Maintaining Quality Standards and Supply

Processors do not usually function with strict quality requirements, especially in terms of colour, size and physical defects. Since they are highly price sensitive, they procure medium-low grade strawberries.

| | |
|----------------------|---|
| Varietal Preferences | Sweet Charlie, Camarosa, Winter Dawn, Nabila Varietal preferences are not strict |
| Colour | Red with patches of pale red / yellow is acceptable |
| Size | 15-40 mm Small size fruits are also acceptable |
| Defects | Surface damages, slightly immature fruits are acceptable |

Apart from the parameters mentioned above, Brix content is also a consideration factor during procurement for some processors. Minimum brix content of 8° is preferred to ensure natural sweetness in the processed products.

FPOs should target for supplying to processors only if it does sort and grading of their produce. Most processors less quality conscious and hence can be supplied lower grade strawberries.

Processors generally procure strawberries in the quarter of the season – end of January to March mid. The quality of fruit is low during these months and the physical appeal of the fruit also decreases. Hence, processors procure heavily during this window for their rest-of-the-year requirement.

2.4.4 Pricing

Since the processors procure in large quantities and of lower grades, they tend to maintain a procurement price lower than the market price. The price of lower grades drops to as low of ₹25-50 per kg during the end of season, at which price point processors procure in large quantities.

Small scale processors and cottage industries operate at the day-to-day market prices. FPOs supplying to them have to match the prices that is prevailing the market for the required grade of strawberries.

Many strawberry processors are located around Mahabaleshwar, minimizing the logistics cost for FPOs.

2.4.5 Establishing Connects

FPOs can supply strawberries to processors in its region, and many processors are also located around the production region. FPOs can try to establish connects with this market segment by:

- Approaching processors in their region directly
- Through mutual connects who supply to such companies
- Listing on online trade websites such as www.indiamart.com and www.tradeindia.com
- Various Government Departments / schemes conduct Buyer-Seller meets. FPOs can meet representatives from companies in this segment
- MAGNET project's Buyer-Seller meets. These Buyer-Seller meets offer platform for FPOs to interact with various market players including Organized retailers and eCommerce players

2.4.6 Advantages and Risks Associated

Long-term business association with processors ensures a steady market for the lower grade strawberries. Presence of large processors in Mahabaleshwar and nearby region, provides ease in dealing with them for FPOs.

Processors might function on long credit cycles from 15 to 60 days leading to payment default risk.