

Market Access Plan for Red Chilli

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

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Contents

1	Crop Background	5
1.1	Global Scenario.....	5
1.1.1	Production	5
1.1.2	Global Trade.....	6
1.2	Indian Scenario	9
1.2.1	Production	9
1.2.2	Important Varieties	11
1.2.3	Trade – International	12
1.2.4	Trade – Domestic.....	14
1.2.5	Value Chain Map.....	15
2	Marketing Strategy.....	17
2.1	Export.....	18
2.1.1	China	18
2.1.2	Southeast Asia	21
2.1.3	Indian Sub-continent	23
2.1.4	Middle East.....	26
2.1.5	Europe.....	28
2.1.6	Establishing Connects.....	32
2.1.7	Advantages and Risks Associated.....	33
2.2	Domestic Markets	35
2.2.1	Characteristics of the Market	35
2.2.2	Competitors	35
2.2.3	Maintaining Quality Standards and Supply	36
2.2.4	Pricing	37
2.2.5	Establishing Connects.....	39
2.2.6	Advantages and Risks Associated.....	39

2.3	Organized Retail and eCommerce.....	40
2.3.1	Characteristics of the Segment.....	40
2.3.2	Competitors.....	40
2.3.3	Maintaining Quality Standards and Supply.....	40
2.3.4	Pricing.....	41
2.3.5	Establishing Connects.....	41
2.3.6	Advantages and Risks Associated.....	42
2.4	Processors.....	43
2.4.1	Characteristics of the Segment.....	43
2.4.2	Maintaining Quality Standards and Supply.....	43
2.4.3	Pricing.....	44
2.4.4	Establishing Connects.....	44
2.4.5	Advantages and Risks Associated.....	44

List of Tables

Table 1: Top 10 Countries by Dry Chilli Production – 2020.....	5
Table 2: Production Trend of Top 10 Dry Chilli Producing Countries – 2016 to 2022 (MT).....	6
Table 3: Top 10 Countries by Dry Chilli Exports – 2020.....	6
Table 4: Top 10 Countries by Dry Chilli Imports – 2020.....	7
Table 5: Export Trend of Top 10 Dry Chilli Exporting Countries – 2016 to 2020 (MT).....	8
Table 6: Import Trend of Top 10 Dry Chilli Importing Countries – 2016 to 2020 (MT).....	8
Table 7: India – Dry Chilli Production, Area under Cultivation and Productivity – 2017-18 to 2021-22.....	9
Table 8: Top 10 States in Dry Chilli Production in India – 2021-22#.....	9
Table 9: Top 10 States in Production from 2017-18 to 2021-22.....	10
Table 10: Maharashtra – Dry Chilli Production, Area under Cultivation and Productivity – 2017-18 to 2021-22.....	10
Table 11: Major Dry Chilli Varieties in India.....	11
Table 12: Dry Chilli Exports from India – 2017-18 to 2021-22#.....	12
Table 13: Dry Chilli Export Quantity and Value for Top 10 Destinations from India – 2021-22#.....	12
Table 14: Export Trend of Top 10 Dry Chilli Importing Countries from India# – 2017-18 to 2021-22 (MT).....	13
Table 15: Arrivals and Modal Price in Major Dry Chilli <i>Mandis</i> – 2021.....	14
Table 16: Dry Chilli Market Arrivals in major Dry Chilli <i>Mandis</i> in Maharashtra – 2021.....	14
Table 17: Seasonality of Dry Chilli Arrivals in the Markets from other Competing Indian States.....	35
Table 18: Dry Chilli Modal Price in major dry chilli markets in Maharashtra and India – 2021-2022.....	38

1 Crop Background

Dry (Red) chillies are chillies that have been allowed to fully ripe, and then harvested and dried. They are usually dark red / brown in colour and have a good spiciness and pungency. They are used as a spice in cuisines across the world, primarily in Indian and Asian cuisines. They are either used in whole, or as powder, pastes, and sauce.

1.1 Global Scenario

1.1.1 Production

According to FAO, the total area under dry chilli cultivation is more than 16 lakh hectares producing 41 lakh MT of dry chilli, spread across Asia, Africa, Americas, and Europe. India is the top producer of dry chilli producing 17 lakh MT which is nearly 40% of the world's dry chilli production. Productivity of dry chilli in India is at 2.49 MT/ha, which is slightly lower than the estimated global productivity of 2.57 MT/ha. China, the third largest dry chilli producer, has significantly higher productivity at 6.68 MT/ha.

S. No.	Country	Production (MT)	Area (ha)	Productivity (MT/ha)
1	India [#]	17,02,000	6,83,000	2.49
2	Thailand	3,22,886	88,177	3.66
3	China	3,07,593	46,048	6.68
4	Ethiopia	2,95,981	1,68,346	1.76
5	Bangladesh	1,57,607	96,901	1.63
6	Pakistan	1,41,541	60,752	2.33
7	Myanmar	1,40,980	1,09,548	1.29
8	Ivory Coast	1,27,642	25,045	5.10
9	Benin	1,08,934	22,287	4.89
10	Ghana	1,08,231	14,513	7.46
	World	41,57,205	16,15,140	2.57

Source: FAO State

[#] Production figures for India differs from the data published by Government of India. Difference can be due to the different time periods taken for a year – Government of India publishes yearly figures for April to March, while FAO provides yearly figures for January to December

There is no clear trend in the global dry chilli production between 2016-2020. Production trends show that there is heavy influence of Indian dry chilli production on global production. During 2019 and 2020, when the dry chilli production dropped in India, the world production also dropped equivalently. The below table

indicates the world production trend through the production quantities of top 10 dry chilli producing countries.

Table 2: Production Trend of Top 10 Dry Chilli Producing Countries – 2016 to 2022 (MT)						
S. No.	Countries	2016	2017	2018	2019	2020
1	India [#]	15,20,390	20,96,000	21,49,000	17,43,000	17,02,000
2	Thailand	3,04,357	3,24,658	3,25,746	3,18,254	3,22,886
3	China	3,09,075	3,07,390	3,07,425	3,07,963	3,07,593
4	Ethiopia	3,29,804	2,64,723	3,07,457	3,13,115	2,95,981
5	Bangladesh	1,30,260	1,36,872	1,41,177	1,49,473	1,57,607
6	Pakistan	1,42,163	1,42,730	1,48,114	1,01,659	1,41,541
7	Myanmar	1,29,361	1,30,592	1,28,072	1,37,110	1,40,980
8	Ivory Coast	1,23,408	1,26,210	1,30,132	1,26,584	1,27,642
9	Ghana	1,06,896	1,08,260	1,08,537	1,07,897	1,08,231
10	Vietnam	95,775	98,158	96,412	96,782	97,118
World		39,50,891	44,91,676	45,66,908	41,26,782	41,57,205

Source: FAO State

[#] Production figures for India differs from the data published by Government of India. Difference can be due to the different time periods taken for a year – Government of India publishes yearly figures for April to March, while FAO provides yearly figures for January to December

1.1.2 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 dry chillies was more than USD 2 billion in 2020.

India is the top exporter of dry chilli exporting 5 lakh MT, which is 50% of the global dry chilli exports. China and Spain are other major exporters of dry chilli, with both exporting primarily to various European countries. Peru and Mexico exports are targeted to North American markets.

Table 3: Top 10 Countries by Dry Chilli Exports – 2020			
S. No.	Countries	Quantity (MT)	Value ('000 USD)
1	India [#]	5,12,587	11,00,580
2	China	2,17,492	5,55,586
3	Spain	74,328	2,17,348

Table 3: Top 10 Countries by Dry Chilli Exports – 2020			
S. No.	Countries	Quantity (MT)	Value ('000 USD)
4	Peru	38,068	95,682
5	Mexico	35,048	67,043
6	Myanmar	16,867	37,701
7	Uzbekistan	13,307	13,453
8	Thailand	9,569	12,436
9	Germany	7,617	43,425
10	Netherlands	7,384	30,859
World		10,17,365	24,53,235

Source: FAO Stat

Trade figures for India differs from the data published by Government of India. Difference can be due to the different time periods taken for a year – Government of India publishes yearly figures for April to March, while FAO provides yearly figures for January to December

China and United States of America are the top importers, importing 1.6 lakh MT each. China, though a large producer, imports large quantities of dry chilli from India. Spain, acts as the gateway of dry chilli to many European markets, wherein it imports dry chilli and processes it to suit regional requirements. South Asian countries – Thailand, Bangladesh, Sri Lanka, Malaysia, and Indonesia, are an important market since dry chilli is a regular spice in their cuisines.

Table 4: Top 10 Countries by Dry Chilli Imports – 2020			
S. No.	Countries	Quantity (MT)	Value ('000 USD)
1	China	1,68,187	3,87,542
2	United States of America	1,62,096	3,89,672
3	Thailand	77,460	1,88,503
4	Spain	67,953	1,30,241
5	Bangladesh	65,844	1,16,981
6	Sri Lanka	50,785	95,025
7	Malaysia	49,348	1,12,425
8	Indonesia	34,812	67,244
9	Mexico	26,813	75,005
10	Germany	26,445	82,629
World		9,99,044	23,58,877

Source: FAO Stat

The trade (export-import) of dry chilli is increasing across the world, with a good annual growth rate of 7% between 2016 to 2020. India, along with China, is driving the dry chilli exports, as together they accounted

for more than 70% of global dry chilli exports in 2020. The below 2 tables provide the trend in export and import volumes, respectively, of the top 10 major exporting and importing countries between 2016 to 2020. China, Spain, Mexico, and Thailand are both top exporter and importer of dry chillies.

Table 5: Export Trend of Top 10 Dry Chilli Exporting Countries – 2016 to 2020 (MT)						
S. No.	Countries	2016	2017	2018	2019	2020
1	India	3,03,972	4,66,704	3,86,277	4,58,866	5,12,587
2	China	1,79,843	1,78,095	2,10,787	2,08,193	2,17,492
3	Spain	56,524	56,519	60,994	65,404	74,328
4	Peru	37,894	31,092	29,203	32,232	38,068
5	Mexico	29,913	27,255	30,400	37,312	35,048
6	Uzbekistan	5,358	9,543	18,114	28,567	13,307
7	Thailand	9,086	12,213	13,895	20,622	9,569
8	Tunisia	10,900	15,649	15,573	13,668	681
9	Myanmar	5,562	6,872	8,423	7,230	16,867
10	Germany	5,988	7,521	7,374	6,954	7,617
World		7,04,130	8,79,335	8,55,489	9,52,821	10,17,365

Source: FAO Stat

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

Table 6: Import Trend of Top 10 Dry Chilli Importing Countries – 2016 to 2020 (MT)						
S. No.	Countries	2016	2017	2018	2019	2020
1	United States of America	1,26,526	1,27,645	1,40,263	1,48,359	1,62,096
2	China	2,112	7,689	81,811	1,68,850	1,68,187
3	Thailand	72,366	89,932	78,812	83,498	77,460
4	Spain	50,283	52,062	51,823	56,922	67,953
5	Sri Lanka	51,040	51,710	51,686	52,744	50,785
6	Malaysia	44,951	43,696	42,414	44,574	49,348
7	Indonesia	29,119	44,644	39,322	47,355	34,812
8	Mexico	38,521	31,562	38,258	36,796	26,813
9	Germany	22,534	23,600	23,672	23,275	26,445
10	Bangladesh	5,692	8,672	3,743	19,028	65,844
World		6,42,702	7,08,970	7,90,727	9,31,895	9,99,044

Source: FAO Stat

1.2 Indian Scenario

1.2.1 Production

India is the largest producer of dry chillies in the world, with an estimated production of 15 lakh MT in 2021-22 over an acreage of 8 lakh hectares. The productivity is in the range of 2.75 to 3.00 MT/ha between 2017-18 to 2020-21. Since, the latest available data is of 3rd estimate, the production figures for 2021-22 are in the lower side.

Table 7: India – Dry Chilli Production, Area under Cultivation and Productivity – 2017-18 to 2021-22

Year	Production (MT)	Area (ha)	Productivity (MT/ha)
2021-22 [#]	15,77,622	8,51,800	1.85
2020-21	20,49,213	7,02,047	2.92
2019-20	19,31,297	6,84,473	2.82
2018-19	17,43,306	7,80,372	2.23
2017-18	21,49,225	7,51,606	2.86

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

Andhra Pradesh, Telangana, and Madhya Pradesh are the top producers of dry chilli in India, producing more than 70% of India's annual production in 2021-22. Maharashtra, is a minor producer of dry chillies, and is the tenth largest producer in India. Maharashtra has the highest productivity among the top producing States at 3.28 MT/ha, which is 75% higher than the national average of 1.85 MT/ha.

Table 8: Top 10 States in Dry Chilli Production in India – 2021-22[#]

S. No.	States	Production (MT)	Area (ha)	Productivity (MT/ha)
1	Andhra Pradesh	4,17,813	2,25,067	1.86
2	Telangana	3,90,812	1,57,116	2.49
3	Madhya Pradesh	3,19,545	1,22,356	2.61
4	Karnataka	1,84,533	1,00,000	1.85
5	Odisha	69,257	71,699	0.97
6	Gujarat	28,778	14,388	2.00
7	Uttar Pradesh	25,410	31,074	0.82
8	Tamil Nadu	24,412	54,173	0.45
9	Assam	20,611	20,307	1.01
10	Maharashtra	18,546	5,648	3.28
	India	15,77,622	8,51,800	1.85

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

Andhra Pradesh, Telangana, Madhya Pradesh, and Karnataka have remained the top producers over the last 5 years.

Table 9: Top 10 States in Production from 2017-18 to 2021-22				
2021-22[#]	2020-21	2019-20	2018-19	2017-28
Andhra Pradesh	Andhra Pradesh	Andhra Pradesh	Andhra Pradesh	Andhra Pradesh
Telangana	Telangana	Telangana	Telangana	Telangana
Madhya Pradesh	Madhya Pradesh	Madhya Pradesh	Madhya Pradesh	Karnataka
Karnataka	Karnataka	Karnataka	Karnataka	Madhya Pradesh
Odisha	Odisha	West Bengal	West Bengal	West Bengal
Gujarat	Tamil Nadu	Odisha	Odisha	Odisha
Uttar Pradesh	Maharashtra	Tamil Nadu	Uttar Pradesh	Gujarat
Tamil Nadu	Gujarat	Maharashtra	Gujarat	Assam
Assam	Assam	Assam	Tamil Nadu	Punjab
Maharashtra	Punjab	Rajasthan	Assam	Rajasthan

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

Maharashtra's production quantity has seen a steady increase from 6,200 MT in 2017-18 to 24,484 MT in 2020-21, growing at an annual rate of 30%. This has led to an increased share for Maharashtra in India's dry chilli production, growing from 0.29% in 2017-18 to 1.18% in 2021-22. Nagpur, Nandurbar, Nanded, Aurangabad, and Jalna are the major dry chilli producing districts in Maharashtra.

Table 10: Maharashtra – Dry Chilli Production, Area under Cultivation and Productivity – 2017-18 to 2021-22				
Year	Production (MT)	Area (ha)	Productivity (MT/ha)	% of India's Production
2021-22 [#]	18,546	5,648	3.28	1.18%
2020-21	24,484	5,605	4.37	1.19%
2019-20	22,434	6,508	3.45	1.16%
2018-19	13,690	5,564	2.46	0.79%
2017-18	6,200	2,340	2.65	0.29%


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

1.2.2 Important Varieties

India, being the global leader in dry chillies, is known for many types of dry chilli varieties. The key differentiating factors between different varieties are pungency (SHU levels) and colour. Combination of these two factors decides the market and demand for dry chillies. The table below details the major varieties of dry chillies cultivated in India.

Table 11: Major Dry Chilli Varieties in India		
Guntur Sannam	It is a traditional variety grown in Andhra Pradesh, Telangana, and Tamil Nadu. Along with Teja, it is one of the largest cultivated dry chilli varieties in India. It is medium-high pungency variety, with SHU levels ranging between 18000-30000 SHU.	
Teja	Teja chilli is a high pungency variety, with SHU levels ranging between 65000-90000 SHU. It is one of the largest cultivated high pungency varieties cultivated across the world. It is primarily grown in Andhra Pradesh, Telangana, and Madhya Pradesh. Maharashtra also has some cultivation of this variety. It has high demand from international markets due to its high pungency.	
Bydagi	Bydagi chilli is known for its deep red / bright red colour and is preferred to be used for chilli powder preparation. It is low-mild pungency with 8000-16000 SHU. It is primarily grown in Karnataka.	
Kashmiri	Kashmiri chilli is known for its dark red colour and has high demand for its powder. It is preferred by consumers to bring colour to the food. It is grown in temperate climatic conditions in Jammu & Kashmir and Himachal Pradesh.	

Table 11: Major Dry Chilli Varieties in India

Bhiwapuri	Bhiwapuri chilli is a popular variety of chilli in the Vidarbha region of Maharashtra. It has earned a GI tag due to its unique non-acidic pungent taste. It is dark red in colour and is short in length.	
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1.2.3 Trade – International

India is the largest dry chilli exporter in the world, exporting 5.57 lakh MT valued at 8,500 crores in 2021-22. The exports steadily increased from 2017-18 to 2020-21, at annual growth rate of 10%. Exports fell in the 2021-22, which can be attributed to lower exports Bangladesh.

Table 12: Dry Chilli Exports from India – 2017-18 to 2021-22[#]

Year	Quantity (MT)	Value (₹ Crs)
2021-22	5,57,168	8,582
2020-21	6,49,815	9,241
2019-20	4,96,000	6,710
2018-19	4,68,500	5,411
2017-18	4,43,900	4,256

Source: Spice Board of India

[#] Figures in this table include dry chilli exported in whole, crushed, and ground form

China is the largest importer of Indian dry chillies, accounting for 35% of India's exports. South Asian countries – Thailand, Sri Lanka, Indonesia, Bangladesh, Malaysia, and Nepal, are also a big market for Indian dry chillies.

Table 13: Dry Chilli Export Quantity and Value for Top 10 Destinations from India – 2021-22[#]

S. No.	Country	Quantity (MT)	Value (₹ Crs)
1	China	1,91,391	3,132
2	Sri Lanka	50,458	693
3	Bangladesh	49,273	498
4	U.S.A	45,336	943
5	U.A.E	44,742	399
6	Thailand	43,839	795
7	Indonesia	37,810	560
8	Malaysia	22,216	440

Table 13: Dry Chilli Export Quantity and Value for Top 10 Destinations from India – 2021-22[#]			
S. No.	Country	Quantity (MT)	Value (₹ Crs)
9	Nepal	11,621	104
10	Qatar	6,580	68
India		5,57,168	8,582

Source: Spice Board of India
Figures in this table include dry chilli exported in whole, crushed, and ground form

Exports to China has grown drastically from 2017-18 to 2021-22, growing at an annual rate of 80%. Though this growth rate is expected to slow date as exports saturate, Indian dry chilli has found a strong customer base in China. Exports to Vietnam has seen a huge decline due to increased domestic production and imports from China. Bangladesh has emerged as an important market for dry chilli exports from India.

Table 14: Export Trend of Top 10 Dry 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	China	9,373	74,903	1,39,966	1,80,221	1,91,391
2	Thailand	60,725	66,197	59,364	59,426	43,839
3	Sri Lanka	51,292	53,186	50,835	52,035	50,458
4	Bangladesh	12,868	25,406	39,551	1,19,616	49,273
5	Vietnam	1,40,552	66,303	9,453	9,221	3,472
6	U.A.E	36,800	29,741	41,233	52,423	44,742
7	Indonesia	32,096	34,849	36,602	36,952	37,810
8	U.S.A	30,164	27,793	30,738	35,172	45,336
9	Malaysia	27,703	31,692	26,084	24,255	22,216
10	Nepal	6,637	6,260	5,869	11,667	11,621
India		4,43,900	4,68,500	4,96,000	6,49,815	5,57,168

Source: Spice Board of India
Figures in this table include dry chilli exported in whole, crushed, and ground form

1.2.4 Trade – Domestic

Dry 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 dry chillies are the *mandis* either in large urban centers or near high dry chilli producing regions. Below table provides the total arrivals and average modal price in *mandis* with high dry chilli arrivals during 2021, as per AGMARKNET.

Market	Arrivals (MT)	Average Modal Price (₹/quintal)
Guntur (Andhra Pradesh)	5,92,111	16,903
Haveri (Karnataka)	1,57,581	13,957
Khammam (Telangana)	94837	11,741
Mumbai (Maharashtra)	19,307	26,219
Nagpur (Maharashtra)	16,662	12,305
Bangalore (Karnataka)	16,561	21,358
Indore (Madhya Pradesh)	9,872	10,698
Jamnagar (Gujarat)	7,164	10,742

Source: AGMARKNET

Nagpur, Nandurbar, and Sangli are major *mandis* near the production regions, while Mumbai as the biggest urban centre also sees lot of dry chilli trade. The arrivals of dry chilli in these *mandis* are provided in the table below.

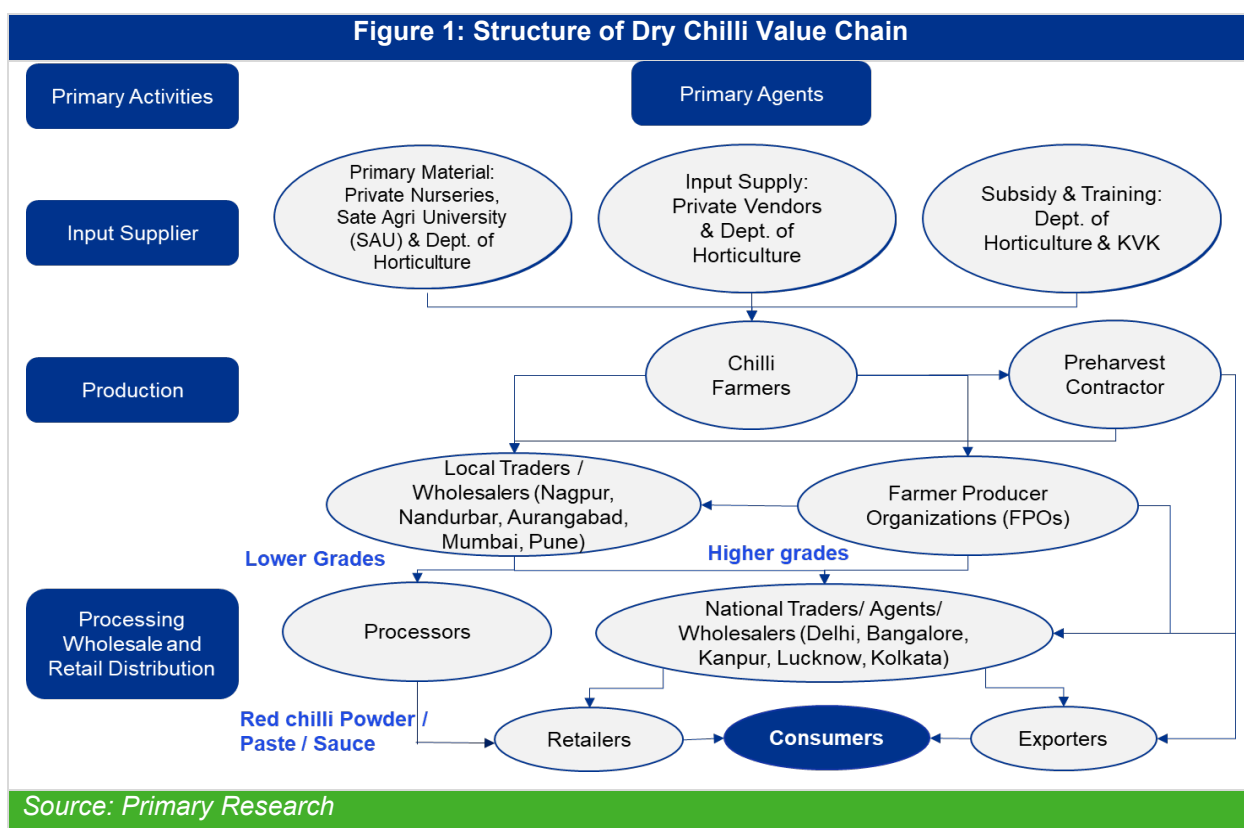
Months	Mumbai	Nagpur	Nandurbar	Sangli
Jan	776	2619	0	124
Feb	4353	2638	0	66
Mar	2980	1619	50	137
Apr	1536	236	35	30
May	928	1426	10	4
Jun	2120	2902	0	4439
Jul	534	788	0	25
Aug	543	495	0	8
Sep	1582	578	272	13
Oct	830	988	2375	4
Nov	1795	1151	17	12

Table 16: Dry Chilli Market Arrivals in major Dry Chilli <i>Mandis</i> in Maharashtra – 2021				
Months	Mumbai	Nagpur	Nandurbar	Sangli
Dec	1330	1222	0	0
Grand Total	19307	16662	2759	4862

Source: AGMARKNET

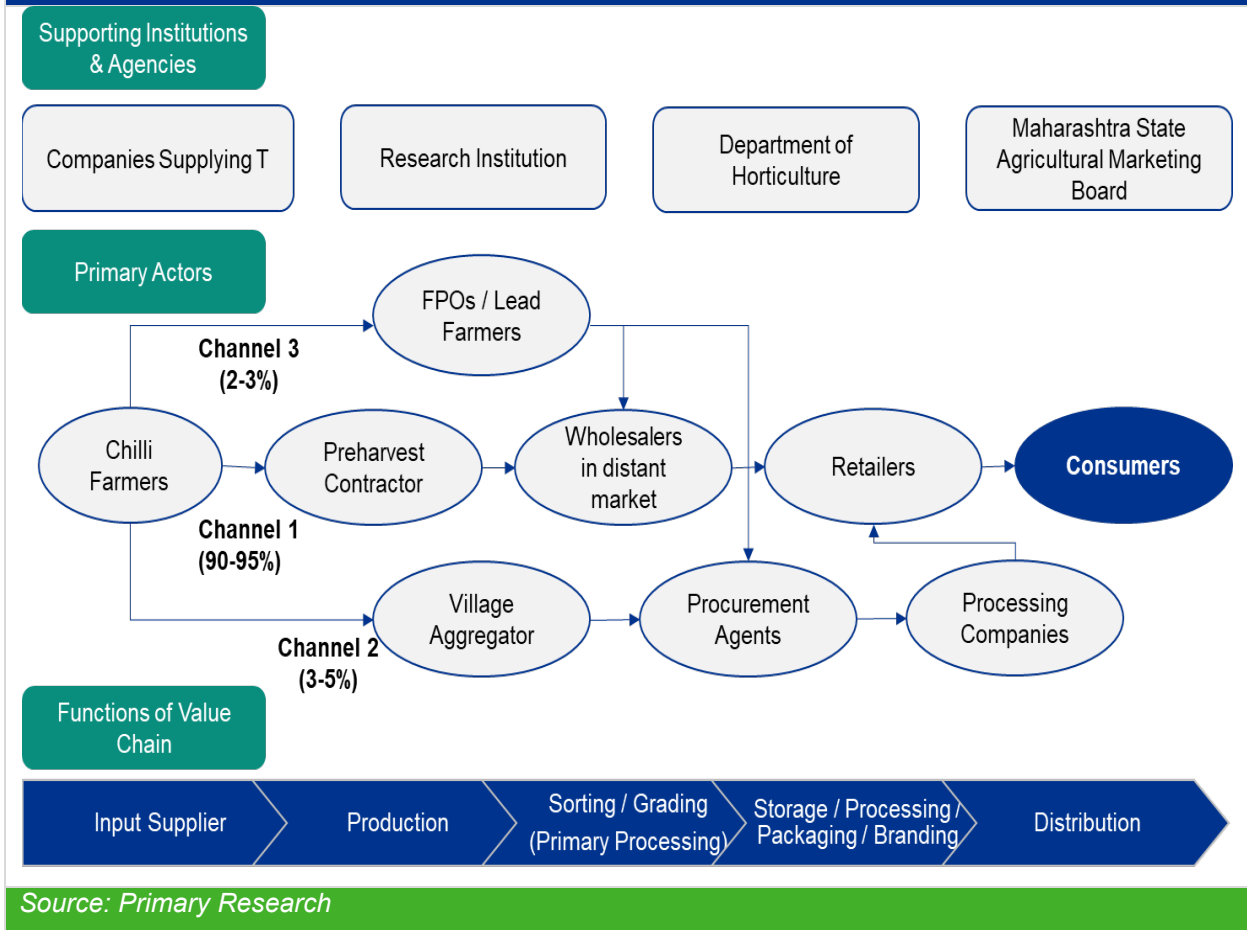
1.2.5 Value Chain Map

The dry 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 either dried by farmers or at the local markets. Dry chillies are supplied from local *mandis* to major markets, exporters, and processors. The structure of dry chilli value chain is provided in the figure below.



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

Figure 2: Commodity Flow and Trade Analysis of Dry Chilli



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 red chillies (dry chillies) 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 Export

Export markets are regions / countries that dry chilli is exported or can be exported from India. Export markets are classified as Southeast Asia and China, Indian Sub-Continent, Middle East, Europe, and North America in this document.

2.1.1 China

2.1.1.1 Characteristics of the Segment

China is one of the highest producers, exporters, and importers of dry chillies in the world. India is the biggest exporter of dry chillies to China, and China is the biggest importer of dry chillies from India. Prior to 2017-18, the imports of dry chillies from India in China were limited. From 2017-19 to 2021-22 there is an estimated increase of 1900% in export volume of dry chillies, with India exporting 1,91 lakh MT in 2021-22.

The increase in import of dry chillies in China is due to the high demand from the local population, as they prefer high pungency of Indian dry chillies. With the Chinese population getting used to the Indian dry chillies and including it as part of their regular diet, the demand from Chinese market is steadily increasing.

2.1.1.2 Competitors

Within China:

China is the second largest producer of dry chillies in the world. It produces high quality dry chillies that are exported in large quantities to European markets. China produces mild pungency paprika chillies which are in high demand in Europe markets over its domestic markets. Though there is an increasing trend of dry chilli imports from India, introduction of new high pungency varieties in China will post a threat to Indian exports.

Other Countries:

China imports dry chillies mainly from Thailand and Vietnam. The chillies exported from these countries are less pungent than Indian dry chillies.

China is also exploring the African markets to import dry chillies, with Rwanda recently been given the green signal to export dry chillies to China. Since these countries also produce medium-high pungency chilli varieties, they can pose a threat to the Indian dry chillies in China.

Within India:

Maharashtra dry chillies are exported only in low quantities to China. From India, most of the exported dry chillies (85-90%) to China come from Andhra Pradesh and Telangana. It is because these two States produce the highest amount of Teja variety (high pungency chilli).

2.1.1.3 Maintaining Quality Standards and Supply

China requires top grades and high pungency chillies from India.

Variety	Teja is the most preferred variety
Physical Characteristics	<ul style="list-style-type: none">• Colour – High Colour (Dark / Bright)• Stemless
Pungency	High Pungency

Teja variety chilli is primarily grown in Guntur (Andhra Pradesh) and Khammam (Telangana) in the country. Maharashtra also grows some quantities of Teja variety chilli in the Nandurbar region. FPOs targeting to export to China should focus on growing high pungency varieties like Teja.

The supply of dry chillies to China happens throughout the year. The supply starts moving up from January and peaks in April and drops till June. Supply again increases from July, peaks in October and drops till December / January.

FPOs can invest in post-harvest infrastructure – drying yards or tarpaulins, solar / electric dryers and packhouse for catering to the export market. Solar / electric dryers can give better quality, in terms of cleanliness and retention of colour, compared to sun-drying yards. Sorting, grading, and destemming of chilli is a labor-intensive process and requires labour willing to work in demanding conditions due to the high pungency of dry chillies (especially Teja and similar varieties). FPOs can also invest in cold storage to supply stocks during the second half of the year, where market arrivals in Andhra Pradesh and Telangana are low.

Nagpur region is a hub for sorting, grading, destemming, packaging of dry chillies for China market. Some exporters bring dry chillies from Andhra Pradesh and Telangana to Nagpur / Bhiwapur for these activities and then ship through Chennai ports. Ports in Chennai and Visakhapatnam are more suitable for exports to China.

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The Spice Board of India oversees the quality control of dry chilli exports. It has implemented mandatory sampling and testing to check for compliance, as per the importing country. Mandatory sampling circular is provided in the following link - <http://www.indianspices.com/trade/trade-notifications/notificationdetails.html?id=316>. *(The link provides access to the sampling circular for all spices – including dry chilli – that can be downloaded. The document details on country/market-wise requirement on chemicals to be monitored along with the maximum limit of residue. Different limits are applicable for whole chilli, chilli powder, and chilli paste.)*

List of Quality Evaluation Laboratory is provided in the following link - <http://www.indianspices.com/quality-evaluation-laboratory.html>. *(The link provides details on the laboratories available for quality testing of dry chilli, the address and contact details of the laboratories, the main instruments available in each of them, accreditation status. Out of the 8 laboratories listed, 1 is in Maharashtra – Mumbai.)*

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2.1.1.4 Pricing

The pricing for the China market is dependent on the prevalent market prices of the Guntur market in Andhra Pradesh. The exports to China peak during April and again in October during a year. The exports from January to May / June is at prices in the range of ₹140-170 per kg, the peak arrivals seasons in Guntur. During the second half of the year, the prices are in the range of ₹180-240 per kg.

Apart from the cost of procurement, the other major costs involved in exporting of dry chillies to China are sorting, destemming, transportation and handling, and documentation related expenses. Sorting, grading, and destemming of chilli costs (labour costs) in the range of ₹15-20 per kg in the Nagpur region. Cold Storage cost depends on the supply-demand situation in the region, and it can range between ₹1-4 per kg per year.

2.1.2 Southeast Asia

Vietnam, Thailand, Singapore, Malaysia, Indonesia, Cambodia, Laos, Myanmar, Philippines, Brunei, East Timor are the countries part of the Southeast Asia region.

2.1.2.1 Characteristics of the Segment

India exports dry chillies to Thailand, Indonesia, Malaysia, Singapore, and Vietnam in good quantities, with the former 3 among the top 10 importers of dry chillies from India. Importing countries such as Indonesia and Thailand produce good quantities of dry chillies on their own while also exporting them.

Many local cuisines in this market use both green chillies and dry chillies, and it is part of their day-to-day staple diet. Hence, these markets consume large quantities and have taken a liking to Indian dry chillies. The preference of Indian dry chillies is due to its good pungency, while the locally produced dry chillies are of mild pungency.

The exports to Southeast Asia market have seen decline in the last five years, with significant decline to Vietnam. This could be because of the increased focus on Chinese market and increased production within the region.

2.1.2.2 Competitors

Other Countries:

There is good trade among the countries with the Southeast Asian countries, with exports primarily from Thailand, Indonesia, and Vietnam. China also exports its dry chillies to these countries, though its primary focus is on the more lucrative European market.

Thailand is known for its high pungency Thai Bird's eye chillies, which are consumed both in fresh and dry form. These pose a direct competition to Indian dry chillies, as the primary selling point of Indian dry chillies in Southeast regions is its high pungency.

Other Indian States:

Maharashtra dry chillies are exported only in low quantities to Southeast Asian market. From India, most of the exported dry chillies to Southeast Asian market comes from Andhra Pradesh (60-70%) followed by Telangana and Tamil Nadu (10-15% each).

2.1.2.3 Maintaining Quality Standards and Supply

These markets, though require good quality chilli, are not highly stringent on the quality. Pungency and colour are the main quality characteristics that are demanded by this market.

Variety	Teja is the most preferred variety
Physical Characteristics	Colour – High Red (Bright / Dark) With Stem or Stemless
Pungency	High to Medium Pungency

FPOs targeting to supply to Southeast Asian market should focus on growing high-medium pungency dry chilli varieties. Exports are done throughout the year, primarily from Chennai ports. There is demand for value added dry chilli products, such as red chilli powder and red chilli flakes, in these markets. Among the countries in Southeast Asia, Malaysia is a good market for red chilli powder / flakes.

FPOs can invest in post-harvest infrastructure – drying yards or tarpaulins, solar / electric dryers and packhouse. Solar / electric dryers can give better quality, in terms of cleanliness and retention of colour, compared to sun-drying yards. Sorting, grading, and destemming of chilli is a labor-intensive process and requires labour willing to work in demanding conditions due to the high pungency of dry chillies (especially Teja and similar varieties). FPOs can also invest in cold storage to supply stocks during the second half of the year, when market arrivals in Andhra Pradesh and Telangana are low.

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The Spice Board of India oversees the quality control of dry chilli exports. It has implemented mandatory sampling and testing to check for compliance, as per the importing country. Mandatory sampling circular is provided in the following link - <http://www.indianspices.com/trade/trade-notifications/notificationdetails.html?id=316>. *(The link provides access to the sampling circular for all spices – including dry chilli – that can be downloaded. The document details on country/market-wise requirement on chemicals to be monitored along with the maximum limit of residue. Different limits are applicable for whole chilli, chilli powder, and chilli paste.)*

List of Quality Evaluation Laboratory is provided in the following link - <http://www.indianspices.com/quality-evaluation-laboratory.html>. *(The link provides details on the laboratories available for quality testing of dry chilli, the address and contact details of the laboratories, the main instruments available in each of them, accreditation status. Out of the 8 laboratories listed, 1 is in Maharashtra – Mumbai.)*

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2.1.2.4 Pricing

Export prices are determined by the domestic supply-demand situation, and specifically the market prices in Guntur market. The pricing range for Southeast Asian markets are in the similar range as the Chinese market, since the quality of dry chillies is similar to those that are sent to China. The export price ranges from ₹140-170 per kg during peak arrivals in Andhra Pradesh and Telangana (February to May / June) and ₹180-240 per kg during rest of the season.

Apart from the cost of procurement, the other major costs involved in exporting of dry chillies to Southeast Asian market are sorting, destemming, cold storage (if applicable), transportation and handling, and documentation related expenses. Sorting, grading, and destemming of chilli costs (labour costs) in the range of ₹15-20 per kg in the Nagpur region. Cold Storage costs depends on the supply demand in the region, and it can range between ₹1-4 per kg per year.

2.1.3 Indian Sub-continent

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

2.1.3.1 Characteristics of the Segment

Among the countries in Indian Sub-continent, Sri Lanka and Bangladesh are the biggest importers of Indian dried chillies. Nepal, Maldives, Afghanistan, and Bhutan also import dry chillies from India, albeit in small quantities.

Like India, dry chilli is an important spice in the local cuisines in these countries and has good consumption. The production of dry chillies in the importing countries, except Bhutan, is low in comparison to their consumption. Hence, these countries import large part of their requirement from India.

These countries are low-middle income economies and consumers tend to be highly price sensitive. Hence, the focus during import of dry chillies is more on cost than quality.

2.1.3.2 Competitors

Other Countries:

The primary competition for India among the Indian sub-continent market is the domestic production in these countries. Both Bangladesh and Sri Lanka produce good quantities of dry chillies on their own but are not able to meet their domestic demand through it. Bhutan is nearly self-sufficient in chilli production, and imports only during production shortfalls.

Other States:

Sri Lanka, the top importer in this market, is served by Andhra Pradesh and Tamil Nadu. Both States together supply nearly 99% of India's dry chilli exports to Sri Lanka. Tamil Nadu's main chilli producing districts are in the southern part of the State, which is in close proximity to Sri Lanka through the Tuticorin port, giving it a cost advantage.

Bangladesh is supplied by Andhra Pradesh and Kolkata (West Bengal). Both the States export primarily through the Land ports located in West Bengal. West Bengal, though a minor producer of dry chillies, exports to Bangladesh due to its close proximity to Bangladesh.

2.1.3.3 Maintaining Quality Standards and Supply

The quality demands by the Indian Sub-continent importers are not high, along with non-stringent quality compliance requirements. The requirement is to supply Grade B quality chilli at affordable prices.

Variety	No specific variety
Physical Characteristics	Colour – Medium Red With Stem or Stemless

Pungency

Bangladesh – High pungency
Sri Lanka – Medium pungency

FPOs can invest in post-harvest infrastructure – drying yards or tarpaulins, solar / electric dryers and packhouse. Solar / electric dryers can give better quality, in terms of cleanliness and retention of colour, compared to sun-drying yards. Sorting, grading, and destemming of chilli is a labor-intensive process, and requires labour willing to work in demanding conditions due to the high pungency of dry chillies.

Exports to these markets can be done only by FPOs that are sorting and grading their produce. The price sensitivity of these markets does not make it an ideal market for top grade quality chillies. FPOs should then be able to supply chillies that are a grade lower than those that are being supplied to China and Southeast Asian markets.

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2.1.3.4 Pricing

The Indian Sub-continent markets are highly price sensitive, and the exported Indian dry chillies should compete with locally produced dry chillies. The export price to Bangladesh is the range of ₹80-120 per kg, while for Sri Lanka it is slightly higher in the range of ₹130-150 per kg.

Exporting to these markets might not be feasible for Maharashtra growers due to high logistics involved in comparison to the competing States. Andhra Pradesh due to its large production can send the required quality and quantity of dry chillies to both the markets at competitive prices.

2.1.4 Middle East

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

2.1.4.1 Characteristics of the Segment

The Middle East market has significant Indian diaspora and Indian origin population especially UAE, Iran, Israel, Saudi Arabia, Oman, Qatar, and Kuwait. Hence, this market has good demand for many Indian spices like chilli, cardamom, turmeric, etc. The consumption of Indian horticulture crops and spices is mainly driven by the migrant population from India and its neighboring countries. Value added dry chilli products like powders and pastes are preferred to full dry chillies in these markets.

UAE is the biggest importer of dry chillies from India in the Middle East. Saudi Arabia, Qatar, Kuwait, and Oman import small quantities of dry chilli. In comparison to the exports of dry chillies from India to China or Southeast Asia or Indian Sub-continent, the export to Middle East is less. This is because the consumption is driven by Indian immigrants and not natives.

2.1.4.2 Competitors

Other Countries:

The main competitors of dry chillies for India in Middle East market is Pakistan. Pakistan supplies dry chillies and its value-added products such as chilli powders and paste to the Middle East market. Since there is a large migrant population from Pakistan in the Middle East countries, Pakistan's products could be preferred by that population. Thailand, though exports good quantity of its bird's eye fresh chillies to the Middle East, is a small exporter of dry chillies.

Iran, Jordan, and Egypt are countries in the Middle East that produce dry chillies. Hence, there is internal trade between the Middle East countries for dry chillies. UAE as the trading hub re-exports its dry chilli imports, either directly or after further processing it.

Other Indian States:

Andhra Pradesh, Madhya Pradesh, and Gujarat are Maharashtra’s competitors within India for export of dry chilli to the Middle East. Many States also export processed dry chill products such as chilli powder and chilli paste.

2.1.4.3 Maintaining Quality Standards and Supply

The Middle East market requires top grade chillies and have high quality standards for imports.

Variety	No specific variety
Physical Characteristics	<ul style="list-style-type: none"> • Colour – Medium Red • With Stem or Stemless
Pungency	High and Medium Pungency

FPOs can invest in post-harvest infrastructure – drying yards or tarpaulins, solar / electric dryers and packhouse. Solar / electric dryers can give better quality, in terms of cleanliness and retention of colour, compared to sun-drying yards. Sorting, grading, and destemming of chilli is a labor-intensive process, and requires labour willing to work in demanding conditions due to the high pungency of dry chillies.

Exports to the Middle East market is done throughout the year. FPOs can invest in cold storage to supply stocks during the second half of the year, where market arrivals of dry chillies are low across the country.

Nandurbar is a major producing region of dry chillies in Maharashtra. FPOs in this region can target to export dry chillies to the Middle East market. Since the market accepts medium pungency varieties also, FPOs can leverage the varieties already grown in this region for export. Export to the Middle East markets can be done through Mumbai ports, giving cost advantage over competitors like Madhya Pradesh and Andhra Pradesh.

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2.1.4.4 Pricing

The pricing for exports to UAE is in the lower side ranging around ₹80-100 per kg, while for Qatar it is slightly higher. Pricing range for Saudi Arabia is in the higher range of ₹140-160 per kg. The average pricing for the Saudi Arabian market could be higher since it imports a higher mix of chilli powder and pastes instead of whole dry chillies.

2.1.5 Europe

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

2.1.5.1 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, and spices. The purchasing power of consumers of in this market is significantly higher than other markets such as the Middle East and Indian Sub-continent.

There is an increasing consumption of dried chillies in Europe, with an upward trend in imports year-on-year. Europe is the second largest importer of dried chillies after Asia but before USA. Europe imported

approximately 1,77,000 MT of dried chillies with more than 70% of it from outside Europe¹. Spain is the largest importer of dried chillies in Europe, but they are further processed and re-exported to other European countries. UK, Germany, the Netherlands, France, and Poland are promising markets for consumption of dried chillies.

Major countries that have good opportunity for export of dried chillies are Spain, UK, Germany, the Netherlands, France, and Poland. The European dried chillies import market is dominated by China, except for UK. UK, due to its high Indian immigrant population, imports huge quantities from India. Spain and UK are the major markets in Europe for Indian whole dried chillies. UK also imports significant amount of processed dry chillies.

2.1.5.2 Competitors

Within Europe:

Europe produces less than 33% of its estimated 2,50,000 to 2,60,000 MT requirement of dried chillies. The leading producer of dried chillies within Europe are Romania, Hungary, and Spain. However, these countries have significant domestic consumption, hence trade of dried chillies from these countries to other countries in Europe is limited.

Spain is the world's 3rd largest exporter of dried chillies, but it specializes in re-exports – import of whole dried chillies and export of crushed or grounded dry chillies. Spain is a major competitor of India in the UK market.

China:

China, being the second largest exporters of dried chillies in the world, is a major competitor for India in Europe. China is the biggest exporter of dried chillies to the European market. Spain imports nearly 80% of its dried chillies from China, and Spain accounts for more than 80% of China's exports in Europe.

2.1.5.2.1 Competitive advantage with China for export of dry chilli²

China's low prices at good quality provides it good competitive advantage. Also, Chinese laboratory controls for contaminants are reported to be more reliable compared to those performed by Indian laboratories (particularly for measuring levels of aflatoxins). Furthermore, many Chinese processors have introduced steam sterilization to minimize contamination risks. One of the major producing provinces, Guizhou promotes Chinese chilli production by the organization of the annual International Chilli Expo. Additionally, Chinese companies are successful in international promotion. Most Chinese dried chilli producers actively

¹ <https://www.cbi.eu/market-information/spices-herbs/dried-chillies/market-potential>

² <https://www.cbi.eu/market-information/spices-herbs/dried-chillies/market-potential>

participate in international trade fairs on the national pavilions. Also, lot of them are efficient in terms of delivery (e.g., reaching the import destination within two weeks from signing the contract) or flexible with payment (asking only for partial advance payments).

Other countries:

Peru and Brazil from South America export good quantities of dried chillies to Europe. Peru is known to supply multiple varieties of chillies, as whole dried chillies, that command premium pricing in the European market. Thailand is also emerging as an exporter to Europe, primarily through the Netherlands, exporting crushed or ground chillies.

Other Indian States:

Though India's export of whole dry chillies to Europe is less, major exports from India are from Gujarat, Tamil Nadu, and Maharashtra.

2.1.5.3 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 dried chillies are exported to European markets.

Variety	No specific variety
Physical Characteristics	Colour – Medium Red With Stem or Stemless
Pungency	Medium Pungency

Aflatoxins level is a major concern for export of dry chillies from India to European market. 20% of all shipments of dried chillies must be officially tested for the presence of aflatoxins. Strict Aflatoxin level compliance has discouraged Indian exporters from focusing on the European market.

FPOs targeting to supply to European market should adopt Integrated Pest Management practices to comply with the strict Minimum Residue Level (MRL) levels for the European markets. FPOs should manage the aflatoxin levels by taking measures for muting the microbial activity in chilli pods. This can be done by harvesting without damage, maintaining low moisture levels, controlled drying conditions and avoiding high temperature storage. All these inhibit fungal activity thus helping in maintaining low aflatoxin levels. Adopting steam sterilization, as practiced by many suppliers from China, can keep containment levels in check.

FPOs can invest in post-harvest infrastructure – drying yards or tarpaulins, solar / electric dryers and packhouse. Solar / electric dryers can give better quality, in terms of cleanliness and retention of colour,

compared to sun-drying yards. Sorting, grading, and destemming of chilli is a labor-intensive process and requires labour willing to work in demanding conditions due to the high pungency of dry chillies.

Europe market is witnessing high demand for organic produce. FPOs in Maharashtra can target to supply organic dry chilli, as it not only provides them premium pricing, but also reduces competition faced from other Indian States' and other countries' dry chillies. This would require FPOs to get organic certification that is recognized by Europe markets. APEDA is the recognized authority in India by the European Union to provide / authorize organic certifications. The following link provides the details of companies whose organic certifications European Union recognizes - https://ec.europa.eu/agriculture/ofis_public/pdf/CBListAnnexIV.pdf?uid=6B549E23-D806-9D51-737D6EDF8C777757. *(The document provides the details on the category of products that the agencies provide certification on. There are 6 categories – Unprocessed plant products, Live animals / unprocessed animal products, Unprocessed aquaculture products and algae, Processed agricultural products for use as food, Processed agricultural products for use as feed, and Vegetative propagating material and seeds for cultivation. There are 5 certification agencies in India – Biocert International Private Limited, FairCert Certification Services Private Limited, IMO Control Private Limited, Indocert, and OneCert International Private Limited. The 5 agencies do not provide deal with unprocessed plant products in India).*

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The Spice Board of India oversees the quality control of dry chilli exports. It has implemented mandatory sampling and testing to check for compliance, as per the importing country. Mandatory sampling circular is provided in the following link - <http://www.indianspices.com/trade/trade-notifications/notificationdetails.html?id=316>. *(The link provides access to the sampling circular for all spices – including dry chilli – that can be downloaded. The document details on country/market-wise requirement on chemicals to be monitored along with the maximum limit of residue. Different limits are applicable for whole chilli, chilli powder, and chilli paste.)*

List of Quality Evaluation Laboratory is provided in the following link - <http://www.indianspices.com/quality-evaluation-laboratory.html>. *(The link provides details on the laboratories available for quality testing of dry chilli, the address and contact details of the laboratories, the main instruments available in each of them, accreditation status. Out of the 8 laboratories listed, 1 is in Maharashtra – Mumbai.)*

EU and UK MRLs can be found through the following link - <http://www.indianspices.com/mrls-pesticides.html> . (This link provides further links to MRLs followed in Japan, Europe, CODEX, US, and UK. CODES.)

2.1.5.4 Pricing

European markets pay premium pricing as they require high-quality top-grade chillies. The export price for European market is in the range of ₹140-180 (USD 1.5 to 2) per kg as free-on-board price and is slightly higher than the prevailing domestic market prices of dry chillies. Indian dry chillies should compete with Chinese dry chillies in the European market. China is able to export chillies at low cost of around USD 1.8 to 2.6 per kg as landing price. India should also be able export at similar prices to remain competitive and to increase its market share in Spain imports.

Apart from the cost of procurement, the other major costs involved in exporting of dry chillies to Europe market are sorting, destemming, cold storage (if applicable), transportation and handling, MRL testing, and documentation related expenses. Sorting, grading, and destemming of chilli costs (labour costs) in the range of ₹15-20 per kg. Cold Storage costs depends on the supply demand in the region, and it can range between ₹1-4 per kg per year.

2.1.6 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 spices 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 spices

Export Route	Establishing Connects
Through an exporter from India	<ul style="list-style-type: none"> • Trade fairs (physical and virtual) conduct by Spice Board of India. Details are published on http://www.indianspices.com/trade/bsm.html • 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 Spice Board of India. Details are published on http://www.indianspices.com/trade/bsm.html • 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/ ○ https://www.figlobal.com/india/en/home.html • International events on spice trade are regularly published on the website of CBI – a centre for promotion of imports from developing countries to Europe. www.cbi.eu/events

2.1.7 Advantages and Risks Associated

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 dry chillies from India due to reasons such as repeated non- 	<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

Export Route	Risks / Disadvantages	Advantages
	<p>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</p>	<p>adherence is taken care by FPOs</p>
<p>Through an importer at the importing country</p>	<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 dry 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 Market

Domestic markets consume all grades of dry chilli, as it has a wide range of customer segment from exporters to retailers to processors. Red chilli is primarily traded in the form of dried chillies in Indian markets. 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 amount of dry chilli. Maharashtra is a minor producer of dry chillies in India, unlike green chillies. Dry chilli market is dominated by Andhra Pradesh and Telangana, followed by Madhya Pradesh and Karnataka. Orissa and Tamil Nadu are other States that produce dry chilli more than Maharashtra.

Though dry chilli has specific harvest seasons across India, it can be supplied throughout the year, since it can be stored for long periods.

States	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Andhra Pradesh	Green	Green	Green	Green	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
Telangana	Green	Green	Green	Green	Yellow	Yellow	Yellow	Yellow				
Madhya Pradesh	Green	Yellow	Yellow							Yellow	Green	Green
Karnataka	Green	Green	Green	Yellow	Yellow	Yellow	Yellow				Yellow	Green



The lean season quantity supply in Andhra Pradesh, Telangana, Madhya Pradesh, and Karnataka are significantly greater than the peak supply in Maharashtra.

Andhra Pradesh dry chillies are renowned for their quality, good pungency, and colour. They are primarily cultivated in Guntur and surrounding districts. Khammam region in Telangana is also another district that produces significant quantity of chilli. Both these regions grow varieties such as Teja and Guntur Sannam that are in high demand in domestic markets due to their high pungency.

2.2.3 Maintaining Quality Standards and Supply

Domestic markets accept all grades of dry 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. The grading of dry chilli is based on its colour and pungency. At *mandis*, pungency is generally estimated through seed count in a chilli.

Grade	Colour	Length	Pungency
Grade A	Dark Red to Red	6 cm and above	High to Medium
Grade B	Red	4-6 cm	High to Medium
Grade C	Pale Red	<4 cm	Medium to Low

Currently, the process of drying, sorting, and packaging of chillies is done by Traders. These activities can be done by FPOs to fetch higher prices for their produce, and also to get quality commensurate pricing. Drying is a major value addition that FPOs can undertake, either through open-air drying or through usage of solar / electric dryers. Bringing down the moisture level to less than 12% along with retaining the colour of the chillies can fetch FPOs good prices in the market. To carry out these activities, FPOs can invest in infrastructure through packhouse and drying yard or tarpaulins or solar / electric dryers.

Grade-wise sales (sorted) of dry 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.

Cold storage for dried chillies is not mandatory in case of storing for short term (few weeks). In case they are to be stored for long duration, then cold storage is recommended to preserve its quality.

Maharashtra is a net consumer of dry chilli since there is less production and high consumption. So, dry chillies produced in Maharashtra are usually consumed within the State, while some quantity is sent to Gujarat and Rajasthan markets. The requirement of select markets outside the State, where dry chillies from Maharashtra is sold, is given below.

Markets	Quality	Varietal Preferences
Ahmedabad, Surat (Gujarat)	Grade A – High Pungency	VNR, Laali
Jodhpur, Bhilwara, Jaipur (Rajasthan)	Super A & B – Medium Pungency	Laali, 5531
Indore, Khargone (Madhya Pradesh)	Super A – High Pungency	Teja

FPOs intending to send their produce to major domestic markets such as Delhi, Lucknow, Kanpur, Patna, Hyderabad, and Bangalore should cultivate varieties that are demanded in these markets. Teja, Guntur Sannam, Byadgi, and Wonderhot chilli varieties have appeal across different major markets in India.

FPOs in Nagpur region can focus on growing Bhiwapur chilli variety, as there is significant local demand in that region. Low production and high demand have also increased the market prices of Bhiwapur chilli, which FPOs can leverage.

Since Maharashtra is a major producer of green chilli, there is a practice to harvest red chilli from green chilli variety plants. This is primarily done to overcome the price crashes during peak green chilli harvest season. These varieties do not yield good quality dry chillies, and hence will not be given good prices in domestic markets.

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 price for top grade produce. However, practice of buying graded dry chillies is not prevalent in all markets as grading and sorting is done by the commission agents or traders, and further supplied to different channels.

Dry chilli prices in India are heavily influenced by the market arrivals in Andhra Pradesh and Telangana, and the quantity of exports. Maharashtra market prices are influenced by the arrivals from major producing States apart from the local production. The average pricing of different grades of chilli in key dry chilli production markets is provided in the table below.

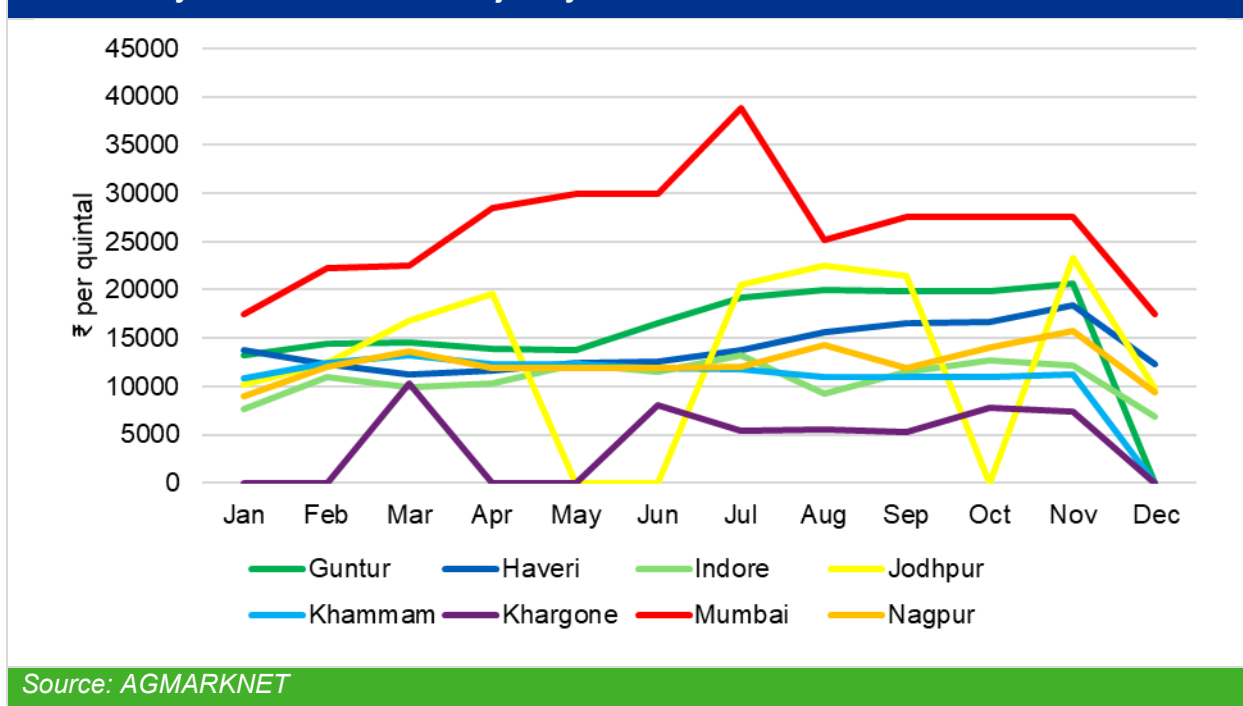
Grade	Price range
Grade A	₹140 to 200 per kg
Grade B	₹110 to 130 per kg
Grade C	₹80 to 110 per kg

For supplying to other domestic markets in the country, it is necessary to understand the pricing trends during that week in those markets. Supplying to markets outside the State need not always necessarily fetch better prices for the FPO. Costs related to transportation should also be accounted. Dry chilli pricing is significantly dependent on the variety, and hence FPOs cannot be assured of a good price in different markets only based on quality of their produce.

www.agmarket.gov.in is the Government portal that provides information on the maximum price, minimum price, and modal price of dry chilli at all markets in a particular day / week / month where dry chilli is being traded. FPOs can use the portal to understand the pricing trend before sending their produce to distant *mandis*. Transportation cost of ₹3-5 per kg for Gujarat, Madhya Pradesh, ₹5-7 per kg for Rajasthan, Delhi, and Uttar Pradesh markets, and additional ₹3-5 per kg for market further north and Eastern markets, should be considered by the FPOs before deciding on choosing the market to send their produce.

The below chart provides modal price comparison between major dry chilli markets in Maharashtra, and major dry chilli markets in India. Distant markets or markets in major cities may not necessarily provide higher prices than the regional *mandis*.

Table 18: Dry Chilli Modal Price in major dry chilli markets in Maharashtra and India – 2021-2022



Source: AGMARKNET

Domestic markets prefer 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, can sell through other channels that require specific quality of dry 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. Establishing connects can be done through visits to the *mandis* to meet Commission Agents and build business. It can also be done by seeking help from other FPOs or traders dealing in dry chilli in surrounding geography.

Agriculture / horticulture commodities focused marketplace platforms are effective tool for FPOs to find buyers across the country. Trading option for dry 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 dry 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 channels for horticulture and spice crops. Organized retail includes large national retail players like Reliance, More, and DMart, and other regional retail companies. Major eCommerce companies dealing in horticulture and spice 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 consumers. Hence, there is significant focus on quality of the produce. The companies in this market segment usually procure from *Mandis* and from traders / village-level aggregators. Over the recent years, there has been considerable focus of these companies on procuring directly from farmers / FPOs by establishing collection centers to reduce costs and have more control over quality. Many companies have also established collection centers in major producing regions for procurement.

2.3.2 Competitors

FPOs looking to supply to 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 dry producing States, such as Andhra Pradesh, Telangana, Karnataka, and Madhya Pradesh are also competitors to Maharashtra FPOs looking to supply to Organized Retail and eCommerce segment.

Since dry chillies can be stored for a long time, and market arrivals are across in the year in Andhra Pradesh and Telangana, Maharashtra FPOs may not get seasonal advantage that is common with other fresh produce such as green chillies.

2.3.3 Maintaining Quality Standards and Supply

Organized retail and eCommerce market players generally require high quality (top grade) produce. The key to supply in this segment is to grow varieties that are provide good colour and pungency, which is the requirement of the consumers. Very high pungency is not preferred in this market.

Colour	Dark Red to Red
Length	>6 cm

Pungency	Medium Pungency
Criteria for Rejection	High % of broken, high % of loose seeds, high moisture content, low pungency, pest infested, high % foreign matter, pale colour

It is necessary that clean and dried red chillies with moisture content <12% is supplied to these market players. FPOs should invest in drying yards or tarpaulins or solar / electric dryers to process the fresh red chillies to dry chillies. Solar / electric dryers would lead to better output as it can retain flavor and colour better along with keeping the produce clean.

In Organized Retail and eCommerce, dry chillies are generally sold in small packs and not in loose. In case of market player demand, FPOs should be able to pack dry chillies in small packs (100 g to 1000 g). FPOs can also invest in small-scale vacuum packaging technology, as it is better in retaining the flavor of chillies. Though vacuum-packed chilli is still a small market, it would increase the interest from this segment to procure from the FPO.

FPOs can also do further value addition of stem removal as per the market player requirement. Dry chillies sold through these market players to final consumers are both with stem and stemless.

2.3.4 Pricing

The pricing for this segment market players is dependent on the prevalent domestic market prices. Since they procure from different States to meet their demand, they can easily offset price increase in one market from procuring from another market. Additionally, since there is strong consumer demand for dry chillies from Andhra Pradesh, it can reduce the bargaining power of Maharashtra FPOs.

Entering into seasonal contracts with market players in this segment is a win-win situation for both the parties. FPOs can supply at a reasonable and assured price, while the market players are guaranteed of required quality and quantity. Pricing is decided on mutual agreement based on last season(s) markets' price trends.

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 can procure dry chillies from Nandurbar 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 can cultivate good varieties of red chillies and dry it properly can get good value through this segment. 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 season contracts with these market players and sell at profitable prices at reduced risk. Payment default risk is lower with these market players.

These market players function on credit terms, though credit terms can be as short as 3 days to 30 days. Rejections and price cuts due to quality issues can be common occurrence as they can have strict quality norms. Since these market players procure from different chilli production regions and numerous buyers, the pricing power with FPOs is low during negotiations.

2.4 Processors

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

2.4.1 Characteristics of the Segment

Processors are a large market for dry chillies, since dry chilli is widely consumed in the form of powder and flakes. Share of crushed / powdered dry chilli is 25-30% in the export market and that of flakes is around 5%. There are many industrial scale processors in India such as ITC Limited, VLC spices, Everest Spice, etc. that have major consumer facing brands in India and across the world, and also export the processed dry chillies. Companies such as AVT McCormick Ingredients Pvt Ltd., Swani Spice Mills Pvt Ltd., and ITC Limited buy some quantities of dry chilli from Maharashtra. Companies like Synthite Chemicals also extract and export oleoresins from dry chillies. Processing of dry chilli is also done by small-scale companies that have regional brands, and supply in a specified geography. Competition

For an FPO looking to supply to processors its competitors are all major chilli markets across the country. Since industrial processors procure in large quantities throughout the year, they have procurement centers across major dry chilli producing regions. The processors also tend to have long-standing relationship with select suppliers, as the suppliers understand their requirements.

Processors procure majorly from Andhra Pradesh, Telangana, and Karnataka since they produce chillies of varieties that provide the right colour and pungency. Processors procure from Maharashtra in small quantities from Vidarbha and Marathwada region.

2.4.2 Maintaining Quality Standards and Supply

Unlike processing of other fresh produce, where processors buy lower grade produce, dry chilli processors buy a mix of quality and variety. Varietal mix is to ensure that the resultant powder is of the required colour and pungency. Chemical properties are the primary quality specifications for dry chilli processors.

Varietal Preferences	Teja, Guntur Sannam, Byadgi, Kashmiri
Pungency	Pungency of different levels are accepted as per the final product requirement Scoville Heat Units (SHU) from 10,000 are accepted
Colour	Dark Red / Bright Red – minimum 60 ASTA
Moisture	10-12% maximum
Criteria for Rejection	Pale red colour, very low pungency, infestation

Some processors intending to export the processed products would have additional requirements to comply with the requirements of the importing country such as Aflatoxins level and microbiological standards.

FPOs can target to supply their produce to regional processing units, as they can supply in a cost-effective manner. Targeting to supply to processors in multiple States may not be possible due to low production and high logistics costs. The demanded varieties are not cultivated in large scale in Maharashtra, thus FPOs that can supply such varieties shall be at an advantage. Processors would prefer to procure regionally as it reduces their logistics cost.

2.4.3 Pricing

Dry chilli processors' purchase price is as per the prevailing market prices. Since they buy in bulk and in a mix of qualities and varieties, the purchase price can be slightly lower than the market prices. Market prices are compared across multiple dry chilli markets across the country.

2.4.4 Establishing Connects

FPOs can supply dry 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

2.4.5 Advantages and Risks Associated

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

Industrial processors buy in large quantities and FPOs might send significant amount of their produce to few processors. Though this might provide FPOs with a large business opportunity, this increases the risk of over dependence on single / handful of market players.