



Indo-German Cooperation on Agricultural Market Development

Building sustainable partnerships

Tomato (*Solanum lycopersicum*)



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on behalf of the German project implementation consortium of



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Global Trade – India’s Role

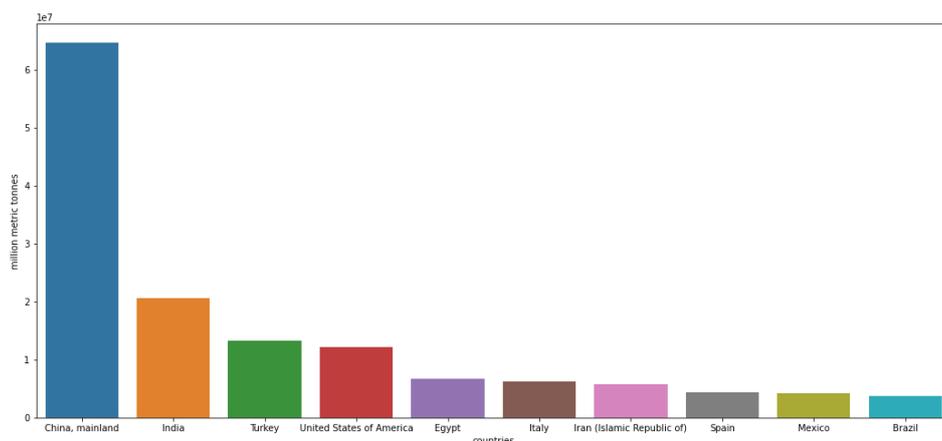


Figure 1. Major tomato producing countries in 2020 (FAOSTAT 2021)

- In 2020, China was the world’s largest tomato producing country contributing more than 34% of total world production with a volume of 62.8 million metric tonnes (FAOSTAT 2021, Tridge 2021).
- India was the second-largest tomato producing country with a production share of 10.5% and production of 20.5 million metric tonnes.
- Mexico was the leading tomato exporter with a global share of 26.12% (US\$ 2.6 billion), while the USA was the leading tomato importer with a share of 30.62% (US\$ 2.9 billion) in 2020.

Table 1. Top five global tomato exporters in 2020 (Tridge 2021)

Country	Export Share 2020 (%)	Export Value in 2020 (US\$ billion)	Export Growth Value from 2017-20 (%)
Mexico	26.12	2.61	+30.6
Netherlands	19.23	1.92	-1.80
Spain	10.72	1.07	-6.13
Morocco	9.25	0.92	+45.37
Canada	4.61	0.45	+10.79

Table 2. Top five global tomato importers in 2020 (Tridge 2021)

Country	Import Share in 2020 (%)	Import Value In 2020 (US\$ million)	Export Growth value 2019-20 (%)
USA	30.62	2.92 billion	+28.32
Germany	16.42	1.56 billion	+4.9
France	7.56	720.54	+2.34
UK	6.68	636.48	-5.26
Russia	4.36	415.60	-20.68

- In 2020, India’s tomato global export value was US\$ 35.6 million. From 2017 to 2020, growth in export value declined by -46.8%.
- South Asian and Middle Eastern countries are leading importers of Indian tomatoes, such as Bangladesh with a share of 47.2%, UAE with 26.2%, Nepal with 10.7% and others. India’s major tomato export trade with UAE has declined by -42%.
- In 2020, India’s tomato imports were not that significant, with an import value of US\$ 85.8 thousand. From 2015 to 2020, tomatoes’ growth in import value declined 88%. The Netherlands share 83.6% of the total value of tomato imports to India, followed by Egypt with 14.3%, Brazil with 2.2% and others.

Fresh Tomato Exports from India

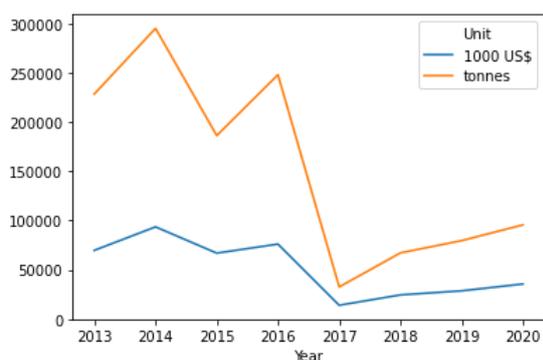


Figure 2. Indian tomato export trends from 2013 to 2020 (FAOSTAT 2021)

Table 3. Indian tomato importing countries (Tridge 2021)

Partner	import Share in 2020 (%)	Import Value In 2020 (US\$ million)	Import Growth value 2019-20 (%)
Bangladesh	47.21	16.79	-
UAE	26.25	9.3	-4.61
Nepal	10.72	3.81	+260.46
Qatar	6.16	2.19	+67.08
Oman	5.12	1.82	+119.05

- India accounts for about 2% of global tomato exports, occupying the 13th position in the world, and it is a net exporter of processed tomatoes.
- India’s minimal presence in the tomato paste export market can be attributed to higher input costsⁱⁱ.

Tomato Pulp Exports from India

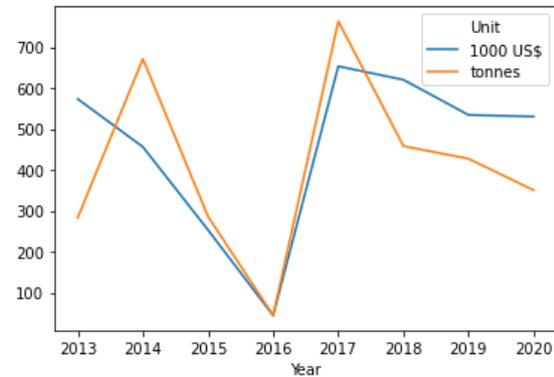


Figure 3. Tomato pulp export trends from India (FAOSTAT 2021)

Peeled Tomato’s Exports from India

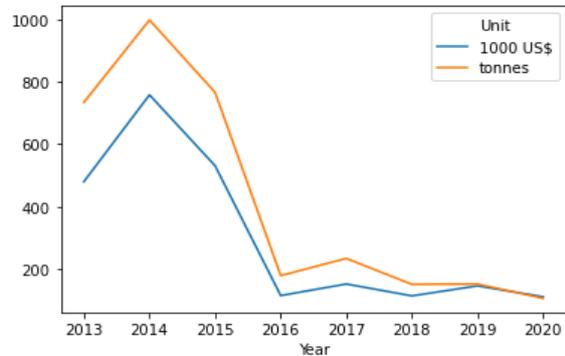


Figure 4. Peeled tomato export trends from India (FAOSTAT 2021)

Tomato Market Trends in European Union

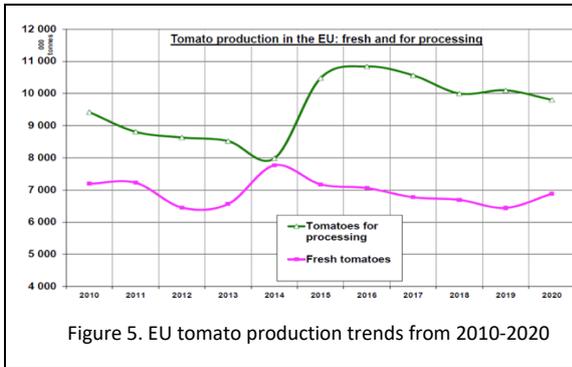


Figure 5. EU tomato production trends from 2010-2020

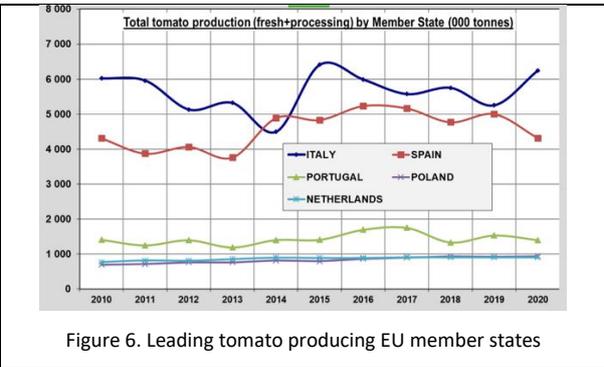


Figure 6. Leading tomato producing EU member states

- Italy and Spain are leading tomato producing states in the EU.
- In the last 10 years, Morocco has been the leading tomato supplier to the EU (see Figure 7), from 2015 to 2020, the volume of tomato EU imports from Morocco has increased by 18%.
- Turkey has been the second-largest tomato exporter from 2015 to 2020, the volume of tomato EU imports from Turkey has increased by 49%, followed by Albania.
- The average EU imports of tomatoes are much higher in the winter months from October to March.

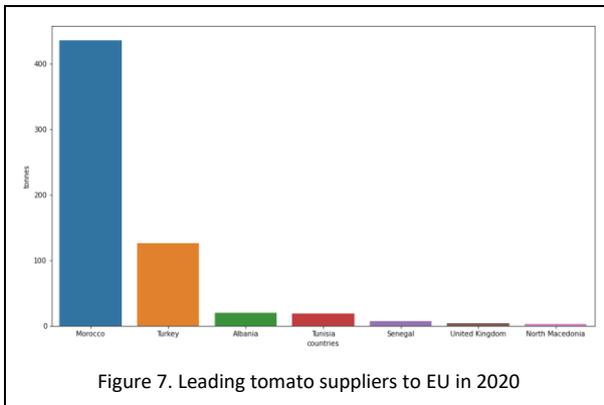


Figure 7. Leading tomato suppliers to EU in 2020

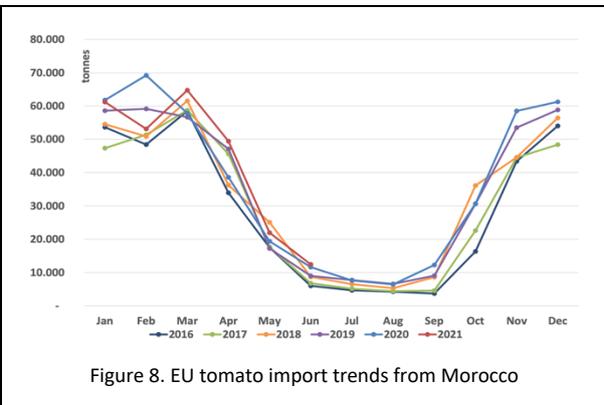
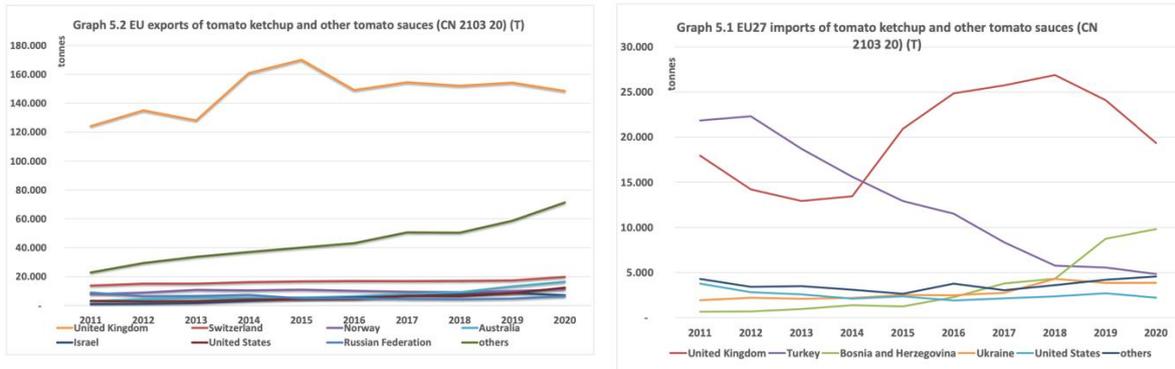
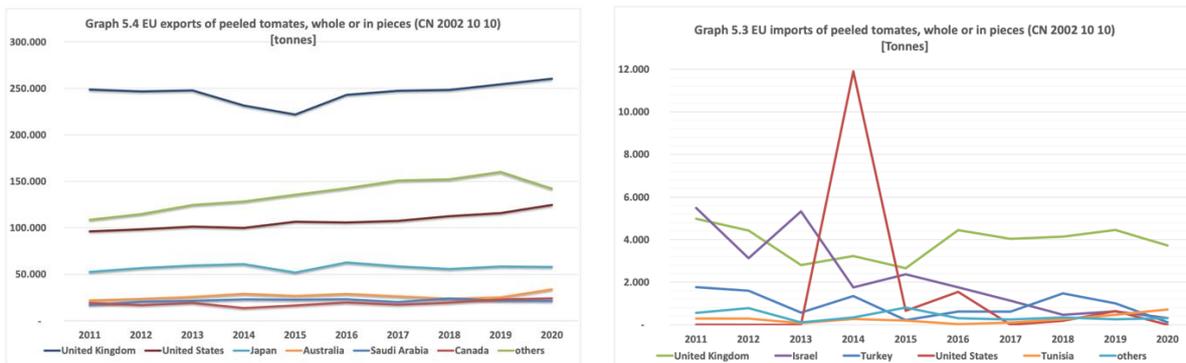


Figure 8. EU tomato import trends from Morocco

EU ketchup and other tomato sauces trade



EU peeled tomatoes trade



Market segmentation

- At present, around 80% of the tomatoes produced around the world are freshly consumed, whereas the remaining 20% are employed in the tomato processing industry for preparing purees, soups, tomato ketchup, sauces and othersⁱⁱⁱ.
- Figure 9 displays the fresh tomato monthly wise wholesale price fluctuation based on production, demand and supply in the EU.

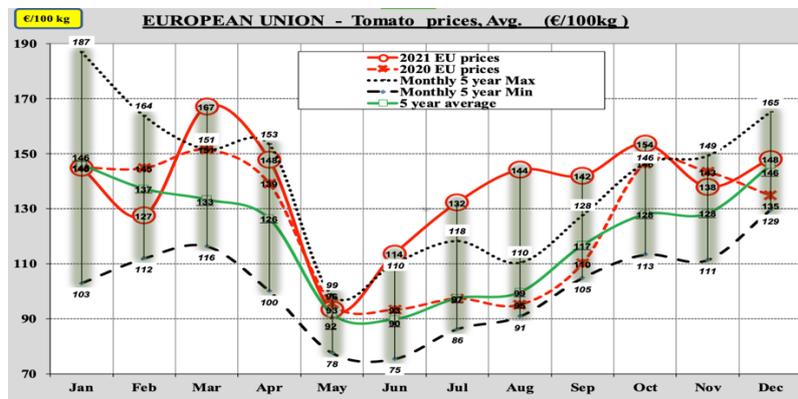


Figure 9. EU - tomato average wholesale price/ 100kg^{iv}

- The consumer price of fresh tomatoes in the retail sector varies between 1.5 to 2.5 € per kilogram.

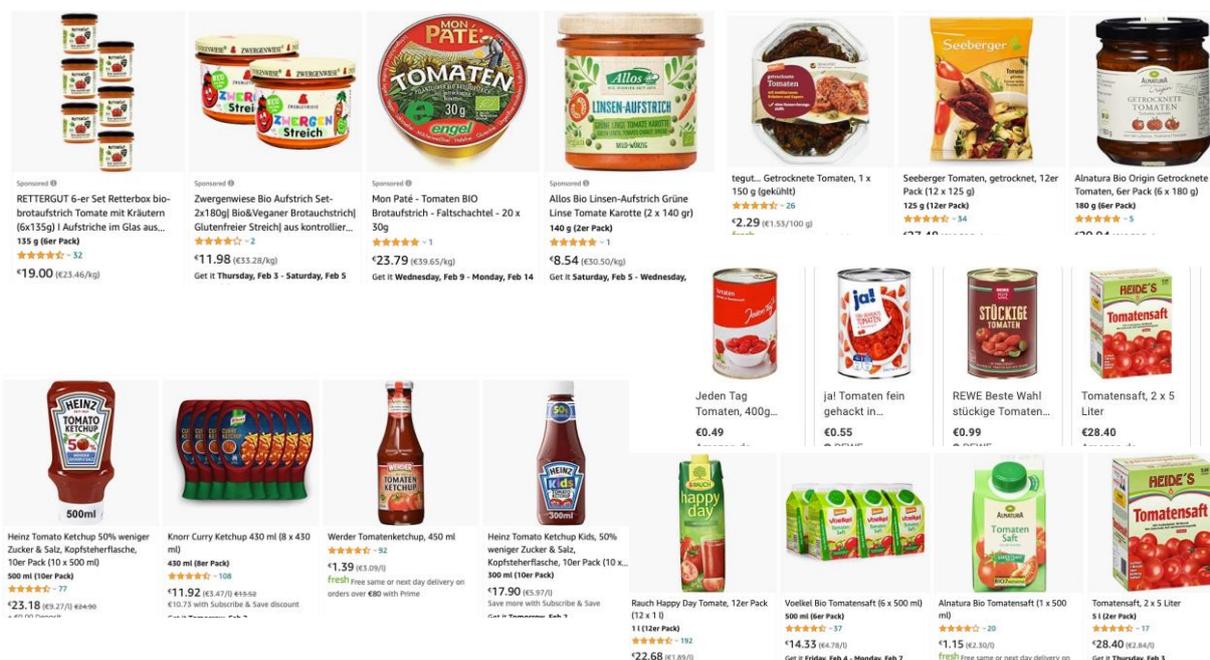


Figure 10. Consumer prices of various tomato centric products in the German retail sector

EU Regulatory Requirements

Exporting fresh fruits and vegetables to Europe requires to keep high standards of food safety and quality:

<p>Pesticides Residues</p>	<p>European Union (EU) has set maximum residue levels (MRLs) for pesticides in and on food products. Products containing more pesticides than allowed will be withdrawn from the European market. MRLs can become stricter with new insights from Europe’s food safety authorities. Member States such as the United Kingdom, Germany, the Netherlands and Austria use MRLs which are stricter than the MRLs laid down in European legislation. Supermarket chains maintain the highest standards and generally demand 33% to 100% of the legal MRL.</p> <ul style="list-style-type: none"> • The German discounter Lidl is one of the strictest, with a limit of 33% of the EU legal standard for single active substances. • For importers, it is the easiest to work with the highest (Lidl) standard to maintain flexibility. Supermarkets tend to follow their competitors, and several of them may still tighten their requirements. Some of the supermarket chains impose financial penalties when a violation of their limit is detected. <p>Maximum level of lead: 0.10 mg/kg wet weight Maximum level of cadmium: 0.050 mg/kg wet weight <i>*Read more about contaminants on the website of the European Commission and find an overview of the maximum contaminant levels in the Annex of Regulation (EC) 1881/2006¹. Try to check this information on an annual basis.</i></p>
<p>Microbiological contaminants</p>	<p>When supplying pre-cut fruit and vegetables, you must take into account microbiological hazards such as Salmonella and E. coli. Salmonella must be absent throughout the shelf life of a freshly cut product. E.coli should be practically absent during the manufacturing process. <i>* European Regulation (EC) No 2073/2005² will provide you with information about testing methods, sampling plans and measuring limits.</i></p>
<p>Plant health and phytosanitary regulations</p>	<p>Most fresh fruit and vegetables are subject to health inspections and require phytosanitary certificates prior to shipping. This group includes leafy vegetables, tomatoes, peppers, citrus fruit, stone fruit, berry fruit, apples, pears, mangoes and avocados, among many other fruits. You can find these products and their Latin names in Annex V, Part B of the updated European Plant Health Directive 2000/29/EC (September 2019). Fresh fruits that do not require a phytosanitary certificate are pineapple, banana, coconut, durian and dates.</p>

¹ <https://eur-lex.europa.eu/eli/reg/2006/1881/2018-03-19>

² <https://eur-lex.europa.eu/eli/reg/2005/2073/2019-02-28>

What additional requirements do buyers often have?

European buyers often have specific requirements, depending on their sales channels and product segments. Common buyer requirements include GLOBALG.A.P. certification, and compliance with social and environmental standards.

Tomato Production in India

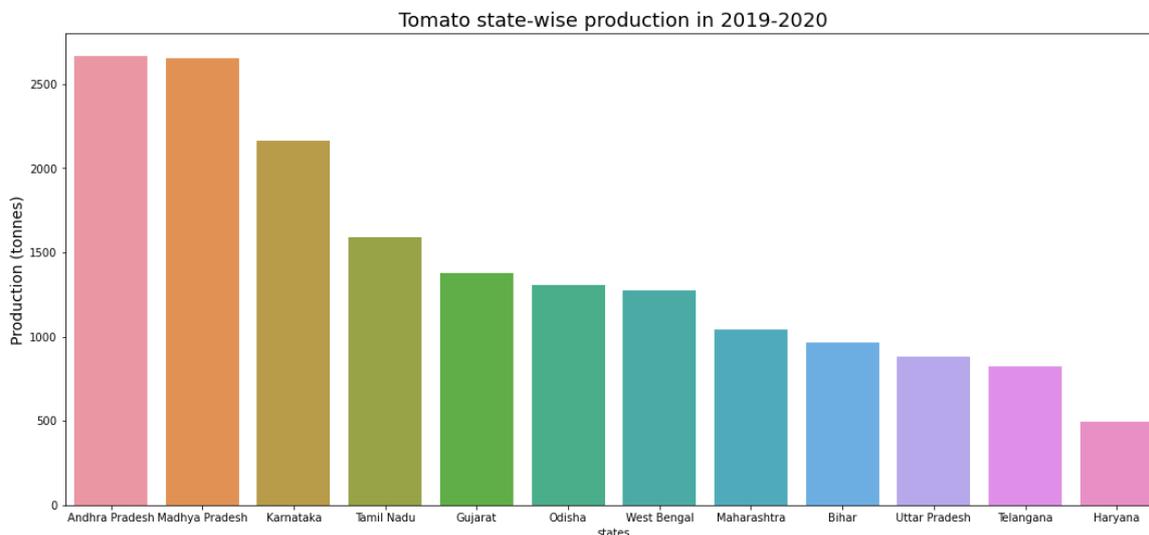


Figure 11. Leading tomato producing states in 2020

- The major Tomato producing states in India are Andhra Pradesh, Madhya Pradesh, Karnataka, Gujarat, Odisha, West Bengal, Tamil Nadu, Bihar, Maharashtra, Uttar Pradesh, Haryana and Telangana. These states account for about 90% of the total production of the country.
- Andhra Pradesh, which produces more tomatoes than any other state with a 13% share, is also one of the main hubs for tomato paste and pulp production in India.
- Key tomato growing districts in Karnataka are principally Kolar (28%) as well as Belgaum, Haveri and Mandaya districts each having a share of between 8-10%.
- In Maharashtra, production is largely centred around Nasik, which generates some 35% of all tomatoes produced in the state.
- The compound annual growth rates (CAGR) of area, production and productivity of tomato in India during 2009-10 to 2018-19 shows that the area under tomato has increased at the growth rate of 0.95%. Similarly, production and productivity have positively and significantly increased with a CAGR of 3.33% and 2.36% respectively.
- Indian horticultural research institutions and private companies developed several tomato hybrids such as *Vishali*, *Pusa Ruby*, *IHR*, *Ayushman*, *US440* and *Lakshmi* (varieties and their characteristics follow the National Horticulture Board Report^{v)}
- In 2018, India exported US\$ 25.22 million worth of tomato seeds, which constitutes 61% of the total vegetable seed export. The Netherlands was the largest importer with a value of US\$ 11.19 million^{vi}.

SEASON	TRANSPLANTING	HARVESTING PERIOD	PRODUCTION	
			2018-19 (Final)	2019-20 (2 nd Ad. Est.)
Kharif	May – July	July - November	51.04	49.62
Rabi	October – February	December - June	139.03	154.86
TOTAL			190.07	205.72

Figure 12. Seasonality of tomato cultivation^{vii}

Year	Area(ha)	Production(Mt)	Productivity
2009 -10	6,34,400	1,24,33,100	19.60
2010 -11	8,65,000	1,68,26,450	19.45
2011 -12	9,07,100	1,86,53,290	20.56
2012 -13	8,79,600	1,82,26,610	20.72
2013 -14	8,82,000	1,87,35,910	21.24
2014 -15	7,67,300	1,63,84,970	21.35
2015 -16	7,73,900	1,87,31,970	24.20
2016 -17	7,97,000	2,06,93,170	25.96
2017 -18	9,78,000	1,97,45,490	20.19
2018 -19	7,81,000	1,90,07,000	24.34
CAGR	0.95	3.33**	2.36**

Note: ***& ** significance at 1% and 5% level, respectively.

Figure 13. Tomato production and productivity trends

- In 2021, wholesale prices of tomatoes came down to as low as INR 4 per kilogram in various states. According to government data, the prices were down by 50 per cent from the same period last year. Unable to sell, farmers in Maharashtra (Aurangabad and Nashik districts) dumped tomato produce on the highways^{viii}.
- In 2017, the months of June to December recorded the highest average wholesale prices of INR 4000 per 100 kg at APMC markets.
- In 2016-17, the demand for tomato puree and ketchup increased by 40% due to surging fresh tomato consumer prices INR 80-100^{ix}.

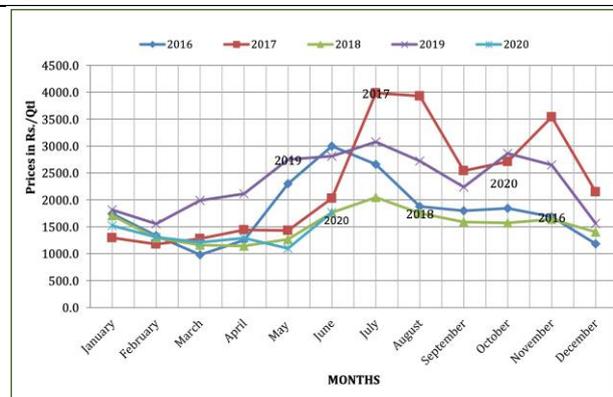


Figure 14. Average tomato prices at APMC markets in India



Figure 15. Typical example of high production vs market failure

- India's annual ketchup consumption is estimated at 13,000 tonnes with a market value of INR 1.8 billion (US\$ 28 million). Nestlé's Maggi dominates the ketchup market with a 37% market share, followed by Unilever's Kissan (29%) and Heinz (10%).

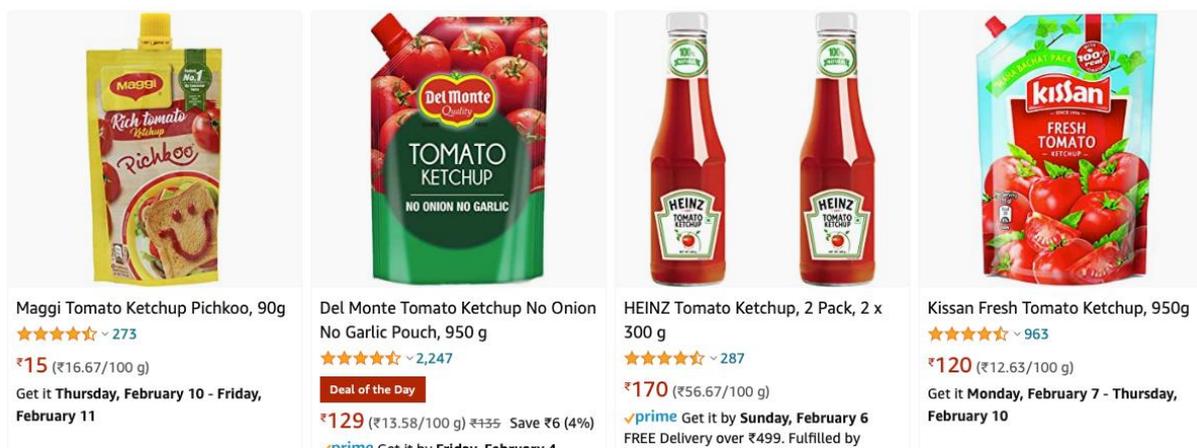


Figure 16. Tomato centric products in the retail sector

Tomato Promotional Schemes in India

Operation Greens:

The scheme will have a two-pronged strategy of Price stabilisation measures (for the short term) and Integrated value chain development projects (for the long term).

Short term Price Stabilisation Measures

NAFED will be the Nodal Agency to implement price stabilisation measures. MoFPI will provide 50% of the subsidy on the following two components:

- i. Transportation of Tomato Onion Potato. (TOP) Crops from production to storage.
- ii. Hiring of appropriate storage facilities for TOP Crops.

Market Intelligence and Early Warning System

MIEWS Dashboard and Portal is a platform for monitoring prices of tomato, onion and potato (TOP) and for generating alerts for intervention under the terms of the Operation Greens scheme. The portal would disseminate all relevant information related to TOP crops such as Prices and Arrivals, Area, Yield and Production, Imports and Exports, Crop Calendars, Crop Agronomy, etc in an easy-to-use visual format.

Long Term Integrated value chain development projects

- i. Formation and Capacity Building of FPOs
- ii. Quality Production
- iii. Post-harvest processing facilities - At Farm Level
- iv. Post-harvest processing facilities - At Main Processing Site
- v. Agri-Logistics
- vi. Marketing/Consumption Points

Green Innovation Centre India: Adapting Green Innovation Centres to climate change. Analysis of value chain adaptation potential: tomato, potato and apple value chains in Himachal Pradesh, Karnataka, Maharashtra and Andhra Pradesh, India. GIZ (German Development Agency) is implementing this project to -enhance the production, productivity and profitability of farmers across the tomato value chain through promotion and strengthening of Farmer Producer Organisations with special focus on women and youth in Chittoor district of Andhra Pradesh together with the local NGO APMAS.

Scheme for Agro-Marine Processing and Development of Agro-Processing Clusters: Scheme for Agro-Marine Processing and Development of Agro-Processing Clusters Government of India's SAMAPDA Yojana provides a subsidy for setting up of food processing industry and has boosted the food processing sector. Renamed as Pradhan Mantri Kisan SAMPADA Yojana, with an allocation of INR 60 billion for 2016 to 2020, the scheme provides a subsidy of 35% of the project cost up to INR 5 crores for setting up of food processing units. This scheme will not only help in setting up food processing units but will also include food parks, integrated cold chains, creation of backward and forward linkages, food safety and quality and other infrastructures. (MoFPI 2018).

Maharashtra's Agri-business and Rural Transformation Program: The government of Maharashtra tied up with World Bank for US\$300 million project, known as Maharashtra's Agri-business and Rural Transformation Program (SMART) Project. The project aimed to develop inclusive and competitive agriculture value chains, focusing on smallholders and agri- entrepreneurs in Maharashtra with active participation from the private sector. The scheme includes several agricultural commodities.

APEDA: Agricultural & Processed Food Products Export Development Authority (APEDA), under the Infrastructure Development component of its export promotion scheme, provides financial assistance for the purchase of insulated/reefer transport/mobile pre-cooling units up to 40% of the cost subject to a ceiling of INR 100 lakhs. Assistance is available for the establishment of post-harvest infrastructure for fresh horticulture produce like integrated packhouse, purchase of insulated and, reefer transport/mobile pre-cooling units.

Rashtriya Krishi Vikas Yojana (RKVY): Assists fruit processors with soft loans to upgrade technology at the plants.

Mega Food Park Scheme: Provides financial assistance through the Ministry of Food Processing Industries (MoFPI), to establish mega food parks to link production areas to markets with processing facilities, support infrastructure and improve value addition, minimizing wastage, increasing farmers' income and creating employment opportunities, particularly in the rural sector.

Credit Linked Capital Subsidy Scheme (CLCSS): The Ministry of Micro, Small and Medium Enterprises, has extended support by promoting small-scale industries and technology by providing a subsidy of up to USD 22 000 to upgrade plant machinery. Implementation of the Total Quality Management System including ISO 9000, ISO 22000, HACCP, GMP and GHP through the MoFPI assists in expansion by reimbursing up to 50 percent of expenditure for consultant fees charged to processing units by the Certification Agency, for plant and machinery, technical civil works and other expenditure covering implementation of the Total Quality Management System including ISO 9000, ISO 22000, HACCP, GMP and GHP.

What are significant challenges in the tomato supply chain?

Production constraints:

- Lack of quality germplasm for fresh and processing markets. A key constraint to production is the lack of improved cultivars particularly those suited for processing. Tomato varieties in India have been bred mainly for the fresh market. The introduction of high-yielding varieties including open pollinated varieties suitable for processing is required to address this.
- Biotic and abiotic challenges to productivity: tomato yellow leaf curl viruses, nematodes, heat and drought stress.
- Most farmers have little exposure or training on good agricultural practices and typically adopt production methods that they see their peer farmers practicing in their neighbourhood. Thus, many farmers implement improper crop management decisions particularly with respect to crop disease risk and management.
- The lack of horticulture extension services or the inability of the government extension system to respond effectively to farmers with advice and support is another factor contributing to poor crop production practices.
- Lack of cold storages lead to substantial post-harvest losses.

Marketing constrains:

- High price fluctuation. Tomato farmers sell their produce usually through a local aggregator or via a trader at the local or regional *mandi*. Farmers realize an estimated 30-50% of total value through the supply chain with the remainder being distributed amongst a multiplicity of traders and commission agents. This low margin on total value makes production unviable during the glut periods when tomato prices can fall to between INR 0.50 to 2 per kilogram^x.
- Farmers and middlemen have a preference to sell to urban markets rather than to sell to processors. As a result, several tomato paste makers have indicated a slippage of 10-20% in production which farmers seek to sell on the open market when market rates are more attractive than the contracted rates.

Processing constrains:

- The use of unsuitable tomato varieties for processing has serious financial implications for processors as they have to use more fresh tomato per unit of paste produced. This impacts on processing production costs and lowers the procurement price offered by processors to farmers.
- Product perishability is a significant quality factor for processors. Tomatoes are highly perishable, and transportation and storage can result in physical losses of as high as 25-30%, and these also compromise processed paste quality.

ⁱ https://www.fao.org/faostat/en/#rankings/countries_by_commodity

ⁱⁱ <https://library.oapen.org/bitstream/handle/20.500.12657/52430/978-981-33-4268-2.pdf?sequence=1#page=62>

ⁱⁱⁱ <https://www.imarcgroup.com/tomato-processing-plant>

^{iv} https://ec.europa.eu/info/sites/default/files/food-farming-fisheries/farming/documents/tomato-dashboard_en.pdf

^v <http://nhb.gov.in/pdf/vegetable/tomato/tom013.pdf>

^{vi} https://agriexchange.apeda.gov.in/Weekly_eReport/Vegetable_Seeds_Report.pdf

^{vii} [https://agricoop.gov.in/sites/default/files/Monthly%20Report%20on%20Tomato%20for%20June%2C%202020.p](https://agricoop.gov.in/sites/default/files/Monthly%20Report%20on%20Tomato%20for%20June%2C%202020.pdf)

^{viii} https://www.news9live.com/india/tomato-prices-crash-production-glut-explained-way-forward-120274?infinite_scroll=1

^{ix} https://avrdc.org/download/publications/technical-reports/reports/GIZ_India-Processed-Tomato-Study_16Sept2016.pdf

^x https://avrdc.org/download/publications/technical-reports/reports/GIZ_India-Processed-Tomato-Study_16Sept2016.pdf