

Market Access Plan for Green Chilli

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

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1 Crop Background

Green chillies are chillies that are yet to fully ripe and have been harvested when green in colour. It adds flavor and heat to dishes and is available in a wide range of pungency. Green chilli is rich in nutrients such as vitamin C and is known to provide numerous health benefits. It is an important pepper that is an integral part of various cuisines such as Indian, Latin American, Mexican, Southeast Asian, African, and East Asian.

1.1 Global Scenario

1.1.1 Production

According to FAO, the total area under green chilli cultivation is more than 20 lakh hectares producing 361 lakh MT of chilli. China is the top producer of green chilli producing 1.66 lakh MT, which is 46% of the world's green chilli production. India is the second largest both in terms of area under production and quantity of production. Productivity of green chilli in India is at 10.62 MT/ha (2020-21), which is significantly lower than the estimated global productivity of 17.46 MT/ha.

Table 1: Top 10 Countries by Green Chilli Production – 2020				
S. No.	Country	Production (MT)	Area (ha)	Productivity (MT/ha)
1	China	1,66,80,927	7,37,539	22.62
2	India	43,63,170	4,10,902	10.62
3	Mexico	28,18,443	1,57,911	17.85
4	Indonesia	27,72,594	3,14,772	8.81
5	Turkey	26,36,905	91,491	28.82
6	Spain	14,72,850	21,750	67.72
7	Egypt	10,55,605	58,402	18.07
8	Nigeria	7,62,174	1,01,350	7.52
9	Algeria	7,17,659	22,152	32.40
10	United State of America	7,15,220	19,668	36.36
World		3,61,36,996	20,69,990	17.46

Source: India data – Department of Agriculture and Farmers Welfare, Government of India (2020-21); Rest of World data – FAO Stat

The global production of green chilli is growing steadily, albeit at a slow place. The average annual growth rate from 2016 to 2020 is only 1.4%. The below graphs indicates the world production trend through the production quantities of top 10 green chilli producing countries.

Table 2: Production Trend of Top 10 Green Chilli Producing Countries – 2016 to 2022 (MT)						
S. No.	Countries	2016	2017	2018	2019	2020
1	China	1,64,41,862	1,66,48,629	1,67,69,062	1,66,21,258	1,66,80,927
2	India	36,33,993	35,92,000	37,82,939	33,35,255	43,63,170
3	Mexico	27,37,028	32,96,875	33,79,289	32,38,245	28,18,443
4	Turkey	24,57,822	26,08,172	25,54,974	26,25,669	26,36,905
5	Indonesia	19,61,598	23,59,441	25,42,333	25,88,633	27,72,594
6	Spain	11,75,635	12,77,908	12,75,460	14,02,380	14,72,850
7	Egypt	6,14,273	6,76,422	7,32,749	9,56,250	10,55,605
8	United States of America	8,56,160	8,04,039	7,05,790	7,37,319	7,15,220
9	Nigeria	7,55,960	7,59,150	7,58,054	7,60,114	7,62,174
10	Algeria	5,98,638	6,14,922	6,51,045	6,75,168	7,17,659
World		3,36,06,990	3,50,27,947	3,57,17,034	3,60,26,386	3,61,36,996

Source: India data – Department of Agriculture and Farmers Welfare, Government of India; Rest of World data – FAO Stat

1.1.2 Important Varieties

Thousands of varieties of chillies are cultivated across the world, both fresh and dry chilli varieties. Many varieties are interchangeably consumed both as fresh and dry. Five major species of chillies are cultivated, namely, *Capsicum annuum*, *Capsicum chinense*, *Capsicum frutescens*, *Capsicum bacctum*, and *Capsicum pubescens*. This document shall focus on *Capsicum annuum*, as it is the predominant variety of green chilli grown in India. Some of the major varieties globally of *Capsicum annuum* are briefed below.

Table 3: Major varieties of <i>Capsicum annuum</i> across the World		
Chilli Pepper	The medium-high pungency varieties, that have finger-like shape are chilli peppers. They are consumed both in fresh and dry form. In India, the day-to-day chillies used are primarily of this variety. Hot chillies produced in Southeast Asia are generally of this variety.	

Table 3: Major varieties of Capsicum annum across the World		
Cayenne Pepper	Cayenne pepper are hot pepper varieties, native to Central and South America. They are similar to chilli peppers but are generally red in colour. Their pungency level is similar to or lower than chilli pepper, and they are consumed both fresh and dry.	
Jalapenos	Jalapenos are low pungency chilli varieties, originating from Mexico. They have medium-length pod type fruits, and typically green. They are either consumed as fresh or pickled., are commonly used to add flavor and mild heat to dishes.	
Bell Pepper	Bell peppers are sweet pepper varieties that are native to Central and South American regions. They grow in different attractive colours and are used in fresh form in culinary preparation for their sweet flavor, and crisp and crunchy texture. In India, they are colloquially known as Capsicum.	

1.1.3 Global Trade

Global trade of chillies is classified as fresh and dry. Fresh chillies include both green and red varieties, while dry chillies are primarily dried red chilli varieties. Global trade of green / fresh chillies was more than USD 6 billion in 2020.

Mexico is the top exporter of green chilli exporting 11 lakh MT followed by Spain at 8.85 lakh MT in 2020. Only Mexico and Spain accounted for nearly 50% of global export volume in 2020.

Table 4: Top 10 Countries by Green Chilli Exports – 2020			
S. No.	Countries	Quantity (MT)	Value ('000 USD)
1	Mexico	11,38,288	14,52,567
2	Spain	8,85,992	13,95,320
3	Netherlands	4,67,461	11,70,267
4	Canada	1,71,158	5,05,769
5	Turkey	1,48,820	1,55,314

Table 4: Top 10 Countries by Green Chilli Exports – 2020			
S. No.	Countries	Quantity (MT)	Value ('000 USD)
6	Morocco	1,38,704	1,44,010
7	China	1,26,267	1,17,560
8	United States of America	1,24,532	2,67,035
9	India	95,742	54,773
10	Israel	58,980	1,06,586
World		40,02,712	62,26,810

Source: FAO Stat

Among the top 5 importers, 2 countries are from North America and 3 are from Europe. United States of America, the top importer of green chillies, and Canada, both primarily import from Mexico. The top European importers, Germany, United Kingdom, and France, primarily import from Spain. United Kingdom imports good quantity of green chillies from India.

Table 5: Top 10 Countries by Green Chilli Imports – 2020			
S. No.	Countries	Quantity (MT)	Value ('000 USD)
1	United States of America	11,95,927	18,96,144
2	Germany	4,29,396	9,50,181
3	United Kingdom	2,56,691	5,21,616
4	France	1,80,153	2,91,711
5	Canada	1,39,110	2,91,927
6	Russia	1,31,758	1,75,980
7	Netherlands	1,25,960	2,13,224
8	Italy	84,776	1,23,330
9	Poland	77,286	1,48,940
10	Malaysia	68,999	37,012
World		38,30,128	62,28,353

Source: FAO Stat

The trade (export-import) of green chilli is increasing across the world, with an annual growth rate of 3% between 2016 to 2020. India's green chilli exports are only in the range of 1-2% of the global export volume. The below 2 tables provides the trend in export and import volumes, respectively, of the top 10 major exporting and importing countries between 2016 to 2020. United States of America and Netherlands are both top exporter and importer of green chillies.

Table 6: Export Trend of Top 10 Green Chilli Exporting Countries – 2016 to 2020 (MT)						
S. No.	Countries	2016	2017	2018	2019	2020
1	Mexico	9,49,662	10,37,394	10,52,001	10,71,401	11,38,288
2	Spain	7,34,088	7,17,107	7,75,771	8,69,776	8,85,992
3	Netherlands	3,96,061	4,67,437	4,51,060	4,56,327	4,67,461
4	Canada	1,52,703	1,42,776	1,44,992	1,57,940	1,71,158
5	Morocco	1,10,909	2,00,000	1,75,101	1,31,289	1,38,704
6	United States of America	1,16,514	1,15,951	1,23,632	1,25,508	1,24,532
7	Turkey	97,314	93,242	1,24,472	1,09,975	1,48,820
8	China	89,199	97,788	99,592	1,10,519	1,26,267
9	Israel	59,323	73,754	81,692	67,696	58,980
10	Iran	60,803	58,172	86,560	34,426	50,000
11	India [#]	35,782	44,069	41,028	42,216	95,742
World		33,79,284	36,73,247	37,60,489	37,39,696	40,02,712

Source: FAO Stat

India is not among the top 10 exporters. It has been included in the table for purpose of comparison

Table 7: Import Trend of Top 10 Green Chilli Importing Countries – 2016 to 2020 (MT)						
S. No.	Countries	2016	2017	2018	2019	2020
1	United States of America	10,99,663	11,09,866	11,46,828	11,67,295	11,95,927
2	Germany	3,98,151	4,01,568	4,09,020	3,95,531	4,29,396
3	United Kingdom	2,17,449	2,14,846	2,10,464	2,21,764	2,56,691
4	France	1,64,566	1,62,605	1,71,373	1,66,259	1,80,153
5	Russia	1,12,214	1,39,302	1,65,720	1,62,092	1,31,758
6	Canada	1,34,031	1,33,449	1,41,153	1,45,948	1,39,110
7	Netherlands	86,121	1,11,871	1,10,928	1,09,225	1,25,960
8	Italy	72,573	75,990	84,062	91,196	84,776
9	Poland	57,157	67,982	73,508	78,290	77,286
10	Malaysia	55,904	55,353	63,490	68,079	68,999
World		32,95,012	34,23,580	36,60,311	36,52,517	38,30,128

Source: FAO Stat

1.2 Indian Scenario

1.2.1 Production

India is the second largest producer of green chillies in the world, with an estimated production of 45 lakh MT in 2021-22 over an acreage of 4 lakh hectares. India's productivity of 10-11 MT/ha is much lower than the global productivity of 17-18 MT/ha, and less than half of the largest producer China (22-23 MT/ha).

Table 8: India – Green Chilli Production, Area under Cultivation and Productivity – 2017-18 to 2021-22

Year	Production (MT)	Area (ha)	Productivity (MT/ha)
2021-22 [#]	45,04,943	4,17,820	10.78
2020-21	43,63,170	4,10,902	10.62
2019-20	33,35,255	3,23,285	10.32
2018-19	37,82,939	3,76,520	10.05
2017-18	35,92,000	3,09,000	11.62

Source: Department of Agriculture and Farmers Welfare, Government of India

3rd estimate

Madhya Pradesh is the leading producer of green chilli in India, producing 20% of India's annual production in 2021-22. Maharashtra is the sixth largest producer in India and has a productivity (10.93 MT/ha) slightly higher than the national average (10.78 MT/ha). Tamil Nadu and Andhra Pradesh have very high productivity 26-28 MT/ha, more than double that of national productivity.

Table 9: Top 10 States in Green Chilli Production in India – 2021-22[#]

S. No.	States	Production (MT)	Area (ha)	Productivity (MT/ha)
1	Madhya Pradesh	9,05,250	57,968	15.62
2	Karnataka	7,44,219	58,527	12.72
3	Andhra Pradesh	4,95,274	19,049	26.00
4	Bihar	4,81,332	47,350	10.17
5	Tamil Nadu	3,82,927	13,812	27.72
6	Maharashtra	3,47,257	31,777	10.93
7	Jharkhand	2,57,297	16,022	16.06
8	Chhattisgarh	2,33,378	33,166	7.04
9	West Bengal	2,14,692	63,175	3.40
10	Haryana	1,14,457	11,056	10.35
	India	45,04,943	4,17,820	10.78

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

Maharashtra dropped to the 6th largest producer in 2021-22 from 5th in 2017-2021.

2021-22 [#]	2020-21	2019-20	2018-19	2017-18
Madhya Pradesh	Karnataka	Karnataka	Madhya Pradesh	Karnataka
Karnataka	Madhya Pradesh	Andhra Pradesh	Karnataka	Madhya Pradesh
Andhra Pradesh	Andhra Pradesh	Bihar	Andhra Pradesh	Bihar
Bihar	Bihar	Maharashtra	Bihar	Andhra Pradesh
Tamil Nadu	Maharashtra	Jharkhand	Maharashtra	Maharashtra

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

Maharashtra's share in India's green chilli production has gone down from 9.53% in 2017-18 to 7.71% in 2021-22. Though, Maharashtra saw a significant increase in production from 2019-20 to 2020-21, its production dropped back to 2019-20 levels in 2021-22.

Year	Production (MT)	Area (ha)	Productivity (MT/ha)	% of India's Production
2021-22 [#]	3,47,257	31,777	10.93	7.71%
2020-21	4,08,769	37,586	10.88	9.37%
2019-20	3,45,970	30,483	11.35	10.37%
2018-19	3,27,023	31,863	10.26	8.64%
2017-18	3,42,475	30,586	11.20	9.53%

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

District-wise production of green chilli in Maharashtra is provided in the table below. Nagpur is the top producing district but has lower than average productivity. Palghar, Jalgaon, Aurangabad, and Osmanabad districts have productivity that is nearly double that of the State average.

S. No.	States	Production (MT)	Area (ha)	Productivity (MT/ha)
1	Nagpur	79,210	9,800	8.08
2	Palghar	39,747	1,893	21.00
3	Pune	37,785	2,519	15.00
4	Nandurbar	31,365	1,845	17.00
5	Jalgaon	26,440	1,322	20.00
6	Solapur	19,136	2,392	8.00
7	Nashik	18,147	2,017	9.00

S. No.	States	Production (MT)	Area (ha)	Productivity (MT/ha)
8	Aurangabad	15,040	752	20.00
9	Osmanabad	9,940	485	20.49
10	Amravati	7,428	620	11.98
Maharashtra		3,47,257	31,777	10.93

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

1.2.2 Trade – International

Though India is the second largest green chilli producer in the world, it was the 11th largest exporter in 2020. This is primarily due to strong domestic demand for green chilli due to high consumption. The export quantities have been in range of 35,000-55,000 MT from 2017-18 to 2021-22, except for 2020-21. 2020-21 saw a spike in exports, driven by low value exports to Bangladesh.

Year	Quantity (MT)	Value (₹ Crs)
2021-22	52,370	310
2020-21	92,283	394
2019-20	44,416	260
2018-19	39,735	213
2017-18	44,903	221

Source: Agri Exchange – APEDA

UAE is the largest importer of Indian green chillies, accounting for 60% of India's exports in 2021-22. The Middle East countries, along with UK, which have significant Indian diaspora are top importers of green chilli from India.

Country	Quantity (MT)	Value (₹ Crs)
United Arab Emirates	32,277	209
Bangladesh	8,879	21
Qatar	4,557	34
Oman	3,309	21
United Kingdom	657	9
Bahrain	642	4

Table 14: Green Chilli Export Quantity and Value for Top 10 Destinations from India – 2021-22

Country	Quantity (MT)	Value (₹ Crs)
Nepal	579	1
Bhutan	478	3
Kuwait	477	3
Maldives	154	1
India	52,370	310

Source: Agri Exchange – APEDA

UAE has remained the top importer of green chillies from India over the last 5 years and is growing steadily. Exports to UK, a high value market for Indian green chillies, is in decreasing trend over last 3 years.

Table 15: Export Trend of Top 10 Green Chilli Importing Countries from India – 2017-18 to 2021-22 (MT)

S. No.	Country	2017-18	2018-19	2019-20	2020-21	2021-22
1	United Arab Emirates	24,378	23,302	28,710	31,871	32,277
2	Bangladesh	8,717	3,104	842	49,039	8,879
3	Qatar	2,731	3,498	3,749	4,508	4,557
4	Oman	3,524	4,545	3,276	3,224	3,309
5	United Kingdom	2,412	1,958	2,647	1,092	657
6	Bahrain	1,602	1,414	1,080	821	642
7	Nepal	506	754	2,184	729	579
8	Singapore	13	233	557	140	54
9	Italy	185	214	364	133	33
10	Australia	148	103	149	192	115
	India	44,903	39,735	44,416	92,283	52,370

Source: Agri Exchange – APEDA

1.2.3 Trade – Domestic

Green chilli is traded across the country, through private / unorganized channels and through the Government notified *Mandis*. The price in domestic trade is dependent on supply-demand dynamics.

Major markets for green chillies are the *Mandis* either in large urban centers or near high green chilli producing regions. Below table provides the total arrivals and average modal price in *Mandis* with highest green chilli arrivals during 2021, as per AGMARKNET.

Table 16: Arrivals and Modal Price in Major Green Chilli <i>Mandis</i> – 2021		
<i>Mandi</i>	Arrivals (MT)	Average Modal Price (₹/quintal)
Azadpur (Delhi)	92,246	2,072
Mumbai (Maharashtra)	61,003	3,634
Bowenpally (Telangana)	47,245	2,756
Ahmedabad (Gujarat)	28,376	2,260
Vadodara (Gujarat)	21,768	1,833
Surat (Gujarat)	21,181	2,263
Pune (Maharashtra)	16,947	2,609
Gudimalkapur (Telangana)	16,536	1,613
Gorakhpur (Uttar Pradesh)	14,770	2,581

Source: AGMARKNET

Mumbai, Pune, Nagpur, and Nashik are the major consumption centers in Maharashtra. The arrivals of green chilli in these *Mandis* is provided in the table below.

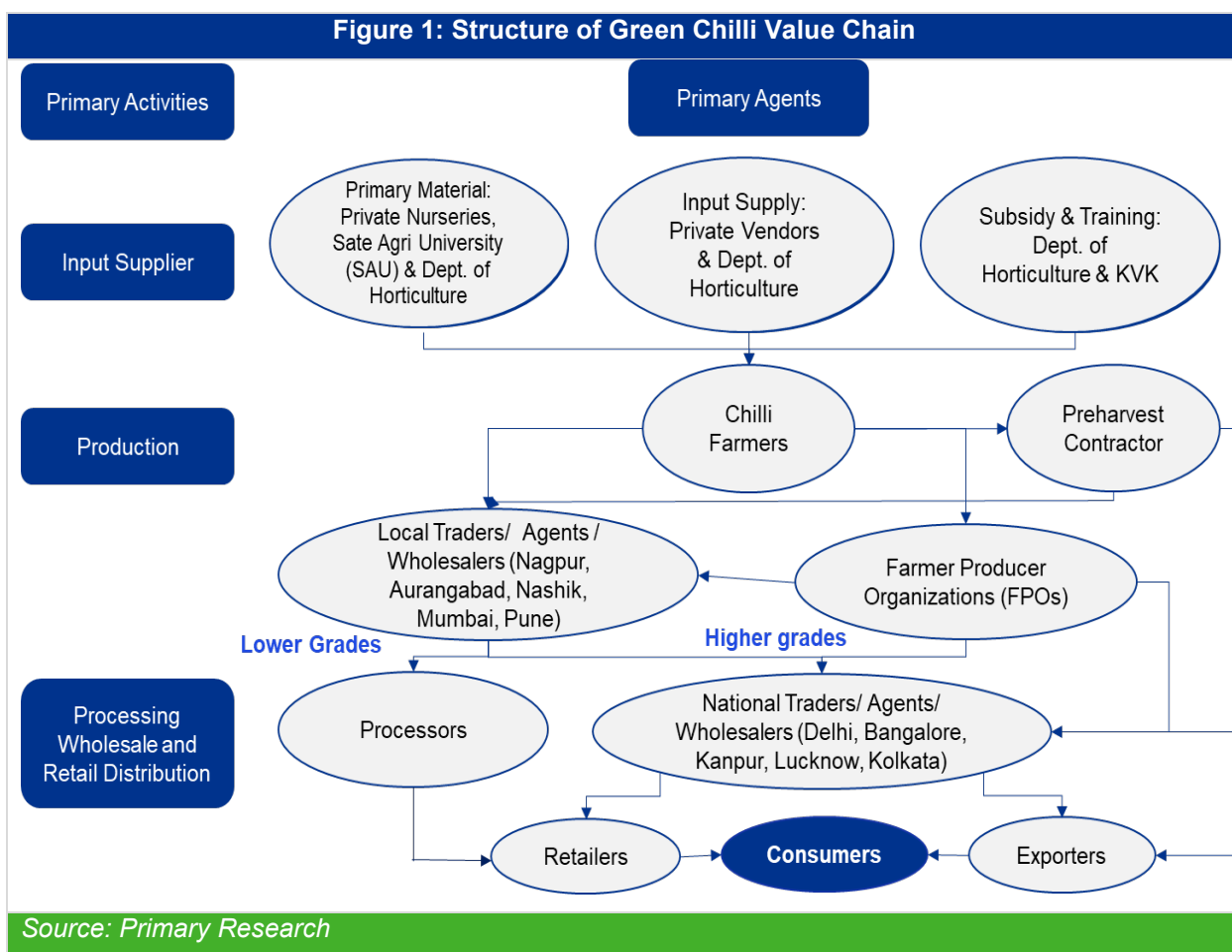
Table 17: Green Chilli Market Arrivals in Major Cities of Maharashtra – 2021 (MT)				
Months	Mumbai	Pune	Nagpur	Nashik
January	6,994	1,671	395	59
February	6,251	1,642	725	93
March	4,059	1,579	435	0
April	3,805	695	188	0
May	4,362	2,028	536	0
June	4,717	1,395	642	0
July	4,654	1,461	362	451
August	8,133	1,493	358	620
September	5,476	1,735	293	211
October	5,450	1,341	452	242
November	5,558	1,440	220	110

Table 17: Green Chilli Market Arrivals in Major Cities of Maharashtra – 2021 (MT)				
Months	Mumbai	Pune	Nagpur	Nashik
December	5,985	1,953	134	336
Total	65,444	18,433	4,740	2,122

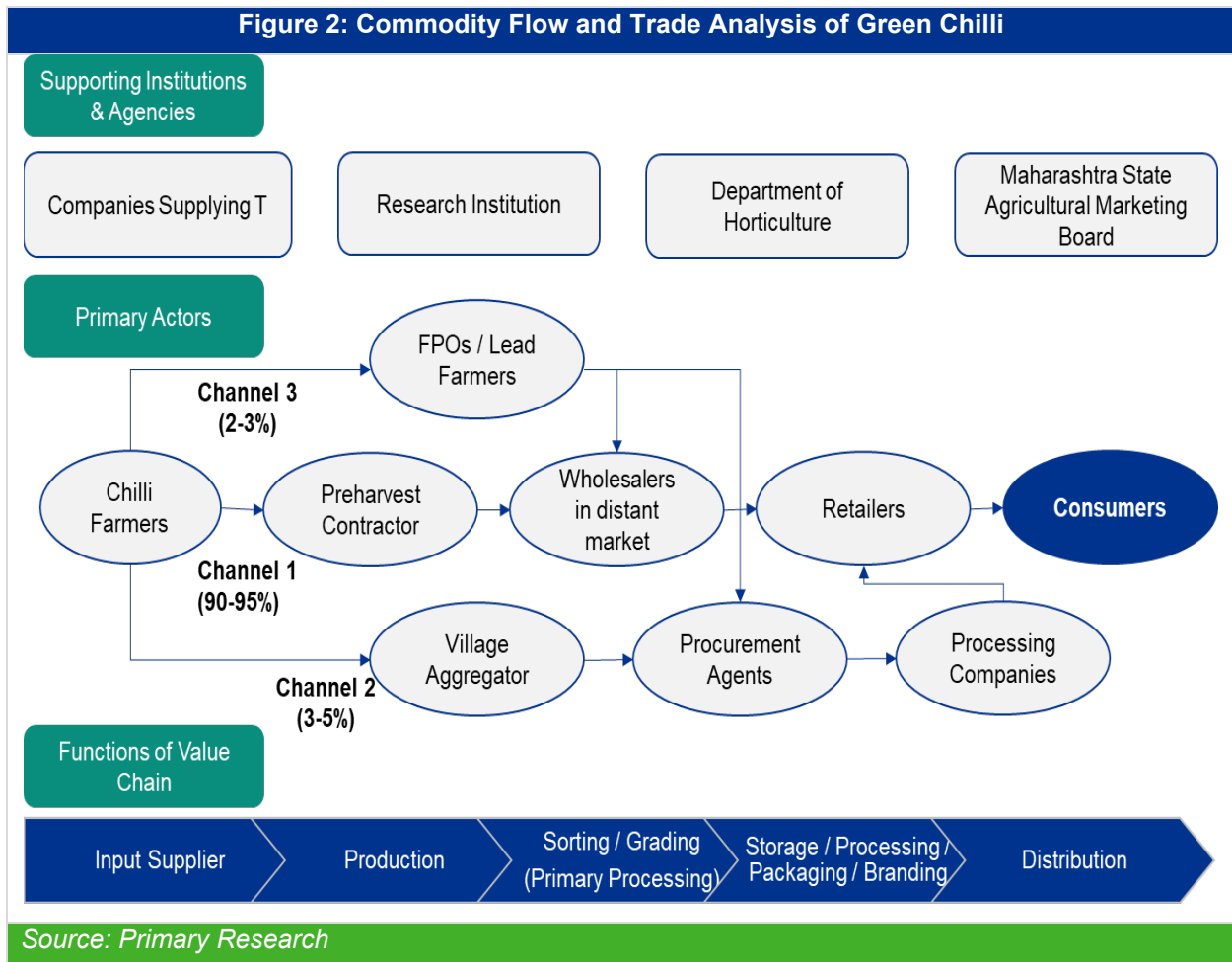
Source: AGMARKNET

1.2.4 Value Chain Overview

The green chilli value chain starts from seed companies supplying seedlings to nurseries, who in turn supply saplings to farmers. Trainings are provided through Government Departments and Krishi Vigyan Kendras. Chilli farmers sell their produce to local traders or pre-harvest contractors harvest and supply to the required markets. Chillies are supplied from local *Mandis* to major consumption markets across the country. The structure of green chilli value chain is provided in the figure below.



There are 3 primary marketing channels green chilli to reach consumers from farmers. The commodity flow through these marketing channels is detailed in the figure below.



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 business 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 market players 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 market players 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 green chillies in the major market segments, namely, 1) Export Markets, 2) Domestic Markets, 3) Organized retail and eCommerce, 4) HoReCa, and 5) Processors. Key components of this section are:



2.1 Export

Export markets are regions / countries to which green chilli is exported or can be exported from India. Export markets are classified as Indian Sub-Continent, Middle East, Europe, and Other Export Markets for green chilli in this document.

2.1.1 Indian Sub-Continent

Indian Sub-Continent market are the markets in following countries – Bangladesh, Pakistan, Nepal, Bhutan, Sri Lanka, and Maldives.

2.1.1.1 Characteristics of the Segment

India currently exports green chilli to Bangladesh, Bhutan, and Nepal in the Indian Sub-Continent. The export quantities are significantly small, as these countries themselves produce chillies. Import from India many times is ad-hoc to alleviate increasing domestic prices.

Bangladesh has import restrictions on green chillies to protect its local producers, and restrictions are removed by the Government only during low domestic production of green chillies. The country, though imports regularly from India to meet its high domestic consumption, but the imports are regulated by the Government.

Bhutan also has import restrictions on green chillies to protect its local producers. During times of low production / high market prices, the Government of Bhutan imports from India, and it then distributes it to local traders in Bhutan.

The Indian Sub-Continent markets consist of countries that are in the lower-middle income to middle income category. Hence, the consumers are price sensitive and are not highly stringent in quality.

2.1.1.2 Competitors

Within Importing Countries:

The Indian Sub-Continent markets import minimal quantities of green chilli as they produce sufficient quantities on their own. Competition for Indian exports to these markets is the domestic production of green chillies in the respective markets.

With India:

For FPOs from Maharashtra looking to supply to these markets, the primary competition is chillies of other green chilli producing regions in India. Chillies from West Bengal, Uttar Pradesh, and Bihar have cost advantage due to geographical proximity.

Exports to Bhutan and Nepal are sent from West Bengal primarily, followed by Uttar Pradesh, Bihar, and Assam. Maharashtra is the major exporter along with West Bengal to Bangladesh. Green chillies are also exported from Karnataka, Uttar Pradesh, and Bhutan to Bangladesh.

2.1.1.3 Maintaining Quality Standards and Supply

Bangladesh exports are of medium grade due to high price sensitivity in the market. Supply to Bangladesh

Bhutan has a preference for Poblano chilli as they closely resemble the local Bhutanese chilli variety. Bhutan has strict compliance requirements on pesticide limits. Bhutan banned the import of green chillies from India in 2016 due to high pesticide levels. The MRL levels for pesticide residue in food are published by the Government of Bhutan and can be found in the following link - https://www.bafra.gov.bt/wp-content/uploads/2022/08/BMS-012017-PESTICIDE_RESIDUES_IN_FOOD.pdf (The link opens to a document on technical regulations on pesticide residues pursuant to the Food Rules and Regulations of Bhutan 2017. The pesticide residue levels for Bhutan are primarily based on the CODEX standards. The document provides information on the maximum residue levels pesticide/molecule-wise mentioning the relevant crops under each of them)

2.1.1.4 Pricing

Since green chilli is produced across the country in large quantities, export pricing to these markets depends on the prevailing market prices in India and in the domestic market of the importing country.

As per trade data of APEDA, the average price for exports to Bangladesh is in the range of ₹20-25 per kg of green chilli. This price is in the lower range, and of lower grades during peak season in Maharashtra markets.

Exports to these regions is by road, and logistics cost to Bangladesh would range between ₹8-12 per kg, or even higher.

2.1.2 Middle East

The Middle East market includes UAE, Saudi Arabia, Iran, Oman, Egypt, Qatar, Iraq, Kuwait, Syria, Israel, Jordan, and Bahrain.

2.1.2.1 Characteristics of the Segment

The Middle East market has significant Indian diaspora and Indian origin population especially UAE, Qatar, Saudi Arabia, Oman, and Kuwait. Hence, this market has significant demand for many Indian horticulture crops. The purchasing power of consumers in these markets are also high, and they demand high quality fruits and vegetables.

Middle East is the biggest importer of green chilli, with UAE as the top country-wise importer. Other markets for Indian green chilli in the Middle East are Qatar, Oman, Bahrain, and Kuwait.

2.1.2.2 Competitors

Middle East countries import green chillies from India and Thailand, apart from some cultivation done in that region. Green chillies are also imported from African countries such as South Africa and Kenya, though their market share is minimal.

Other Countries:

Thailand exports its Bird's eye chillies, both green and red chillies to the middle east market. This variety of green chilli is slender, 3-4 inches in length and known for its high heat level. This variety of chilli is also grown in Northeastern States in India.

Within India:

From India, chillies are exported majorly from Maharashtra, with the significant exports through Mumbai ports. Exporters procure green chilli from Gujarat and Karnataka also during off-season in Maharashtra to meet the demand from the Middle East markets. Apart from Maharashtra, Gujarat is the other prominent exporter of green chillies to Middle East, though it exports only 50% of Maharashtra's exports (in terms of value). Apart from the regular green chilli varieties, Namdhari chilli variety is exported to the Middle East markets.

2.1.2.3 Maintaining Quality Standards and Supply

Most target countries for export of green chilli in the Middle East are high income countries. Accordingly, only superior quality is preferred by the consumers in those markets. The quality specifications followed by Indian exporters for supply of green chillies to Middle East countries is specified in the table below.

Varieties	G4
Colour	Dark Green
Size	3 to 4 inches in length
Thickness	Slender, thin chillies are preferred
Packaging	3.8 kg packs

CODEX standards are universally acceptable standards for agriculture produce trade. CODEX standards for green chilli can be accessed through this link – https://www.fao.org/fao-who-codexalimentarius/sh-proxy/en/?lnk=1&url=https%253A%252F%252Fworkspace.fao.org%252Fsites%252Fcodex%252FStandards%252FCXS%2B307-2011%252FCXS_307e.pdf. Summary of CODEX standards' specified quality for chillies are summarized in the table below.

Minimum Requirement	<p>Chillies must be,</p> <ul style="list-style-type: none">• whole, the stalk (stem) may be missing, provided that the break is clean and the adjacent skin is not damaged• sound, produce affected by rotting or deterioration such as to make it unfit for consumption is excluded• firm• clean, practically free of any visible foreign matter• practically free of pests and damage caused by them affecting the general appearance of the produce• free of abnormal external moisture excluding condensation following removal from cold storage
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	<ul style="list-style-type: none"> • free of any foreign smell and/or taste • free of damage caused by low and/or high temperatures
Class	<p>Extra Class – Superior quality and free of defects (surface defects less than 0.5% of surface area) (5% tolerance)</p> <p>Class I – Good quality, slight defect in shape, colour, skin allowed (surface defects less than 2% of surface area) (10% tolerance)</p> <p>Class II – Those that do not qualify for the above classes but quality minimum requirement (10% tolerance)</p>
Size (Length)	<p>Size 1: less than 4 cm</p> <p>Size 2: 4 to 8 cm</p> <p>Size 3: 8 to 12 cm</p> <p>Size 4: 12 to 16 cm</p> <p>Size: more than 16 cm</p>
Pungency Level	<p>Mild: 900 to 1999 Scoville unit; 60 to 133 Total Capsaicinoids</p> <p>Medium: 2000 to 19999 Scoville unit; 134 to 1333 Total Capsaicinoids</p> <p>Hot: 20000 to 100000 Scoville unit; 1334 to 6600 Total Capsaicinoids</p> <p>Extra Hot: greater than 100000 Scoville unit; greater than 6600 Total Capsaicinoids</p>
Packaging	<p>Each package should be of a single class with same origin, variety, and quality.</p> <p>Packing material should be clean and new and should comply with Recommended International Code of Practice for Packaging and Transport of Fresh Fruits and Vegetables (CAC/RCP 44-1995, Amd. 1-2004)</p>

Exporters generally procure from traders, instead of farmers, as they provide assured quality. Currently, exporters procure green chilli, sort, pack, pre-cool and transfer to shipping containers for exports. These activities can be undertaken at FPO level to ease the workload on exporters and to fetch higher price for FPOs.

FPOs can develop the following infrastructure to make their produce suitable for exports to Middle East markets – packhouse, washer, and sorting (manual). FPOs can also establish pre-cooling facility and reefer truck facility to maintain the freshness of chillies till the exporters' packhouse. In such cases, FPOs can directly package as per requirement of the exporter and provide green chillies that are ready for export. The infrastructure can also be utilized to supply to premium domestic markets such as Organized Retail and eCommerce.

Supply to Middle East market is throughout the year, with lower exports between March to June, and higher exports during November to February.

It is important that the MRL levels are within limits specified by the importing countries. Saudi Arabia imposed an import ban on green chilli from India for a period of seven months ending in January 2016. This was primarily due to quality of green chillies not meeting the standards, including MRLs, set by the Saudi Arabian Government. Saudi Arabia follows its own MRL level that is more stringent than the EU prescribed limits. India's exports to Saudi Arabia have become negligible over the last few years due to the MRL restrictions.

FPOs intending to directly export to the Middle East markets can register their packhouse with APEDA, to make it APEDA recognized packhouse, or export through an APEDA recognized packhouse. FPOs directly exporting should ensure that MRL is within prescribed limits of the importing country. The prescribed limits shall be checked by APEDA recognized laboratories through a fixed sampling procedure. List of authorized laboratories for green chilli can be found through the following link - <https://apeda.gov.in/apedawebsite/menupages/RecognizedOrganizations.htm>. *(Through this link, list of authorized laboratories specifically for green chilli can be accessed. Out of the 30 labs notified by APEDA for green chillies, 11 are in Maharashtra.)*

The detailed procedure for exporting green chillies to the Middle East market is available on the following link

https://apeda.gov.in/apedawebsite/Announcements/procedure_for_export_of_green_chillies_10august2021.pdf. *(The document provides details on the procedure for sampling and analysis, requirement of laboratories, responsibilities of exporters / APEDA recognized packhouses, procedure for issuance of phytosanitary certificate and health certificate, role of APRDA and national research centre, and penal provisions.)*

Packaging specifications for green chillies specified by APEDA are available on the following link - [https://apeda.gov.in/apedawebsite/six_head_product/Brochure_07_Green_Chillies_Okra_Papadi_Brinjal_\(Big\).pdf](https://apeda.gov.in/apedawebsite/six_head_product/Brochure_07_Green_Chillies_Okra_Papadi_Brinjal_(Big).pdf). *(The document provides packaging specifications for green chilli, brinjal, papadi, baby corn, and okra. Minimum specifications for packaging 5 kg and 10 kg is provided for chilli. Specifications include material of box, dimensions, number of plies and ventilation holes, type of flute, and material strength factors)*

2.1.2.4 Pricing

The purchase price of green chillies by exporters is towards the higher end of the prevailing domestic market prices. Hence, FPOs can sell in the range of ₹45-65 per kg to exporters. Prices are based on domestic supply dynamics from Maharashtra, Gujarat, and Karnataka.

FPOs will incur costs for washing, sorting, and grading, in the range of ₹1-3 per kg, which are required for exports to middle east. Pre-cooling cost and logistics cost to Mumbai ports is also to be accounted when deciding on pricing.

The costs associated with exporting to UAE are certifications of ₹1500-2000 per container, port handling charges of ₹40,000-60,000 per container, and custom handling agent charges of ₹8,000-10,000 per container for documentation. The shipping charges to Dubai port is \$1,500-2,500 per reefer container full load.

The retail price of Indian green chilli in UAE in December 2022, a month of high arrivals from India, is in the range of AER 14-16 per kg (₹315-360 per kg). In the Middle Eastern market, at retail level, local chillies (cultivated in the Middle East countries) are slightly cheaper in comparison to Indian green chillies in markets such as Saudi Arabia, UAE, and Oman. Thailand green chillies retail at a significant premium (up to 350%) compared to Indian green chilli varieties.

2.1.3 Europe

Europe market includes member countries of the European Union and United Kingdom. Major member countries of European Union that trade agricultural commodities with India, are Netherlands, France, Spain, Germany, Italy, Denmark, and Belgium.

2.1.3.1 Characteristics of the Segment

Europe is one of the biggest markets, along with North America, for export of agriculture commodities from developing countries. Most of the countries in this market are developed economies and have high quality standards for marketing of fresh fruits and vegetables. The purchasing power of consumers of in this market is significantly higher than other markets such as Middle East and Indian Sub-Continent.

Except UK, the presence of Indian diaspora is insignificant in other countries (only Italy and Germany have more than 1 lakh Non-Resident Indians (NRIs), while UK has more than 3.5 lakh NRIs and 14 lakh Persons of Indian Origin). Hence, unlike Middle East market, where the consumption of produce from Indian can be primarily dependent on immigrants from India and neighboring countries, the consumption in Europe should be driven by local population.

The general European cuisines do not have fresh chilli as an ingredient, except for certain countries like Spain and Romania, and few pockets in other countries. Chillies required for local cuisines are cultivated locally, within Europe. Hence, the consumption of fresh green chilli is driven by other cuisines such as Indian, Asian, Latin American, and African. The consumption is largely driven by immigrant population from different regions, and hence the preference for varieties is also in the same lines.

Due to low volume of requirement in individual countries, traders / retailers in different European countries procure Indian origin produce from Netherlands and UK. Netherlands, a major shipping hub for Europe, imports produce from India, which is then distributed across different countries.

UK is the biggest importer of green chilli from India in Europe, and India is the biggest exporter of green chilli to UK. The consumption in UK is primarily driven by the Indian immigrants / Indian-origin population. In other part of Europe, the export of green chilli from India is insignificant.

2.1.3.2 Competitors

Other Countries:

In the UK market, India competes with Uganda, Senegal, Kenya, and Morocco. This is apart from the chillies produced within Europe, mainly in Spain, the Netherlands, and Italy. In rest of the Europe market, Morocco leads the supply followed by Turkey, Uganda, and Kenya.

Morocco, with its proximity to Europe market, and chillies in similar varieties (Cayenne Pepper) to those grown in Spain, has significant advantage in exporting to Europe. It mainly exports to Spain and France.

Turkey focusses on exporting to Eastern Europe market and Germany, where there is significant Turkish population also. Turkey competes on its ability to supply chilli throughout the year and at low prices. It competes with European producers and specialty variety suppliers like Mexico.

African countries such as Uganda, Kenya, and Senegal are known to supply several exotic chilli varieties such as African Bird's eye (fresh red chilli). These chilli varieties are known its high pungency and hotness. But pests and maintaining pesticide levels within limits are a major issue for these countries. The chillies from India and the African countries are sometimes termed as "Finger Chillies" in the Europe market, due to their slender and long shape.

2.1.3.2.1 Competitive advantage with selective countries for export of green chilli

Morocco: Main advantage with the country is the proximity to the European market, coupled with a favorable climate.

Turkey: Greenhouse production of chilli is increasing in the country and chilli grows in different regions. As a result, Turkey can supply chilli peppers throughout the year. Due to its affordable production and price competitiveness, Turkey competes with European producers as well as farther producers.

Uganda: The climatic conditions in the country give chillies a specific taste and spiciness that is preferred by specific buyers in Europe.

Within Europe:

In Europe, fresh chillies are available between June and September, with lean supply during April and May, and October and November. It imports significant quantities during the winter season, i.e., from December to February, due to high cost of cultivation during these seasons.

Fresh chilli competes with dried chillies and processed chilli products such as powders, paste and sauces. This is due to the longer shelf lives of the latter, along with the ease of use. Indian green chilli does not compete with these products since it targets a specific market in need of slender long green chillies.

Within India:

Within India, Maharashtra competes with green chillies from Gujarat and Karnataka for export. Though the quality of Maharashtra green chilli is superior to other States, procurement from these States is done by exporters to maintain supply across the year. Since Europe classifies chillies as fresh and dry, Bhut Jolokia is a competing variety for Maharashtra green chilli varieties. Bhut Jolokia is considered as an exotic variety, as it is known for its high pungency.

2.1.3.3 Maintaining Quality Standards and Supply

Europe market has very high standards on quality of imports for food products. Across all exporting countries, only the top-grade chillies are exported to European markets.

Varieties	G4
Colour	Dark Green
Size	3 to 4 inches in length
Thickness	Slender, thin chillies are preferred
Packaging	5 kg in corrugated fibre board material

Supply of pest infested, or diseased chilli does not comply with the health and phytosanitary requirements of the European markets. Repeated supply of such chilli shall also affect the general supply of green chillies from India, leading to temporary bans. Hence, significant care should be taken to export pest and disease-free, good quality chilli to Europe markets.

CODEX standards are universally acceptable standards for agriculture produce trade. CODEX standards for green chilli can be accessed through this link – https://www.fao.org/fao-who-codexalimentarius/sh-proxy/en/?lnk=1&url=https%253A%252F%252Fworkspace.fao.org%252Fsites%252Fcodex%252FStandards%252FCXS%2B307-2011%252FCXS_307e.pdf. Among the 3 classes, Europe market prefers buying

minimum Class I quality chillies. Summary of CODEX standards' specified quality for chillies are summarized in the table below.

<p>Minimum Requirement</p>	<p>Chillies must be,</p> <ul style="list-style-type: none"> • whole, the stalk (stem) may be missing, provided that the break is clean and the adjacent skin is not damaged • sound, produce affected by rotting or deterioration such as to make it unfit for consumption is excluded • firm • clean, practically free of any visible foreign matter • practically free of pests and damage caused by them affecting the general appearance of the produce • free of abnormal external moisture excluding condensation following removal from cold storage • free of any foreign smell and/or taste <p>free of damage caused by low and/or high temperatures</p>
<p>Class</p>	<p>Extra Class – Superior quality and free of defects (surface defects less than 0.5% of surface area) (5% tolerance)</p> <p>Class I – Good quality, slight defect in shape, colour, skin allowed (surface defects less than 2% of surface area) (10% tolerance)</p> <p>Class II – Those that do not qualify for the above classes but quality minimum requirement (10% tolerance)</p>
<p>Size (Length)</p>	<p>Size 1: less than 4 cm</p> <p>Size 2: 4 to 8 cm</p> <p>Size 3: 8 to 12 cm</p> <p>Size 4: 12 to 16 cm</p> <p>Size: more than 16 cm</p>
<p>Pungency Level</p>	<p>Mild: 900 to 1999 Scoville unit; 60 to 133 Total Capsaicinoids</p> <p>Medium: 2000 to 19999 Scoville unit; 134 to 1333 Total Capsaicinoids</p> <p>Hot: 20000 to 100000 Scoville unit: 1334 to 6600 Total Capsaicinoids</p> <p>Extra Hot: greater than 100000 Scoville unit; greater than 6600 Total Capsaicinoids</p>

Packaging

Each package should be of a single class with same origin, variety, and quality.

Packing material should be clean and new and should comply with Recommended International Code of Practice for Packaging and Transport of Fresh Fruits and Vegetables (CAC/RCP 44-1995, Amd. 1-2004)

Specific requirements on quality, packaging, labelling are provided by the importer, and should be strictly complied with by the exporters.

MRL limits of Europe markets are considered to be the strictest across the world. MRLs adopted by Europe Union is updated regularly and can be found on https://food.ec.europa.eu/plants/pesticides/eu-pesticides-database_en. *(The link provides an option to download the prevailing MRLs in Europe Union markets under the “Pesticides Residue” sub-heading. The latest changes on MRLs can also be tracked under the same sub-heading. MRLs are revised periodically, and exporters should keep themselves updated on the same.)* MRLs indicate the “maximum” allowable levels for different chemicals, but it depends on the importers for more stricter requirements. Many large retailers in Europe can have more stricter standards on MRLs, which the exporter should clarify through the importers. Green Chillies from India are not usually listed by Large Retailers as the market is small, and hence the retail channel for Indian chillies is through local Indian retailers.

Once the crop is harvested, it is important to bring down the temperature of chilli as soon as possible to reduce water losses. The ideal temperatures during transport must be around 7-8°C.

To maintain a consistent supply to Europe markets, it is necessary the FPOs supply chillies that are pest and disease free and comply with MRLs. FPOs can adopt Integrated Pest Management practices among its member farmers to keep a check on residue limits.

Large retailers in Europe provide importance to sustainable and good production practices and demand global certifications such as Global GAP and Fair Trade. FPOs can target obtaining these certifications to make their green chillies more attractive to importers. This step can also provide an entry for Indian green chillies into Large Retailers in Europe.

Exporters generally procure from Traders, instead of farmers, as they provide assured quality. Currently, exporters procure green chilli, sort, pack, pre-cool and transfer to shipping containers for exports. These activities can be undertaken at FPO level to ease the workload on exporters and to fetch higher price for FPOs.

FPOs can develop the following infrastructure to make their produce suitable for exports to European markets – packhouse, washer, and sorting (manual). FPOs can also establish pre-cooling facility and reefer

truck facility, to maintain the freshness of chillies till the exporters' packhouse. In such cases, FPOs can directly package as per requirement of the exporter and provide green chillies that are ready for export. The infrastructure can also be utilized to supply to premium domestic markets such as Organized Retail and eCommerce. Establishing infrastructure for primary supply to Europe markets might not be feasible, since the quantities exported from India to these markets are less.

Though the demand for fresh chilli is low during June to September in Europe owing to local production, the demand for Indian green chillies is constant throughout the year. This is because Indian varieties cannot be substituted by local varieties. Hence, exporters should supply around the year to these markets. Round the year supply also increases the dependency of the importer and avoids them importing from alternative markets that supply similar varieties such as Pakistan and Thailand. FPOs intending to directly export should develop either year-round production capabilities or procure from other markets during off-season such as Gujarat and Karnataka. The peak supply to UK market from India is between November to March, and low supply is between May to August.

FPOs intending to directly export to Europe markets, can register their packhouse with APEDA, to make it APEDA recognized packhouse, or export through an APEDA recognized packhouse. FPOs directly exporting should ensure that MRL is within prescribed limits of the importing country. The prescribed limits shall be checked by APEDA recognized laboratories through a fixed sampling procedure. List of authorized laboratories for green chilli can be found through the following link - <https://apeda.gov.in/apedawebsite/menupages/RecognizedOrganizations.htm>. *(Through this link, list of authorized laboratories specifically for green chilli can be accessed. Out of the 30 labs notified by APEDA for green chillies, 11 are in Maharashtra.)*

The details of exporting green chillies to Europe market are available on the following link - https://apeda.gov.in/apedawebsite/Announcements/procedure_for_export_of_green_chillies_10august2021.pdf. https://apeda.gov.in/apedawebsite/Announcements/procedure_for_export_of_green_chillies_10august2021.pdf. *(The document provides details on the procedure for sampling and analysis, requirement of laboratories, responsibilities of exporters / APEDA recognized packhouses, procedure for issuance of phytosanitary certificate and health certificate, role of APRDA and national research centre, and penal provisions.)*

Packaging specifications for green chillies specified by APEDA are available on the following link - [https://apeda.gov.in/apedawebsite/six_head_product/Brochure_07_Green_Chillies_Okra_Papadi_Brinjal_\(Big\).pdf](https://apeda.gov.in/apedawebsite/six_head_product/Brochure_07_Green_Chillies_Okra_Papadi_Brinjal_(Big).pdf). *(The document provides packaging specifications for green chilli, brinjal, papadi, baby corn, and okra. Minimum specifications for packaging 5 kg and 10 kg is provided for chilli. Specifications include material of box, dimensions, number of plies and ventilation holes, type of flute, and material strength factors.)*

2.1.3.4 Pricing

The purchase price of green chillies by exporters is towards the higher end of the prevailing domestic market prices. Hence, FPOs can sell in the range of ₹100-150 per kg to exporters. High prices to Europe market is due to the strict compliances in terms of residue limits. FPOs would have to incentivize its farmers to adopt Integrated Pest Management practices to get consistently compliant produce. Prices are also based on domestic supply dynamics from Maharashtra, Gujarat, and Karnataka.

FPOs will incur costs for washing, sorting, and grading, in the range of ₹1-3 per kg, which are required for exports to middle east. Pre-cooling cost and logistics cost to Mumbai ports is also to be accounted when deciding on pricing. The shipping cost of export to UK ports and Rotterdam port (Netherlands) from Mumbai is in the range of USD 5000-7000 per reefer container. Shipping costs are based on supply-demand, are keep varying throughout the year. Exports to Europe will also involve significant costs for certifications and MRL checking, and customs handling agent charges, and port handling charges

Since Europe has demand for internationally recognized certified products such as Global GAP, FPOs adopting these certifications can demand higher prices for their produce.

2.1.4 Other Export Markets

Various types of fresh chillies are consumed across the world, and there is demand for specific varieties of chilli. The demand for chilli is significantly based on the variety of chilli, as consumers have specific preference in chillies. Chilli consumption is also driven by immigrants to a large extent, and hence the demand for specific varieties. Apart from the export markets, other markets are North America, South America, and Africa.

North America: Chilli is exported to USA and Canada in small quantities, primarily for the Indian diaspora in the countries. The cost of Indian green chilli is very high since the transit is done by Air (shelf life of green chillies does not suit the long duration of sea transit). Latin American chillies are primarily imported by these countries, due to high immigrant population from these regions.

South America and Africa: Both these markets produce chillies required for consumption and do not import from other markets. These markets are also major exporters of fresh chillies across the world.

2.1.5 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
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

Export Route	Establishing Connects
	<ul style="list-style-type: none"> ● 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

2.1.6 Advantages and Risks Associated

Each export route mentioned in the above sub-section comes with its risks. Not all export route is suitable for all FPOs, and it is necessary for FPOs to understand the risks before pursuing exports through any of the 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 ● Countries can ban import of green chillies 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"> ● 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 compliance is handled by the exporter – only quality adherence is taken care by FPOs

Export Route	Risks / Disadvantages	Advantages
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. Especially for European and North American markets ● Countries can ban import of green chillies 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 green chilli, 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 Competitors

Competitors for FPOs of Maharashtra in domestic markets are States that produce significant quantities of green chilli. States that have green chilli production more than Maharashtra are Karnataka, Madhya Pradesh, Andhra Pradesh, and Bihar. Other major green chilli producing States are Jharkhand, Chhattisgarh, and Tamil Nadu.

In Maharashtra, chilli is cultivated throughout the year across different regions in the State. Similarly, across many States in India, chilli is cultivated throughout the year.

States	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Andhra Pradesh	■	■	■	■								
Telangana	■	■	■	■								
Karnataka	■	■	■								■	■
Tamil Nadu			■	■	■				■	■	■	■
Gujarat	■										■	■
Uttar Pradesh					■	■	■					
Madhya Pradesh	■									■	■	■
Maharashtra									■	■	■	■

During lean seasons of production in the State, green chilli is supplied to Maharashtra's markets from Madhya Pradesh, Uttar Pradesh, Karnataka. Maharashtra peak supply season overlaps with Madhya Pradesh (primarily), Tamil Nadu, Gujarat, and Karnataka. Hence, Maharashtra competes with chillies from these States for supply across the country. Green chillies from Maharashtra are of superior quality, and States that provide comparable quality of green chillies are Gujarat and Karnataka.

2.2.3 Maintaining Quality Standards and Supply

Domestic markets accept all grades of green chilli as there is demand for all grades at respective price points. Grading pattern would differ from market to market and from season to season.

Grade	Size of chilli	Colour of chilli
Grade A	> 6 inch	Dark Green
Grade B	4 to 6 inch	Green

Grade B	<4 inch	Light Green to Reddish Green
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Currently, sorting and packaging of green chillies are done by traders. These activities can be done by FPOs to fetch higher prices for their produce, and also to get quality commensurate pricing. FPOs can invest in packhouse and washer infrastructure to clean, sort and package their produce. There is no standard packaging practices that is required for domestic markets. Packaging is usually done by the commission agents / traders as per the requirement of the final customers. FPOs can deliver green chilli to domestic markets in plastic crates.

Grade-wise sales (sorted) of chillies is not practices across all *Mandis* or commission agents / traders. Hence, FPOs intending to sort and supply their produce to domestic markets should ensure that suitable buyers are available to pay a premium on their produce.

Pre-cooling and cold storage of green chillies is not generally practiced in the domestic markets. This is because there is consistent supply and demand year-round, and hence there is no storage of chillies. FPOs can invest in pre-cooling and storage facilities for temporary storage during price crashes in the market.

During the peak seasons of production in Maharashtra, green chillies are sent to many markets in the Northern States such as Uttar Pradesh (Kanpur, Lucknow), Bhopal in Madhya Pradesh, Amritsar in Punjab, and Delhi. Chillies are also sent to Patna in Bihar and Siliguri in West Bengal in the East, and Ahmedabad (Gujarat) in the West. There is no specific requirement for these markets as they consume all grades of chillies. FPOs trying to sell their produce to major domestic markets should procure in the multiple of truck load quantities (minimum 10 MT). Optimal utilization of truck load that is being sent to distant markets is required to reduce logistics cost.

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. But practice of buying graded green chillies is not prevalent in all markets, as the activity is done by the commission agents or traders, and further supplied to different channels.

The table below provides the average range of green chilli prices across the major production *Mandis* in Maharashtra (Aurangabad, Jalna, Nagpur). The price range of chilli varies widely and can drop to as low of ₹20-25 per kg of Grade A produce.

Grade	Price in Peak Season	Price in Lean Season
Good quality (Grade A)	₹50 to 55 per kg	₹60 to 75 per kg

Medium quality (Grade B)	₹35 to 45 per kg	₹40 to 50 per kg
Poor quality (Grade C)	Less than ₹30 per kg	₹25 to 40 per kg

Transportation cost is ₹5-7 per kg for Delhi and Uttar Pradesh markets, and additional ₹3-5 per kg for markets further north and Eastern markets.

For supplying to other domestic markets in the country, it is necessary to understand the pricing trends during the concerned week in those markets. Supplying to markets outside the State might not always fetch better prices for the FPOs. Costs related to transportation and loss of quality / weight during transportation should also be accounted. Green Chilli can be transported through refrigerated trucks for long distant transportation to maintain freshness and quality.

www.agmarket.gov.in is the Government portal that provides information on the maximum price, minimum price, and modal price of green chilli at all markets in a particular day / week / month where green chilli is being traded. FPOs can use the portal to understand the pricing trend before sending their produce to distant *Mandis*.

The below chart provides modal price comparison between major green chilli markets in Maharashtra, and markets of major cities in India. Distant markets or markets in major cities doesn't necessarily provide higher prices than the regional *Mandis*.

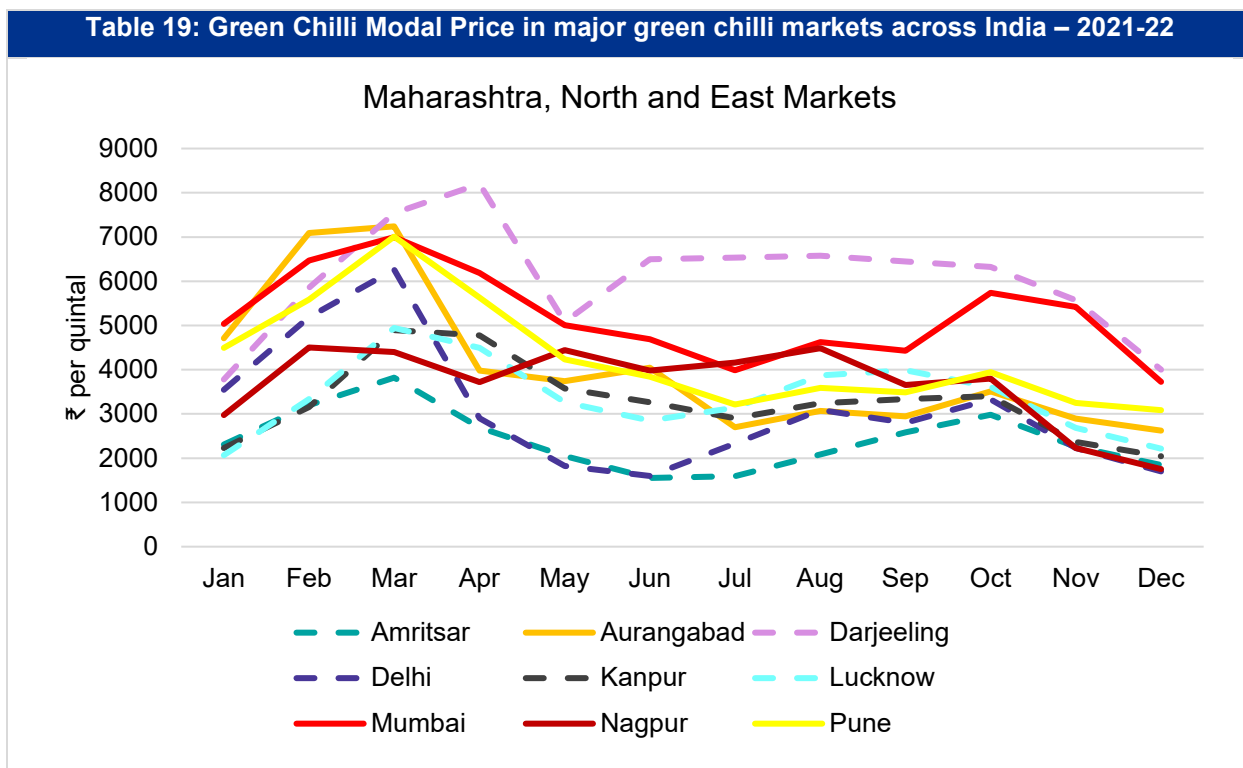
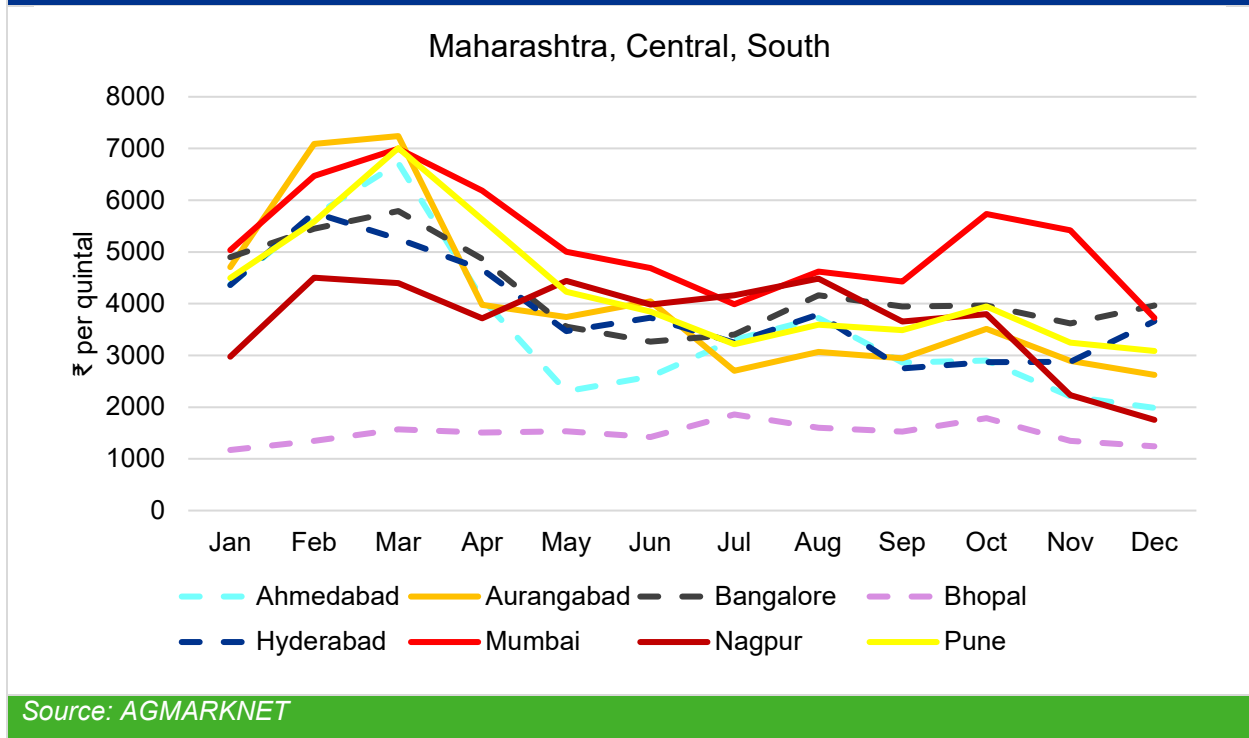


Table 19: Green Chilli Modal Price in major green chilli markets across India – 2021-22



Domestic markets tend to be quality agnostic, hence do not usually pay premium for good quality produce. It also prefers all quality produce so that it can supply to its wide customer base. Selling in domestic markets (through *Mandis*, traders) may not be the most profitable channels for the FPOs. FPOs that can sort and grade their produce, should have sell through other channels that require specific quality of green chillies. Nonetheless, domestic markets are an important channel as they have consistent demand.

2.2.5 Establishing Connects

FPOs can supply to domestic markets either by taking their produce for auction at *Mandis* or by directly supplying to traders in different markets. Connects can be established through visits to *Mandis* in different cities to meet Commission Agents. It can also be done by seeking help from other FPOs or traders dealing in green chilli in surrounding geography.

Agriculture / horticulture commodities focused marketplace platforms are effective tool for FPOs to find buyers across the country. Trading option for green chilli is available on **Bijak** mobile application. 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 green chilli.

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 major domestic markets is necessary for FPOs to build long-term relationship with buyers. This acts as a significant hedge against price variations in the nearby markets.

Risk of delayed payments or payment defaults is higher when selling to distant domestic markets in comparison to selling in nearby markets. FPOs should also be able to send a complete truck load for optimal logistics cost, thereby should have strong procurement and consistent supply.

2.3 Organized Retail and eCommerce

Organized retail and eCommerce are the fastest growing marketing channel 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

The organized retail and eCommerce market targets the mid-premium to premium consumer categories. Hence, there is significant focus on quality of the produce. The companies in this market usually procure from *Mandis* and from traders / village-level aggregators. Over the recent years, there is significant focus from these companies to procure directly from farmers / FPOs to reduce costs and have more control over quality.

2.3.2 Competitors

FPOs looking to supply to market players in this segment are competing with *Mandis* and traders across the country. These market players procure across the country, where required quality at the right price is available. Hence, farmers / FPOs in other major green chilli producing States such as Madhya Pradesh, Karnataka, Andhra Pradesh, and Bihar are also competitors to Maharashtra FPOs looking to supply to Organized Retail and eCommerce market players. During Maharashtra's peak season of supply (September to December) it competes with Madhya Pradesh, Tamil Nadu, Karnataka, and Gujarat.

2.3.3 Maintaining Quality Standards and Supply

Organized retail and eCommerce companies generally require high quality (Grade A and B) produce. The key to establishing business relationship with this market is to consistently supply the required quality of green chilli.

Parameters	Grade A	Grade B
Varietal Preferences	No varietal preferences	
Colour	Dark green	Green
Size	3-4 inch	2-3 inch
Criteria for rejection	Broken, damaged, rotten, over-ripen, borer infested, shriveled, rotten, without stalks, dried stalks	

FPOs should ensure that it delivers on the quality requirements of these market players consistently to build long-term business relationship. To obtain good quality produce, FPOs can invest in packhouse, washing and sorting infrastructure. Washer is required to deliver clean chillies, while sorting can be done manually. FPOs should also pack the chillies in the desired packaging by the market players – crates or corrugated fibre board boxes.

Investing in pre-cooling facilities and cold storage should be as per market demand. Pre-cooling maintains the freshness and quality of produce during long-distance transportation. Cold storage facility would be required if FPO intends to aggregate and supply in batches to the market players, and not daily. Once chilli is stored in cold storage, it is recommended that it is transported in reefer trucks, especially for long distance transportation.

The demand for green chilli is constant throughout the year, while the FPOs' supply depends on the seasons in the region. FPOs, through its member farmers, should plan for regular harvesting throughout the season, to maintain consistent supply. Since green chilli can be grown in both Kharif and Rabi, FPOs can plan for cultivation during both the seasons, to maintain supply to these market players across the year.

2.3.4 Pricing

The pricing for this category is dependent on the prevalent domestic market prices. Since these companies procure from different States to meet their demand, they can easily offset price increase in one market from procuring from another market.

FPOs will incur costs for washing, sorting, and grading, in the range of ₹1-3 per kg, which are required for supply to this segment. Since these markets take regular supply from FPOs, crates can be used to supply for supply as it reduces packaging cost due to reuse.

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.

2.3.5 Establishing Connects

Many market players in the Organized retail and eCommerce segment are actively working towards procuring from farmers and FPOs. They procure from major production regions for each crop, and hence procure from Aurangabad, Nagpur, and Nasik regions from Maharashtra.

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 get good value for their Grade A and B chillies. This segment is growing rapidly, hence making good business relationship with market players of this 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 into seasonal contracts with these companies and sell at profitable prices at reduced risk. Payment default risk is lower with these market players.

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 green chilli production regions and from numerous sellers, the pricing power with FPOs is low during negotiations.

2.4 HoReCa

Hotels, Restaurants and Cafes (HoReCa) segment is a minor consumer of green chilli. This segment also includes different types of eateries and corporate kitchens.

2.4.1 Characteristics of the Segment

HoReCa segment is a highly price sensitive market but less demanding on quality. Since, the focus is on the pungency or taste derived from green chilli, there is less importance to the physical appeal of the product. The segment currently procures from local *Mandis* or wholesalers. Though the segment consumes significant green chilli, the requirement of individual market player is minimal – a hotel or a restaurant would require only few kgs of green chilli per day, but since there are large number of hotels and restaurants, the aggregate requirement is high.

2.4.2 Competitors

For an FPO looking to supply to HoReCa segment its competitors are the local *Mandis* and wholesalers. The HoReCa segment also tend to have long-standing relationship with select suppliers, as the suppliers understand their day-to-day requirements.

2.4.3 Maintaining Quality Standards and Supply

Green chilli of lower grades is suitable for supply to most of HoReCa segment market players. Produce with physical defects are generally accepted in this segment.

Varietal Preferences	No varietal preference
Colour	Green to Light green
Size	<4 inch
Defects	Physical defects are acceptable

FPOs should target for supplying to this segment only if it does sorting and grading of their produce. Most market players in this segment are less quality conscious and hence can be supplied lower grade green chillies.

FPOs should target to supply to this segment with predictable quality and timeline. This segment should be targeted mainly for supply in small quantities and at regular intervals. Based on the FPOs' understanding of the proportion of lower grades it has after sorting, it can fix a certain number of market players in the HoReCa segment to supply. Supply to these market players should then be done throughout its season. Supply should also be ideally done in restricted geography due to low order quantity, and frequent deliveries.

2.4.4 Pricing

In accordance with the quality requirement of this segment, this segment is price sensitive. FPOs may not be able to charge premium pricing for their supply consistency and quality standards. The quality required by these market players are generally available in the local *Mandis*. Hence, it is necessary to maintain the prevailing market prices when supplying to these market players.

Grade	Peak Season – Price Range	Lean Season – Price Range
Grade C	Less than ₹30 per kg	₹25 to 40 per kg

FPOs should also account in for the cost they would incur when delivering to these market players. Low quantities with frequent deliveries that is required by this segment can lead to high logistics cost.

2.4.5 Establishing Connects

Supplying to HoReCa segment can be done only in restricted geography, as the logistics cost should be as minimal as possible. Transportation of only low-grade produce required for this segment over long distance

may not be economically feasible. Hence, the target should be the segment players in a radius of 10-15 kms around the FPOs' packhouse.

Establishing connects with this market is either through mutual contacts or through directly approaching potential market players.

2.4.6 Advantages and Risks Associated

HoReCa segment is a good channel to sell low grade green chilli for FPOs that do sorting and grading of chillies. This segment also has consistent and predictable demand that can help the FPOs for easy planning. The risk of non-payments is minimized as the daily purchase volume per market player is low.

HoReCa segment is price conscious and hence FPOs cannot manage price risk by supplying to this segment.

2.5 Processors

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

2.5.1 Characteristics of the Segment

Processor's segment is highly price sensitive, and usually procure low grade green chillies for processing. Depending on the products they manufacture, they can either buy green chillies in bulk or smaller quantities. Processors who manufacture products that have green chilli as a main ingredient, such as green chilli paste, green chilli sauce, green chilli pickle, procure in large quantities. Other processors buy in smaller quantities.

2.5.2 Competitors

For an FPO looking to supply to processors, its competitors are the local *Mandis* and wholesalers. 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.

2.5.3 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 lower grade green chillies from the market. Some processors might be particular on colour according to the end-product, such as, green chilli sauce / paste.

Varietal Preferences	No varietal preference
Colour	Medium to light green
Size	<3 inch
Defects	Physical defects are acceptable

FPOs should target for supplying to processors only if they do sorting and grading of their produce. Most processors less quality conscious and hence can be supplied lower grade green chillies.

Processors generally maintain a stock buffer and procure on periodic basis. They also function in planned schedules and can provide their requirement quantity and timelines in advance. Hence, supply to processors can be done in batches, as and when it procures sufficient quantity of required grade of chilli. FPOs should target to supply in full truck loads (at least 10 MT) to minimize logistics cost.

2.5.4 Pricing

Industrial processors tend to maintain a procurement price of 10-15% lower than the market price. This is because of the large quantities they usually procure, thus giving an assured market for the suppliers.

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 green chilli.

2.5.5 Establishing Connects

FPOs can supply green chilli to processors in its region (district and surrounding districts). 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 Processors

2.5.6 Advantages and Risks Associated

Long-term business association with processors ensures a steady market for the lower grade green chilli produce. Supply to processors can be done in batches as and when sufficient quantity of required quality green chilli is available with the FPO. Logistics cost can be minimized by doing batched transportation.

Processors usually function on long credit cycles from 15 to 60 days, leading to payment default risk. Industrial processing units may procure in large quantities. Though this might provide FPOs with a large business opportunity, this increases the risk of over dependence on single / handful of market players.