

CHAPTER- 6

LITCHI

1. Introduction

Litchi (*Litchi chinensis*) is most liked and relished fruit of India. Litchi is cultivated in an area of 63.3 thousand ha and total production is around 381.4 thousand tons.

World scenario

Major litchi producing countries are India, China, Taiwan, Thailand, South Africa, Madagascar and Australia, while India is the largest producer. However, China and Taiwan come next to India in production, producing approx 131 thousand tons and 101 thousand tons of litchi respectively. Although authentic data on production of litchi is not available, however, total world production is estimated around 6 to 6.5 lakh tons.

Indian scenario

There is a sizeable increase in acreage and production of litchi in India. Cultivation of litchi has increased from 53.7 thousand ha in 2003-04 to 63.3 thousand ha in 2005-06. In terms of production; however, it has decreased from 478.5 to 381.4 thousand tons. The total production of litchi is concentrated mainly in Bihar, West Bengal, Assam and Jharkhand and to a smaller extent in Tripura, Punjab, Uttarakhand and Orissa.

Table 6.1: Showing the area production and productivity of litchi in India

YEAR	AREA (000' ha)	PRODUCTION (000' tons)	PRODUCTIVITY (tons/ha)
2001-02	58.1	355.9	6.1
2002-03	54.1	476.4	8.8
2003-04	53.7	478.5	8.9
2004-05	60.0	368.6	6.1
2005-06	63.3	381.4	6.0

Source: Indian Horticulture Database, 2006

2. Major producing states with production of last three years

Bihar is the leading state in litchi production (200.1 thousand tons.), followed by West Bengal (74.9 thousand tons.) and Assam (24.4 thousand tons.). Production ranges from 11.9 thousand tons. in Orissa to 16.5 thousand tons. in Jharkhand. Most plantations in Uttarakhand are young and have yet to start bearing.

Table 6.2: Area, production and productivity of leading litchi growing states in India

STATE	AREA(000'ha)			PRODUCTION (000'tons)			PRODUCTIVITY (tons/ha)		
	2003-04	2004-05	2005-06	2003-04	2004-05	2005-06	2003-04	2004-05	2005-06
Bihar	28.3	28.4	28.4	339.0	204.9	200.1	12.0	7.2	7.0
West Bengal	6.6	7.2	8.1	64.7	69.9	74.9	9.8	9.8	9.3
Assam	4.2	4.5	4.7	19.8	22.5	24.4	4.7	5.0	5.2
Jharkhand	1.6	1.4	1.4	7.5	16.5	16.5	4.7	12.0	12.0
Tripura	2.2	2.2	2.3	12.5	12.4	14.3	5.7	5.6	6.2
Punjab	1.2	1.3	1.4	12.2	12.6	13.8	10.2	10.0	10.0
Uttarakhand	1.8	6.7	7.9	5.8	8.9	13.6	3.2	1.3	1.7
Orissa	3.9	3.9	3.9	11.9	11.9	11.9	3.1	3.0	3.0
Others	3.9	4.6	5.2	5.1	8.9	11.8	2.2	3.3	2.6
Total	53.7	60.0	63.3	478.5	368.6	381.4	8.91	6.14	6.03

Source: Indian Horticulture Database, 2006

3. Description of commercially grown varieties

Table 6.3: Showing the varietal characteristics of commercially grown litchi

Variety	Characteristics
Shahi	Fruits are globous- heart or obtuse in shape. The colour is rose madder and fuchsia purple background with red tubercles at ripening and the weight ranges from 20-25 gms. with T.S.S. of 19-22° brix
China	Fruits are oblong in shape. The colour is tyrant rose with dark tubercles at maturity and the fruit size is large, medium- heavy in weight, with T.S.S. of 18-17° brix
Early Bedana	Fruits are oval or heart shaped. The colour is uranium green with carmine red tubercles at maturity and the fruit size is medium, weight ranges from 15 to 18 gms. with T.S.S. of 17.2-19.8° brix
Late Bedana	Fruits are conical in shape. The colour is vermilion to carmine with dark blackish-brown tubercles at maturity and the fruit size is medium, with T.S.S. of 18-20° brix
Bombai	Fruits are obliquely heart shaped. The colour is carmine red and the fruit size is large, and weighs 15-20 gms. with T.S.S. of 17° brix

4. Good Agricultural Practices (GAP)

- Enhancing establishment of air layered plants in the field
- Adoption of high density planting
- Conservation of soil moisture with mulching
- Integrated nutrient management
- Irrigation frequency to be maintained to avoid fruit cracking
- Integrated pest and disease management

5. Harvesting season of crop in leading states

India has unique advantage as litchis start ripening from 15th April in Tripura and harvest season lasts in other states up to end of June, thus giving enough time to exploit litchi importing countries market

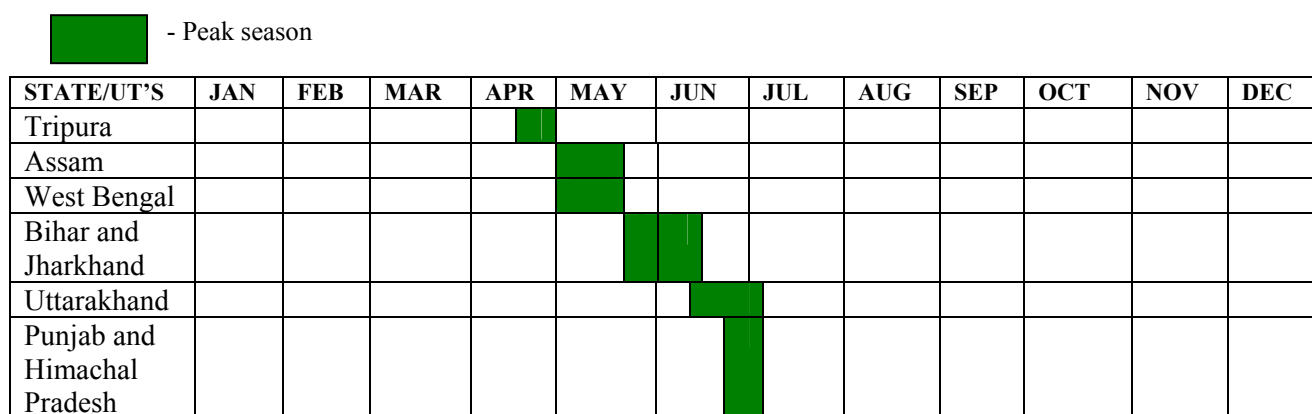


Fig. - 13

*The above graph shows Harvest pattern in leading litchi growing states

6. Arrival pattern in market

The arrival pattern of litchi in leading states are given below in the table 6.4

Table 6.4: Details of arrival pattern of litchi in leading states

S.No.	States	Season of Availability
1.	Tripura	15 th April to end of April
2.	Assam	1 st May to 3 rd week of May
3.	West Bengal	1 st May to 3 rd week of May
4.	Bihar and Jharkhand	3 rd week of May to 2 nd week of June
5.	Uttarakhand	2 nd week of June to 4 th week of June
6.	Punjab and Himachal Pradesh	3 rd week of June to last week of June

7. (a) Concentrated pockets

The details of concentrated pockets of litchi in different states are listed below in table 6.5

Table 6.5: Shows concentrated pockets of litchi in litchi growing states

State	Districts
Bihar	Muzaffarpur, Vaishali, Sitamrhi, East Champaran, West Champaran, Katihar, Gopalganj, Siwan, Samastipur, Saran, Sheohar, Darbhanga, Madhubani Purniya,, Begusarai, Saharsa, Bhagalpur, Araria, Kishanganj, Khagariya, Madhepura, Munger
Assam	Bongoigaon, Kamrup, Golpara, Nalbari, Barpeta, Sonitpur, Nagaon, Lakhimpur, Golaghat, Jorahat ,Cachar
West Bengal	Mushirdabad, 24- Parganas, Nadia, 24- Parganas South Malda, Uttar Dinajpur, Dakshin Dinajpur, Hubli
Orrisa	Sundergarh, Sambalpur, Angul, Deogarh
Uttarakhand	Udham Singh Nagar, Champawat, Nainital, Dehradun, Tehri Garhwal, Pauri Garhwal,Haridwar
Punjab	Gurdaspur, Hoshiarpur
Tripura	West Tripura, North Tripura, South Tripura, Dhalai Tripura

7.(b) Catchment areas of market

Table 6.6: Showing the details of catchment areas of market of litchi in leading states

States	Districts (Market)	Blocks
Bihar	Muzaffarpur	Sahebganj,Baruraj,Hursepur,Minapur,Kanti,Paru-I,Paru-II, Kurhani,Sacra,Dholi,Bochacha,Gaihati,Katra,Aurai.
	Sitamarhi	Majorganj,Pariharpur,Riga,Bathnaha,Sursnd,Bazpatti,Pupri ,Nanpur,Pumra,Belsand,Bairagnia.
	East Champaran	Raxaul,Ramgarhwa,Chiraiya,Dhaka,Palahi,Mehsi,Kesriya, Chakia,Areraj,Paharpur.
West Bengal	Murshidabad	Suti, Jangipur, Raghunathganj, Lalgola, Bhagwangola, Sagardighi, Jiaganj, Lalbagh, Domkal, Bahranpur, Hariharpura, Belaanga, Nawada ,Bharatpura, Barwan, Khargram
Uttarakhand	Udham Singh Nagar	Rudrapur, Sitarganj, Khatima, Gosukuan, Chakarpar, Senapati, Bichwa, Pant Nagar, Bazpur, Kashipur, Jaspur
	Nainital	ManumaHami, Mallital, Tallital.
	Dehradun	Tapovan, Haripur, Kaiffi, Rajpur, Kishanpur, Garhi.
Punjab	Gurdaspur	Dhar, Pathankot, Batala, Phongota, Dunera, Sujanpur, Madhopur, Chaki, Jakolar, Fatehgarh, Jaintipur, Bhet
	Hoshiarpur	Mukerian, Dasuya, Dholbaha, Hazipur, Namoli, Bhamotar, Dadiyal, Garhdiwala,Miani,Phuglana,Mahalpur,Lalwan
Uttar Pradesh	Saharanpur	Badshahrbagh, Raipur, Muzzafarabad, Kalsia, Behat, Chilkana, Rampur, Sarsawa, Pilkhani, Bhayla, Deoband, Gangoh, Lukhnauti, Nanauta

8. Criteria and description of grades

According to Agmark standards litchi is classified into following classes, the table is given below:

Table 6.7: Details of various classes of litchi as per AGMARK standards

Grade designation	Grade requirements	Grade tolerances
1	2	3
Extra class	Litchis must be of superior quality. They must have the shape, development and colouring that are typical of the variety and/or varietal type. They must be free of defects, with the exception of very slight superficial defects, provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package.	5% by number or weight of Litchis not satisfying the requirements for the grade, but meeting those of Class I grade or exceptionally coming within the tolerances of that grade.
Class I	Litchis must be of good quality. They must be characteristic of the variety and/or commercial type. The following slight defects however may be allowed provided these do not affect the general appearance of the produce, the quality, the keeping quality and presentation in the package. - slight defects in shape - slight defects in colouring; - slight skin defects Provided these do not exceed a total area of 0.25 sq.cm	10% by number or weight of Litchis not satisfying the requirements of the grade, but meeting those of Class II grade or, exceptionally coming within the tolerances of that grade
Class II	This grade includes Litchis which do not qualify for inclusion in the higher grades, but satisfy the minimum requirements specified in general characteristics. The following defects may be allowed, provided, the Litchis retain their essential characteristics as regards the quality, the keeping quality and presentation. - defects in shape, - defects in colouring, - skin blemishes provided these do not exceed a total area of 0.5 sq. cm.	10% by number or weight of Litchis not satisfying the requirements of the grade, but meeting the minimum requirements.

PROVISION CONCERNING SIZING

Table 6.8: Size is determined by the maximum equatorial diameter.

Grade	Minimum Equatorial diameter (in mm.)
Extra class	33
Class I	28
Class II	23

Size tolerance

For all grades, 10% by number or weight of litchis not satisfying the requirements as regards the minimum size, provided, however, that the diameter is not less than 23 mm.

9. Packaging and its details

(a) For Export

Normally Corrugated Fibre Board boxes of capacity 2 kg and 4 kg are used for export. The detailed specifications of CFB are given below in the table 6.9

Table 6.9: Specification details for Corrugated Fibre Board (CFB) Boxes for packing litchis for exports

Characteristics	Requirements	
	2 Kg	(4 kg.)
Dimension	270X150X100	375X275X100
Material of construction	3 Ply Corrugated fibre board	3 Ply Corrugated fibre board
Grammage(g/m sq),Min (outer to inner)	*230/140/140	*230/140/140
Bursting strength kg/cm sq, Min	6.00	10.00
Puncture resistance, ozs inches/tear inch Min	100	250
Compression strength, kgf , Min	225	350
Cobb (30 minutes) g/m sq, Max	130	130

* Outer ply of duplex board

Source: Quality Assurance Manual for Export of Litchis, APEDA, New Delhi

(b) For domestic markets

For domestic markets also, the litchis are packed in Corrugated Fiber Board boxes.

10. Distribution of produce from primary to terminal market

- Litchi grown in Bihar and West Bengal is transported to the big cities for marketing.
- Patna and Kolkata are the most important markets for dispatch of litchi.
- Litchi produced in Bihar and West Bengal find markets in Ahmedabad, Mumbai, Pune, Nagpur, Hyderabad, Delhi, Chandigarh, and Lucknow etc.

11. Price Graph of litchi in metros

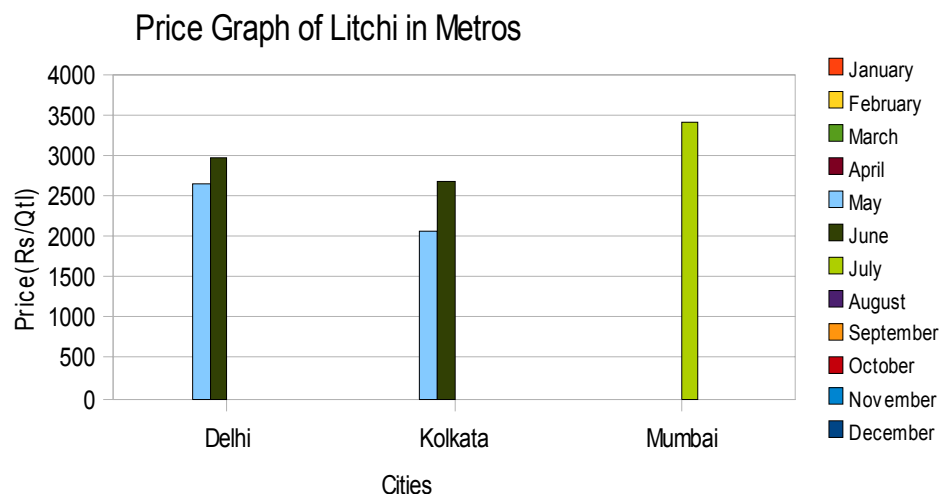


Fig. - 14

*The above graph showing the price (in Rs./Qtl.) of litchi in major cities

12. Exports and export potential

A. Domestic strengths for export

Domestic strengths for exporting litchi are detailed below:

- India is the largest producer of litchi in the world.
- India produces superior litchi varieties having high pulp to stone ratio and with high yields.
- India has been gifted with unique ripening pattern of litchi, as litchi starts ripening from 15th April in Tripura, 1st week of May in Assam and West Bengal; 3rd week of May in Bihar & Jharkhand, and season ends after ripening terminates in Punjab in last week of June. Thus, India has 2.5 months time to export litchi.
- India is in advantageous position with regard to geographical location compared to Thailand and China, as India is nearer to Europe and Gulf countries for exporting litchies to these countries.
- India has not to compete with Madagascar, South Africa and Australia as these countries produce litchi during November to February months, nor India is to compete with Israel as its litchi arrives during July to October months.

- Indian litchi is earliest to arrive, as litchi ripens 15 days earlier than Thailand and Chinese litchies ripen one month later, i.e. in June. Thus during this period there is comparatively less competition from China for exporting litchi to European markets.
- Agri Export Zones have already been set up in litchi growing areas of Bihar, West Bengal and Uttarakhand states.
- Pack houses for exporting litchi are already available in Bihar, West Bengal and Uttarakhand states.
- A specialized fumigation chamber has been set up in Malda area of West Bengal.

B. Exports

Export of litchi has increased from 347 tons in 2002-03 to 1661 tons in 2006-07 (APEDA database). Major amount of these exports i.e 1642 tons were to SAARC countries and only 17 tons were sent to UAE. (Table 6.10 & Fig. 15).

Table 6.10: Export of litchi in the last five years

Years	Quantity (tons)	Value (in Rs. Lakh)
2002-2003	347	100.2
2003-2004	962	133.9
2004-2005	544	70.8
2005-2006	718	93.6
2006-2007	1661	164.3

Source: APEDA Database, 2006-07

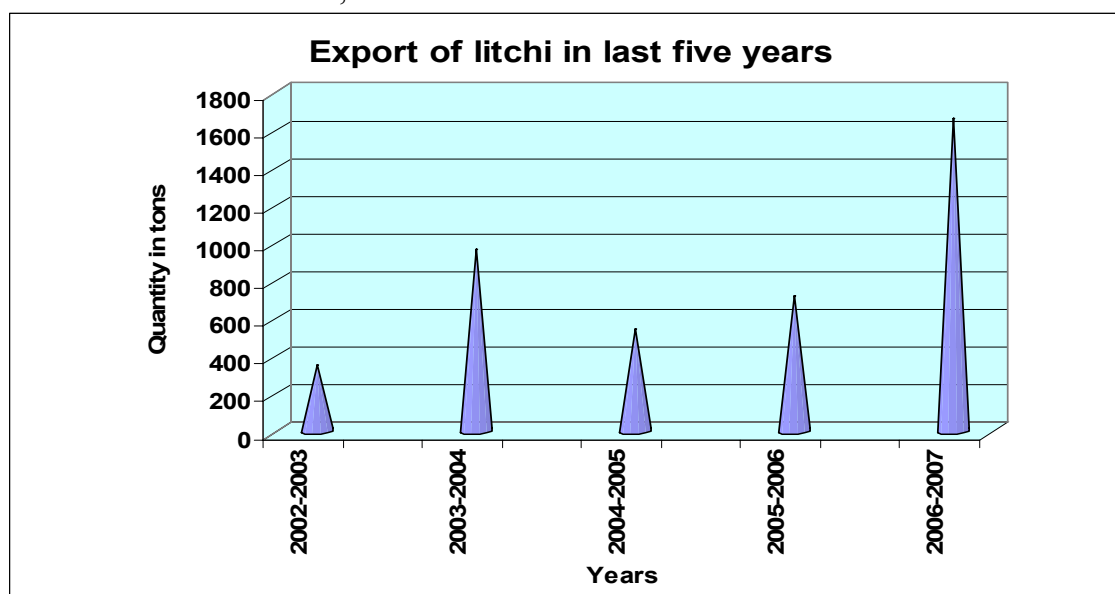


Fig. - 15

As per the data of 2005-06, also virtually there were no exports to Gulf countries. For both the years, 2005-06 and 2006-07, there were no exports to European countries too. However, during

2003-04, 140 tons of litchi were exported to Belgium, 64 tons to UK and 34 tons to Netherlands. This shows that the exports to EU have declined inspite of the fact that the Indian litchi is available 2-3 weeks earlier than Thai litchi and 4-5 weeks earlier than Chinese litchi.

C. Export potential

The potential for export of litchi is discussed in the following paras:

(i) GCC countries

Gulf countries imported litchi during 2006 up to 45,545 tons (Comtrade database). As per this database India exported litchi to GCC countries to the tune of 16,410 tons, however, APEDA database depicts no export of litchi during 2005-06 and 2006-07 to Gulf countries.

Nevertheless, there is excellent potential for export of litchi to GCC countries, as India produces finest litchis. Litchis in India are available from 15th April (Tripura) onwards up to third week of June (Gurdaspur, Punjab). India is also supplying litchis to GCC countries at competitive prices compared to Thailand. Appropriate infrastructure is also available for post- harvest handling in a couple of states. India is also nearer to Gulf countries compared to Thailand and China. There is no reason why India can not export litchi to Gulf countries up to 4000 to 5000 tons in next 4-5 years.

(ii) EU countries

EU countries imported sizeable quantities of litchi during 2006. However, inspite of excellent potential for exports and even nearness of EU countries to India compared to Thailand and China, India has not been able to export any visible amount of litchi to EU except during 2003-04 when some amount of litchi was exported. The potential needs to be exploited by aggressive marketing and supplying better quality litchi having minimum pesticide residues etc.

D. Measures for enhancing competitiveness for exports

Following measures are likely to enhance competitiveness of India in exporting litchi:

- To exploit export of organic litchi in foreign markets, its cultivation in Tripura and Assam needs to be encouraged and to facilitate it, packhouses need to be established in a phased manner. Side by side markets for organic litchi need to be identified.
- Litchi producing areas in Gurdaspur and Hoshiarpur districts of Punjab are near to Amritsar international airport. Export of litchi from this area can be enhanced by setting up of packhouse in the area.
- Technology for CA and MA storage of litchi needs to be standardized perfected so that shelf life of litchi can be extended. Then, litchi to nearer areas like Gulf countries can be sent by reefer containers through MA cartons, if perfected.
- Residue analysis laboratory need to be set up in at least Muzaffarpur, Bihar to begin with.

13. Storage

Temperature	:	2-3°C
Relative Humidity	:	90-95%
Storage Period	:	3-5 weeks

Sensitivity to refrigeration and ethylene.

14. Documents required for exports

a) Documents related to goods

a) Invoice b) Packing List c) Certificate of origin

b) Documents related to shipment

a) Mate Receipt b) Shipping Bill c) Bill of lading d) Airway Bill

c) Documents related to Payment

a) Letter of Credit (L/C) b) Bill of Exchange

d) Documents related to quality of goods

a) Phytosanitary Certificate b) GLOBALGAP Certification c) Health Certificate

e) Organic Certification

- Certificate indicating material produce is based on organic farming.

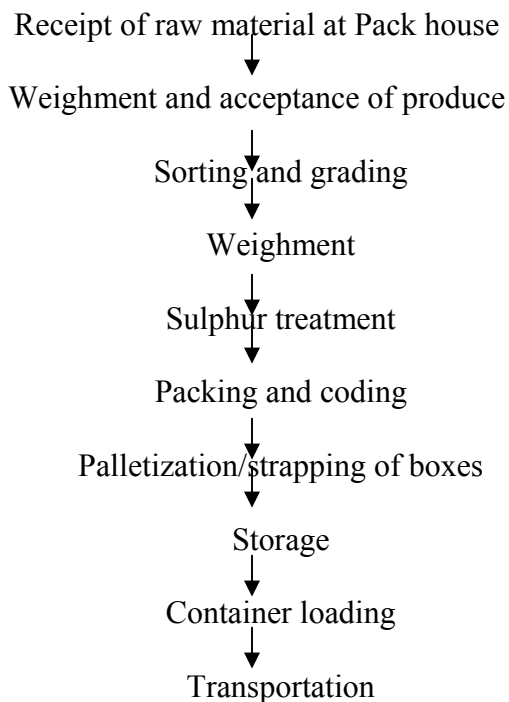
f) Documents related to Foreign Exchange Regulations

GR Form: Documents required by RBI which assures to RBI that the exporter will realize the proceeds of goods within 180 days from the date of Shipment.

g) Other Document

Bank Realization Certification (BRC): This is the advice given by Foreign Exchange Bank after the realization of money from Importer

15. Chain of events which happen up to shipment



16. Price prevailing in international market

Table 6.11: Summary of prices for litchi in target markets for India

Country	Annual Average price Range (2003-08)	
	Currency	
European Union*	USD/kg	1.27 to 2.74
	INR/kg	57.37 to 123.47

Source: Comtrade Database

* These prices are undervalued as these prices include other items like Rambhutan etc. However, personal communication from UK, the prices of litchi in EU varies from Rs. 250-285 per kg and in Dubai, the prices vary from Rs. 200-225 per kg.

17. Cost Calculation from harvest to packhouse to port

The cost involved in exporting litchi is as follows (as per information collected during 2008):

(a) Procurement price*:

Variety		Approx. price (in Rs./kg)
Shahi (Grade A)	:	55-60

*Price of litchis varies according to variety and month of procurement

(b) Charges for fumigation, packing, transport, etc.(below in table):

Table 6.12: Charges for fumigation, packing, transport, etc.

Particulars	Rs/kg
Charges for fumigation , pre cooling, cold storage	5.0
Packaging cost	12.0
Transportation to Mumbai Airport	15.0
Total	32.0

Source: Litchi Exporters Association, Nainital, Uttarakhand.

(c) Air freight charges*:

Freight rates for **reefer container** are as follows:

A. Air Freight Charges – London

INR/KG	Weight : All Weight Group		
DEL/ LON	+300	+500	+1000 Kgs
A/F	INR 70.00	INR 66.00	INR 60.00
Surcharge	INR 11.50	INR 11.50	INR 11.50

B. Air Freight Charges – Amsterdam

INR/KG	Weight : All Weight Group		
DEL/ AMS	+300	+500	+1000 Kgs
A/F	INR 75.00	INR 70.00	INR 66.00
Surcharge	INR 11.50	INR 11.50	INR 11.50

C. Air Freight Charges – Dubai

All Weight Group						
DEL/Dubai	+45	+100	+250	+300	+500	+1000
A/F (SCR General)	INR 74/Kg	INR 62/Kg	INR 50/Kg	INR 50/Kg	INR 42/Kg	INR 42/Kg
A/F (SCR 0006)			INR 40/Kg	INR 40/Kg	INR 40/Kg	INR 40/Kg
AWB	Rs. 750 per AWB					

D. Air Freight Charges – Doha

All Weight Group						
DEL/Doha	+45	+100	+250	+300	+500	+1000
A/F (SCR General)	INR 75/Kg	INR 65/Kg	INR 55/Kg	INR 55/Kg	INR 45/Kg	INR 45/Kg
A/F (SCR 0006)			INR 35/Kg	INR 35/Kg	INR 35/Kg	INR 35/Kg
AWB	Rs. 750 per AWB					

E. Air Freight Charges – Muscat

All Weight Group						
DEL/Muscat	+45	+100	+250	+300	+500	+1000
A/F (SCR General)	INR 75/Kg	INR 60/Kg	INR 50/Kg	INR 50/Kg	INR 45/Kg	INR 45/Kg
A/F (SCR 0006)			INR 35/Kg	INR 35/Kg	INR 35/Kg	INR 35/Kg
AWB	Rs. 750 per AWB					

F. Air Freight Charges – Singapore

All Weight Group						
DEL/Singapore	+45	+100	+250	+300	+500	+1000
A/F (SCR General)	INR 88/Kg	INR 63/Kg	INR 63/Kg	INR 44/Kg	INR 39/Kg	INR 39/Kg
AWB	Rs. 750 per AWB					

G. Air Freight Charges – Kuala Lumpur

All Weight Group						
DEL/ Kuala Lumpur	+45	+100	+250	+300	+500	+1000
A/F (SCR General)	INR 70/Kg	INR 63/Kg	INR 63/Kg	INR 55/Kg	INR 53/Kg	INR 53/Kg
A/F (SCR 0006)			INR 45/Kg	INR 45/Kg	INR 38/Kg	INR 38/Kg
AWB	Rs. 750 per AWB					

* It varies from year to year /season to season, capacity of container and distance covered.