

ONION

STAPLE INGREDIENT



VTPC
KARNATAKA

Visvesvaraya Trade Promotion Centre (VTPC)

VTPC Building, Kasturba Road, Bengaluru-560001.

Preface

With a robust agro potential the Country has, the Government of India has launched the One District One Focus Product Scheme (ODOFP) for agriculture sector by the Ministry of Food Processing Industries. Among its primary objectives, the ODOFP initiative aims to enhance the value of the products which is eventually expected to boost employment and income levels of the farmers. The identified products across the country is available at <https://www.nfsm.gov.in/odopstatecropsreport.aspx>

Karnataka has identified its product mix with high demand and export potential across all the districts. The implementing agency for this initiative is the Karnataka State Agricultural Produce Processing and Export Corporation Limited (KAPPEC), the nodal agency in the State.

VTTC being the nodal agency for promotion of exports from the State has made an attempt to draw the action plan district wise, to capture the potential, present status and future prospects in domestic and international markets. Besides, detailed insights have been provided into the biological description of the product, their local, national and international varieties, export-import analysis, HS codes. For a holistic perspective for those concerned, each report also provides SPS standards, processing technologies available, export grading and packing specifications, and suggested pivotal roles and responsibilities among the government departments, boards, corporations and Universities.

Presenting the Action Plan/Report for Onions, a ODOFP product mapped to Bagalakote district of Karnataka, formulated by VTTC. I sincerely hope that this ready reckoner with first-hand information regarding the farming sector would help all those concerned, especially the FPOs and food processing entrepreneurs who have a desire to focus on exporting this product.

S.R. Satheesha

Director (Exports) & Managing Director

Contents

Page no.

Description

Introduction	1
Popular Onion varieties across the World	2
Varieties of commercially grown onions in India	5
GI tagged onions of India	6
Top 10 Exporting & Importing countries of the World	7
Production data of Onions	8
World Export and Imports: 2021	9
Export performance of onions in the last four years	10
Export analysis of onions: 2021-22	10
SPS-TBT standards for Onion	12
FPOs registered and working on onion in Karnataka	14
Processing technologies involving Onions	14
Action plan	15
Responsibility Matrix	16
Regulators and service providers	16

Introduction:

An onion (*Allium cepa* L., from Latin *cepa* meaning "onion"), also known as the bulb onion or common onion, is a vegetable that is the most widely cultivated species of the genus *Allium* that includes garlic, scallion, leek, and chive. This genus also contains several other species such as the Japanese bunching onion (*Allium fistulosum*), the tree onion (*A. proliferum*), and the Canada onion (*Allium canadense*).

As a food item, they are usually served, cooked or part of a prepared savory dish but can also be eaten raw or used to make pickles or chutneys. The name wild onion is applied to several *Allium* species, but *A. cepa* is exclusively known from cultivation. Some varieties of *A. cepa*, such as shallots and potato onions, produce multiple bulbs. Onions are frequently a biennial or a perennial plant but are usually treated as an annual crop and harvested in their first growing season.

The onion plant has a fan of hollow, bluish-green leaves and its bulb at the base of the plant begins to swell when a certain day-length is reached. The bulbs are composed of shortened, compressed, underground stems surrounded by fleshy modified scale (leaves) that envelop a central bud at the tip of the stem. In the autumn (or in spring, in the case of overwintering onions), the foliage dies down and the outer layers of the bulb become drier and brittle. The bulb can be white, yellow, or red and requires 80 to 150 days to reach harvest. The crop is harvested and dried and the onions are ready for use or storage. The crop is prone to attack by several pests and diseases, particularly the onion fly, the onion eelworm, and various fungi which can cause rotting.

Freshly cut onions are pungent when chopped and often cause a stinging sensation in the eyes of people nearby with uncontrollable tears. This is due to the release of a volatile liquid, syn-propanethial-S-oxide and its aerosol, which stimulates nerves in the eye. This gas diffuses through the air and soon reaches the eyes, where it activates sensory neurons. Lacrimal glands produce tears to dilute and flush out the irritant.

Nutrients:

Most onion cultivars are about 89% water, 9% carbohydrates (including 4% sugar and 2% dietary fiber), 1% protein, and negligible fat (table). Onions contain low amounts of essential nutrients and have an energy value of 166 kJ (40 kilocalories) in a 100 g (3.5 oz) amount. Onions contribute savory flavor to dishes without contributing significant caloric content.

Phytochemicals:

Considerable differences exist between onion varieties in phytochemical content, particularly for polyphenols, with shallots having the highest level, six times the amount found in Vidalia onions. Yellow onions have the highest total flavonoid content, an amount 11 times higher than in white onions. Red onions have considerable content of anthocyanin pigments, with at least 25 different compounds identified representing 10% of total flavonoid content. Onion polyphenols are under basic research to determine their possible biological properties in humans.

Some people suffer from allergic reactions after handling onions. Symptoms can include contact dermatitis, intense itching, rhino conjunctivitis, blurred vision, bronchial asthma, sweating, and anaphylaxis. Allergic reactions may not occur when eating cooked onions, possibly due to the denaturing of the proteins from cooking.

For more details on cultivation, seasons, pre- and post-harvesting visit:

<https://vikaspedia.in/agriculture/crop-production/package-of-practices/vegetables-1/onion-allium-cepa#:~:text=Varieties,-Multiplier%20Onion%20%2D%20Co&text=White%20Onion%20%2D%20Bhima%20Shubra%2C%20Bhima,Safed%2C%20N25791%2C%20Agrifound%20White.&text=Red%20onion%20%2D%20Bhima%20Super%2C%20Bhima,%2C%20Arka%20Kalyan%2C%20Arka%20Lalima>

Popular Onion varieties across the world:

Oignon de Roscoff

Roscoff, France: Oignon de Roscoff is an onion of the *Allium cepa* family, with a round, elongated to flattened shape produced in the Finistère region in France. The onion is full of flavor, slightly sweet and has a melt-in-the-mouth quality. The aromas are fruity, and the texture is juicy and crunchy while it is raw, and once it is cooked the texture becomes tender and the taste even sweeter. These onions are well known for their long shelf life and the high vitamin C content and are so popular that they even have their own museum in Roscoff.



Vidalia Onion

Vidalia, United States of America: Vidalia onion is a unique variety of onions with a sweet flavor, produced in Vidalia, Georgia in the United States of America. By 1977, the onions had their own annual festival, a tradition that continues up to this day. In 1990, Vidalia onions became the Official State Vegetable of Georgia. The onions are at their peak in late summer when they are used raw in salads or caramelized and combined with mashed potatoes.



Cebolla Fuentes de Ebro



Cebolla Fuentes de Ebro are the onion bulbs grown and packaged in the area of Fuentes de Ebro in Zaragoza. The onions come from Cebolla Dulce de Fuentes and Cebolla Blanca Gruesa de Fuentes varieties, traditionally grown in the mentioned area. Since they are grown in soil that contains only trace amounts of Sulphur, these onions are very mild in taste and do not leave an after taste. Externally, they are greenish to white and have a smooth appearance. Due to their high-water content, Cebolla Fuentes de Ebro are very crisp and succulent, making them perfect for raw consumption.

Oignon Doux des Cévennes

Gard, France: Unique sweet onion grown in the Gard region in France, with its rugged terrain and light soils that are not susceptible to parasites, and a Mediterranean climate with dry summers and heavy rainfall. The onions are pearly white to almost copper in color with an elongated bulb and delicate, translucent skin. On the inside, there is a firm, juicy, crunchy flesh with balanced flavors. The flavors are sweet and mild with hints of honey when the onion is consumed raw. It is just as good for cooking, making a great onion tart or a savory, thick onion soup with bread, pepper, olive oil and Gruyère cheese.



Makói vöröshagyma

Csongrád County, Hungary: It is a strong tasting, round onion from the Makó region in Hungary that has a very high dry matter percentage and firm, white flesh. The town of Makó is also called the "Hungarian onion capital" and holds an annual Onion Festival where one can sample tasty dishes made with these onions - bread, strudels, scones and others. The high dry matter content in the onion is due to the dry weather season at the end of summer, resulting in an onion which does not spoil easily and has a long shelf life. Its skin is bronze red in color and its strong, hot taste is owed to the high amounts of allyl sulphide (a colourless liquid with an intense smell) found in the Makoi hagyma.



Všestarská Cibule, Všestary, Czech Republic:

The high-quality onions produced in the Municipality of Všestary and the neighbouring areas in the Czech Republic. The onions come in a great number of varieties, namely Radar, Armstrong, Hyskin, Sedona, Hybelle, Sturon, Baldito, Narvito, Takmar, Canto, Wellington, Takstar, Viktory, Profit, and Festival. They come either in a spherical or ovate shape, with golden yellow skins, and a white to greenish-white flesh on the interior. The scent of the onions is sweet and slightly pungent, typical for onions. The taste is unique, delicately sweet with a varying degree of sharpness, depending on the variety of onion.



Cipolla Rossa di Tropea Calabria

Calabria, Italy: Named after the Calabrian town of Tropea settled along the Tyrrhenian coast in the province of Vibo Valentia, Cipolla Rossa di Tropea Calabria refers to the red onions of the following cultivars: Tondo Piatta (early ripening), Mezza Campana (mid-season) and Allungata (late ripening). They are further categorized into three types: Cipollotto (scallion), Cipolla da Consumo Fresco (fresh onion) and Cipolla da Serbo (preserved onion). Fully ripe Tropea onions are either round or slightly elongated, succulent and particularly sweet.



Cipolla di Certaldo

Certaldo, Italy: Cipolla di Certaldo is a symbol of the Tuscan town of Certaldo – beloved local onions were even mentioned in book VI of the Decameron, a famous work by Giovanni Boccaccio, who was born in Certaldo. Cipolla di Certaldo truly has a special meaning for the locals - they even call themselves cipolloni, meaning big onions. There are two main types of these onions, and each is harvested in a different season. Statina is a summer onion, characterized by a light violet color, juicy texture, and relatively sweet flavor, while the dark red vernina, which is harvested in autumn, has a strong, pungent flavor.



Cipolla di Giarratana

Giarratana, Italy: Listed as a traditional Italian food product, Cipolla di Giarratana is a huge, very sweet variety of onion, grown only in the small Sicilian village of Giarratana, located in the Hyblaean Mountains. Ranging in size from 200 grams to 2 kg, they are often sold with a long stem, so they can be hung when stored. The paper-thin golden skins hide a juicy, white interior with a very delicate flavor. Due to their deliciousness, Giarratana onions are often eaten raw in salads, but they are also excellent when used as a filling for focaccia, simply grilled or baked with various condiments.



Höri-Bülle - Höri, Germany



This variety of red onion with a distinct shape and color is traditionally grown on the Lake Constance peninsula of Höri. The outer skin has an intense red-brown color that does not rub off when the onions are cut, and their typical flattened form is particularly well suited to weaving traditional onion braids. Hori-Bülle onion is characterized by its delicate aroma and mild, delicate flavor. This makes it an ideal onion to eat raw – Höri-Bülle performs quite well in salads. When cooked, Bülle develops a rich aroma without losing its characteristic red color.

Varieties of commercially grown onions in India:

India is the second-largest onion-growing country in the world. The Indian onions are famous for their pungency and are available round the year. Indian onions have two crop cycles, first harvesting starts from November to January and the second harvesting from January to May.

Varieties: The major varieties found in India are Agrifound Dark Red, Agrifound Light Red, NHRDF Red, Agrifound White, Agrifound Rose and Agrifound Red, Pusa Ratnar, Pusa Red, and Pusa White Round. There are certain varieties of yellow onion which are suitable for export in European countries Tana F1, Arad-H, Suprex, Granex 55, HA 60 and Granex 429.

For more varieties visit: <https://icar.org.in/node/323>

Areas of Cultivation : The Major Onion producing states are Maharashtra, Karnataka, Madhya Pradesh, Gujarat, Bihar, Andhra Pradesh, Rajasthan, Haryana and Telangana. Maharashtra ranks first in Onion production with a share of 39% followed by Madhya Pradesh with a share of 17% in 2020-21.

India Facts and Figures : There is a lot of demand for Indian Onion in the world, the country has exported 1,537,496.89 MT of fresh onion to the world for the worth Rs. 3,432.14 crores/ 460.52 USD Millions during the year 2021-22.

Modern packhouses for sorting, grading and packing the quality onions are available at production zones. Guidelines have been framed to determine the compliance with maximum residue levels (MRLs) for the identified pesticides. Grade designation and quality development parameters have been set up.

Source: APEDA Agri exchange.

GI tagged onions of India:

Lasalgaon Onions

granted the Geographical Indication Tag (GI) in 2016 and the mapped area is Niphad, Tehsil, Nashik District, Maharashtra. Lasalgaon onions are light red in colour as compared to other varieties of Onions. The black soil of Lasalgaon has high alumina and carbonates of calcium and magnesium, low nitrogen and phosphorus as well as potash. The soil is only moderately alkaline which renders a good yield and excellent quality onion bulbs. As the soil has high sulphur content, the taste and pungency of the onion is much more evident and higher than other varieties. The size of the bulb is bigger than the other varieties with about 16 to 17 layers of outer dried intact scales that protect the inner fleshy bulb. Lasalgaon onion is rich in Vitamin B2, Vitamin C, minerals, antioxidants, Calcium and Iron and has many medicinal properties. The onions from Lasalgaon market are transported across India and exported to Singapore and Malaysia. These onions are known for lowering the risk of several types of cancer, improving mood and maintaining the health of skin and hair.



Bangalore Rose Onions



The bulbs of these onions are spherical and have a flat base known for their high pungency. The high pungency makes it preferable in making pickles. The uniqueness of deep scarlet red colour of the Bangalore rose onions has resulted from combination of anthocyanins and phenols. They also have higher levels of protein, phosphorus, iron and carotene. These onions are grown only in and around Bengaluru, that is Bengaluru Urban, Bengaluru Rural, Kolar and Chikkaballapur districts. The climate and soil condition of the area are ideally suited for this variety of onion. Deep fertile mekklu soil and sand mix of red soil of the area with good infiltration, soil pH ranging between 6.5 to 7, atmospheric humidity of 70 to 75% and average temperature of 25 to 35 C is most suitable. Bangalore Rose Onions are not consumed locally but are exported to other countries and the tag could only be a status symbol.

Top 10 Exporting countries of the World: 2021

Rank	Country	% Share	Value USD
1.	Netherlands	19.23%	\$743.16M
2.	India	11.63%	\$449.50M
3.	China	11.28%	\$435.89M
4.	Mexico	11.12%	\$429.48M
5.	United States	6.84%	\$264.21M
6.	Spain	4.31%	\$166.65M
7.	Pakistan	3.76%	\$145.41M
8.	Peru	3.69%	\$142.42M
9.	New Zealand	3.67%	\$141.90M
10.	Egypt	3.45%	\$133.16M

Top 10 Importing countries of the World: 2021

Rank	Country	% Share	Value USD
1.	United States	14.18%	\$537.85M
2.	Malaysia	5.46%	\$207.07M
3.	United Kingdom	5.33%	\$202.10M
4.	Germany	5.25%	\$199.22M
5.	Vietnam	5.16%	\$195.66M
6.	Canada	4.98%	\$188.84M
7.	Netherlands	4.17%	\$158.01M
8.	Bangladesh	4.07%	\$154.30M
9.	Japan	3.44%	\$130.45M
10.	Sri Lanka	3.13%	\$118.68M

Production data of Onions: 2020

Rank	Country	% Share	Production Quantity
1.	India	25.58%	26.74M
2.	China	22.64%	23.66M
3.	Unites States	3.66%	3.82M
4.	Egypt	3.02%	3.16M
5.	Turkey	2.18%	2.28M
6.	Pakistan	2.03%	2.12M
7.	Iran	1.97%	2.06M
8.	Bangladesh	1.87%	1.95M
9.	Sudan	1.87%	1.95M
10.	Indonesia	1.74%	1.82M

Source: <https://www.tridge.com/intelligences/onion>

State-wise production data of onions (2021-22):

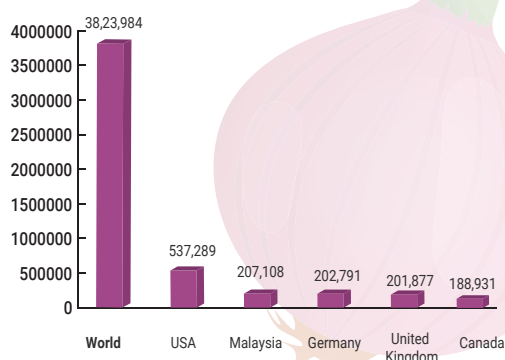
In fiscal year 2022, the volume of onion production in India is estimated to have amounted to nearly 32 million metric tons. There was a constant growth in production of the root vegetable in recent years across the country except for in 2019. Maharashtra and Karnataka ranked the highest in the production of onions during the measured time period.

World Export and Imports: 2021

070310: Fresh or chilled onions and shallots

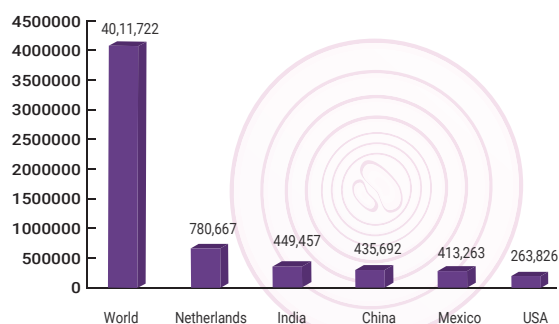
2021 Global Imports 3,823,984 USD.

No.	Country	Value USD
1.	USA	537,289
2.	Malaysia	207,108
3.	Germany	202,791
4.	United Kingdom	201,877
5.	Canada	188,931



2021 Global Exports 4,011,722 USD.

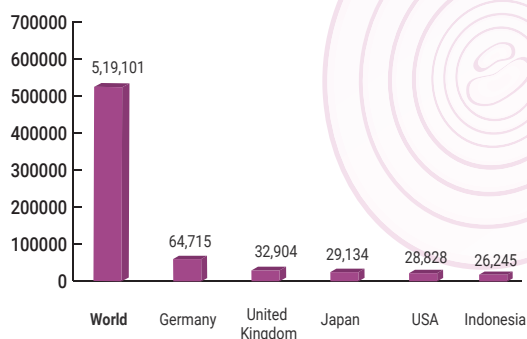
No.	Country	Value USD
1.	Netherlands	780,667
2.	India	449,457
3.	China	435,692
4.	Mexico	413,263
5.	USA	263,826



080390: Dried onions, whole, cut, sliced, broken or in powder, but not further prepared

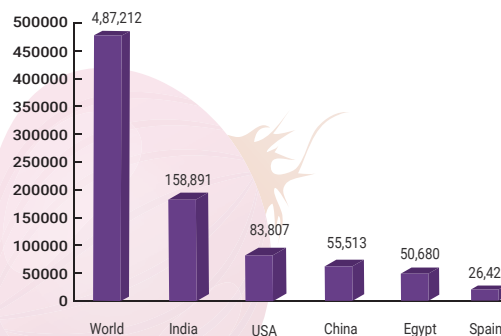
2021 Global Imports 519,101 USD.

No.	Country	Value USD
1.	Germany	64,715
2.	United Kingdom	32,904
3.	Japan	29,134
4.	USA	28,828
5.	Indonesia	26,245



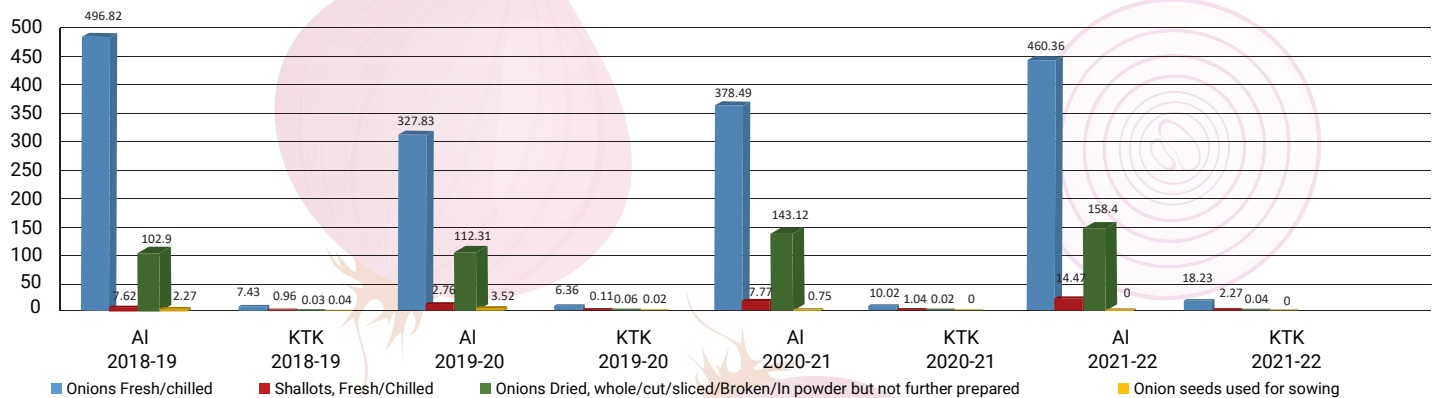
2021 Global Exports 487,212 USD.

No.	Country	Value USD
1.	India	158,891
2.	USA	83,807
3.	China	55,513
4.	Egypt	50,680
5.	Spain	26,420



Export performance of Onions in the last four years: All India and Karnataka.

Value in Mn USD											
No.	HS Code	Description	2018-19		2019-20		2020-21		2021-20		Major Importing Countries
			AI	KT K	AI	KT K	AI	KT K	AI	KT K	
1	07031010	Onions Fresh/chilled	496.82	7.43	327.83	6.36	378.49	10.02	460.36	18.23	Bangladesh, Malaysia & Sri Lanka
2	07031020	Shallots, Fresh/Chilled	7.62	0.96	2.76	0.11	7.77	1.04	14.47	2.27	Sri Lanka, Malaysia & Thailand
3	07122000	Onions Dried, whole/cut/sliced/Broken /In powder but not further prepared	102.90	0.03	112.31	0.06	143.12	0.02	158.40	0.04	Germany, USA & Brazil
4	12099130	Onion seeds used for sowing	2.27	0.04	3.52	0.02	0.75	Nil	0.00	Nil	Nepal, Bahrain IS and Canada

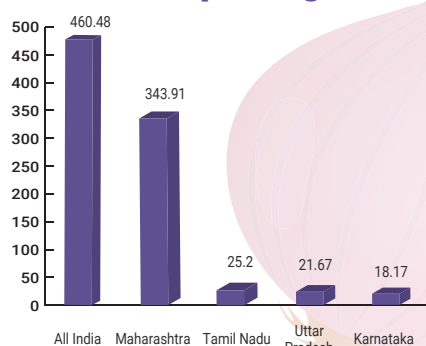


Export analysis of onions: 2021-22

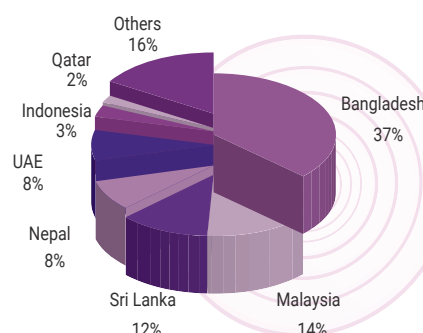
07031010: Onions Fresh/chilled

No.	State	Value USD Mn	Destination
1.	All India	460.48	Bangladesh, Malaysia, Sri Lanka (+50)
2.	Maharashtra	343.91	Bangladesh, Malaysia, Sri Lanka (+47)
3.	Tamil Nadu	25.20	Sri Lanka, Malaysia, Maldives (+18)
4.	Uttar Pradesh	21.67	Nepal, UAE, Sri Lanka (+6)
5.	Karnataka	18.17	Malaysia, Sri Lanka, Brunei (+11)

Exporting States



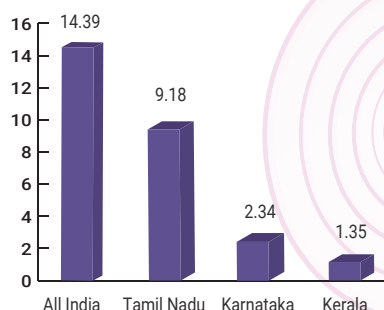
Importing Countries



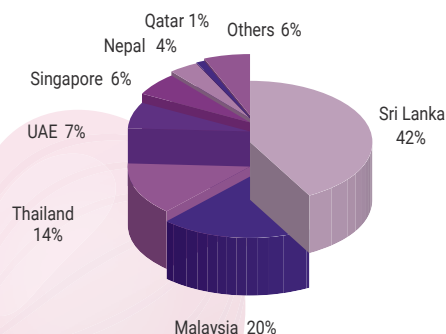
07031020: Shallots, Fresh/Chilled

No.	State	Value USD Mn	Destination
	All India	14.39	Sri Lanka, Malaysia, Thailand (+27)
1.	Tamil Nadu	9.18	Sri Lanka, Malaysia, Thailand (+13)
2.	Karnataka	2.34	Malaysia, Thailand, Singapore (+5)
3.	Kerala	1.35	UAE, Oman, Kuwait (+16)

Exporting States



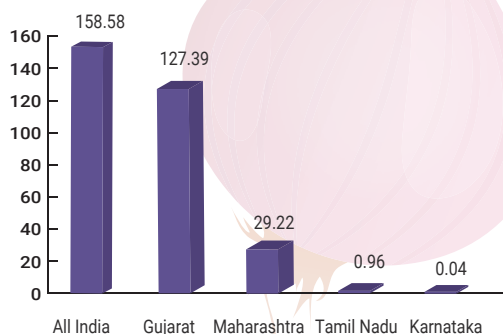
Importing Countries



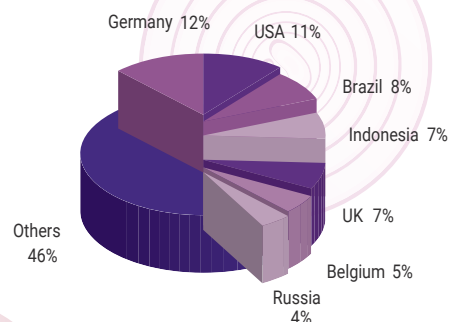
07122000: Onions Dried, whole/cut/sliced/Broken/In powder but not further prepared

No.	State	Value USD Mn	Destination
	All India	158.58	Germany, USA, Brazil (+110)
1.	Gujarat	127.39	Germany, USA, Brazil (+97)
2.	Maharashtra	29.22	Indonesia, Belgium, UK (+65)
3.	Tamil Nadu	0.96	Canada, Sri Lanka, Malaysia (+13)
4.	Karnataka	0.04	Oman, Malaysia, Canada (+4)

Exporting States



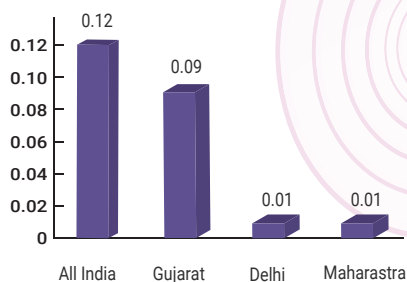
Importing Countries



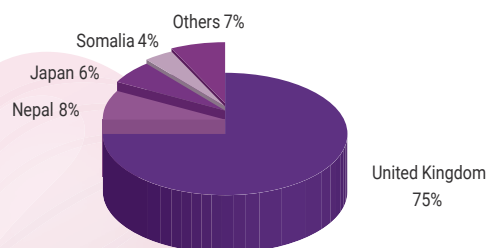
12099130: Onion seeds used for sowing

No.	State	Value USD Mn	Destination
	All India	0.12	United Kingdom, Nepal, Japan (+6)
1.	Gujarat	0.09	United Kingdom, USA, Nepal
2.	Delhi	0.01	Nepal, Japan
3.	Maharashtra	0.01	Japan, Somalia, Baharain (+3)

Exporting States



Importing Countries



SPS -TBT Standards for onions

1.General Characteristics:

Color: i) Red onions - pinkish red colored skin. ii) White onions - white colored skin.

Shape: Generally, round, and oval onions are preferred. Flat based onions can be included.

Size: Onions with a diameter of 4.0-6.5 cm having a weight more than 100-150 Grams/piece is preferred. (8-10 Onions/ Kg).

Texture: Onion should be hard and firm at the neck point. Onions must be properly cured, and a thin, dried outer layer should be intact.

Grades: Onion is categorized into 3 three grades:

Big onions: more than 150 grams/piece –for salad making and for hotels

deal/medium sized onion: 100 grams and above – general customers prefer this.

Sambar/ baby onions: 50 grams and below – preferred by South Indians for making Sambhar and other dishes

2.Selection of good Quality Onions specifications:

- Medium sized, round onions with flat tops.
- Bulbs must be firm, hard, and dried.
- A smaller and tightly closed neck point.
- Skin must be thin, papery, dried, and intact with bulb.
- The fleshy scales should not be exposed.

3. Rejections Specifications:

- Very large and under sized onions.
- Green tops or sprouted onions.
- With loose or half peeled outer skins.
- Dual or double bulbs.
- With soft, long and open lose necks.
- Damaged, deformed bulbs or any cut on surface.
- Diseased bulbs having aspergillus rot characterized by blackish scale with soft texture and foul smell.

4. Packaging specifications for exporting Onions from India:

https://apeda.gov.in/apedawebsite/six_head_product/Brochure_05_Onion_&Potatoes.pdf

5. Latest modifications and amendments to Onion exports: (APEDA)

https://apeda.gov.in/apedawebsite/Latest_Notification/Fresh-onion.html

FPO's registered and working on Onion in Karnataka:

1. Bangalore Rose Onions: Shree Gangabhavani horticulture Farmer Producers Company Ltd – Bhashettahalli, Shidlaghatta tq, Chikkaballapur.
2. Red Onions - Tungabhadra Farmer Producer Organisation Ltd, Hospet, Vijayanagar District.
3. Red Onions – Hunagund Horticulture Farmer Producers Company Limited, Hunagund Taluk, Bagalkot district.

Processing technologies involving onions:

1. Onion flavored biscuit - <https://cftri.res.in/technologies/BP/ofb.pdf>
2. Ready mix: Upma - <https://cftri.res.in/technologies/CONP/rmu.pdf>
3. Minimally processed vegetables - <https://cftri.res.in/technologies/FVP/mpv.pdf>
4. Dehydration of Fruits & Vegetables: <https://cftri.res.in/technologies/FVP/dof.pdf>
5. Shelf-stable biriyani paste: <https://cftri.res.in/technologies/MMP/ssb.pdf>
6. Cooking base mix: <https://cftri.res.in/technologies/MMP/cbm.pdf>



Action plan:

Measures for Enhancing Competitiveness for Exports:

- India exports most of its Onion to Sri Lanka, Malaysia and United Arab Emirates and is the 2nd largest exporter of Onion in the World.

The top 3 exporters of Onion are India with 556,862 shipments followed by China with 40,042 and Ethiopia at the 3rd spot with 35,976 shipments.

More than 100 countries throughout the world, mainly in the Middle East, Southeast Asia, and the United States, import a substantial portion of the fruits and vegetables produced in India. According to the National Horticulture Database, approximately 26.74 lakh metric tonnes of fresh Onion worth \$449.50 million were exported from India last FY.

- Indian government is providing a 5% subsidy on onion export from India to encourage the sale of any surplus outside of India.
- India emerged as the world's largest onion producer in 2020. Indian onions are known for their spiciness and year-round availability around the globe. In addition, Onion is a crucial ingredient in many Indian recipes, including curries and side dishes.
- Though India is the leading producer and exporter of onions in the world, our onions have very low keeping quality. They cannot be stored for a long time especially when our production is in excess. Growers and traders face a huge loss during such times and government intervention in this regard is needed.

Experts from agricultural markets and international traders suggest developing new technology to increase the shelf life of onions and reduce disease, fungus and rot susceptibility in harvested bulbs.

Our state exports 99% of Bangalore rose onions due to its uniqueness and geographical indication tag whereas other onions face rejections due to poor quality, size and shelf-life. Hybrids and new varieties that yield better quality bulbs must be introduced to traditional growers of onions so that Karnataka can also establish itself in the export market.

Responsibility Matrix

No.	Actions	Responsibility
1.	Research on best global varieties.	Agricultural and Horticultural Universities, Karnataka
2.	Delegation of progressive farmers to France, Hungary and Italy.	Horticulture department, Karnataka
3.	Farmer Sensitization program on available opportunities.	Agriculture and Horticulture departments, Karnataka.
4.	Inviting Exporters/entrepreneurs to Investors meet for contract farming and processing industries.	Horticulture Department and DIC Districts.
5.	Farmer database and aggregation of the produce.	Horticulture department and related FPOs
6.	Processing technology and Value Addition Handholding.	Horticulture department through CFTRI, Mysore and IIFPT, Thanjavur
7.	Export training, orientation and Market Intelligence.	VTPC Karnataka.

Regulators and Service providers

No.	Organization	Service	Contact
1.	APEDA	RCMC, Market survey and assistance.	1st Floor, Beeja Bhavan, Bellary Rd, Hebbal, Bengaluru - 560024. E: apedabl@apeda.gov.in
2.	KAPPEC	PMFME Scheme	17, Richmond Rd, Shanthala Nagar, Richmond Town, Bengaluru - 560025. E: kappec1996@gmail.com
3.	DGFT	IEC, Customs and ICEGATE	6th floor, Kendriya Sadan, C & E Wing, 17th main, Koramangala 2nd Block, Koramangala, Bengaluru - 560034 E: bangalore-dgft@nic.in
4.	Plant Quarantine	Phyto Sanitary certification (SPS)	Hebbal-Boopasandra Road HA Farm Post, Bengaluru - 560024. E: dd-pqfsb-ka@nic.in
5.	BIAL Cool Port	Freight and Flight	KIAL Road, Devanahalli, Bengaluru -560300 W: http://www.aisats.in