

POST HARVEST PROFILE **OF** **CHILLI**



GOVERNMENT OF INDIA
MINISTRY OF AGRICULTURE
(DEPARTMENT OF AGRICULTURE &
COOPERATION)
DIRECTORATE OF MARKETING & INSPECTION
BRANCH HEAD OFFICE
NAGPUR
2009

MRIN-2

PREFACE

Chilli is considered as one of the most important commercial spice crops and is widely used universal spice, named as *wonder spice*. Different varieties are cultivated for varied uses like vegetable, pickles, spice and condiments. Chilli (botanically known as **Capsicum annum** L.; Capsicum **frutescens** L.), also called red pepper belongs to the genus capsicum, under the solanaceae family. It is believed to have originated in South America. Chillies are referred to as chillies, chile, hot peppers, bell peppers, red peppers, pod peppers, cayenne peppers, paprika, pimento, and capsicum in different parts of the world.

Chillies are integral and the most important ingredient in many different cuisines around the world as it adds pungency, taste, flavour and color to the dishes. Indian chilli is considered to be world famous for two important commercial qualities—its colour and pungency levels. Some varieties are famous for the red colour because of the pigment **Capsanthin** and others are known for biting pungency attributed to **capsaicin**. The other quality parameters in chilli are length, width and skin thickness.

Attempts have been made while preparing the Profile of chilli to give information on various aspects of Post Harvest Management, Marketing Functions and Services, Marketing Channels, Costs and Margins, alternative system of marketing and other related information.

The profile has been prepared by **Dr. Rajendra R. Karpate**, Marketing Officer, under the supervision and guidance of **Shri Rakesh Saxena**, Dy. Agricultural Marketing Adviser, Branch Head office, Nagpur with the overall guidance of Agricultural Marketing Adviser.

The technical assistance and cooperation extended by various Government and Semi Govt. Organizations, Research Centers under Indian Council of Agricultural Research, Trade Associations and the Regional and Sub-Offices of DMI is thankfully acknowledged.

The Government of India should not be regarded as assuming responsibility for any of the statements contained in this profile.

Faridabad

Dated the 12/11/2010

Sd/-
(Rajendra Kumar Tiwari)
Agricultural Marketing Adviser
to the Government of India

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POST HARVEST PROFILE OF CHILLI

1.0 INTRODUCTION

Chilli is one of the most important commercial crops of India. It is grown almost throughout the country. There are more than 400 different varieties of chillies found all over the world. It is also called as *hot pepper*, *cayenne pepper*, *sweet pepper*, *bell pepper*, etc.



Its botanical name is "*Capsicum annum*". The world's hottest chilli "**Naga Jolokia**" is cultivated in hilly terrain of Assam in a small town Tezpur, India. Different varieties are grown for vegetables, spices, condiments, sauces and pickles. Chilli occupies an important place in Indian diet. It is an indispensable item in the kitchen, as it is consumed daily as a condiment in one form or the other. Among the spices consumed per head, dried chilli fruits constitute a major share. Currently, chillies are used throughout the world as a spice and also in the making of beverages and medicines. If some varieties of

chillies are famous for red colour because of the pigment 'capsanthin,' others are known for biting pungency attributed to 'capsaicin.' India is the only country which is rich in many varieties with different quality factors. Chillies are rich in vitamins, especially in vitamin A and C. They are also packed with potassium, magnesium and iron. Chillies have long been used for pain relief as they are known to inhibit pain messengers, extracts of chilli peppers are used for alleviating the pain of arthritis, headaches, burns and neuralgia. It is also claimed that they have the power to boost immune system and lower cholesterol. They are also helpful in getting rid of parasites of gut.

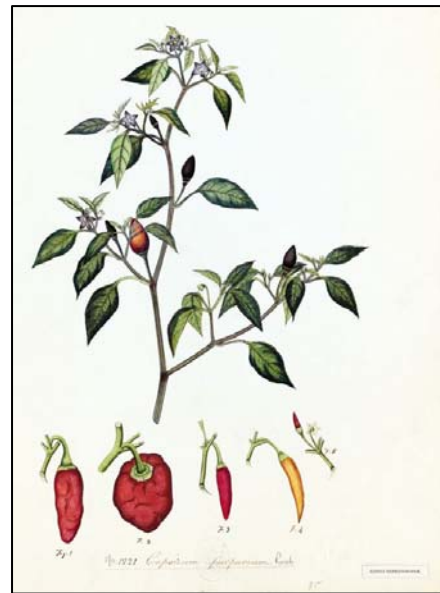
The fruit of chilli or *Capsicum* plants have a variety of names depending on place and type. It is commonly called chilli pepper, red or green pepper, or sweet pepper in Britain, and typically just capsicum in Australian and Indian English. The large mild form is called bell pepper in the US and Canada. It is called paprika in some other countries (although paprika can also refer to the powdered

spice made from various capsicum fruit). The original Mexican term, *chilli* (now *chile* in Mexico) came from the Nahuatl word *chilli* or *xilli*, referring to a larger *Capsicum* variety cultivated since 3000 BC, as evidenced by remains found in pottery from Puebla and Oaxaca. It is universally called by different names such as Pimenton, Puvre de Guinee, Filfil Ahmar, Paprika, Spaanse Peper, Peperone, Pimento, Struckkovy pyeret, Togarashi, Hesiung Yali chiao, Lal-mirch, etc.

In Indian subcontinent, chillies are produced throughout the year. Two crops are produced in kharif and rabi seasons in the country. Chilli grows best at 20–30°C. Growth and yields suffer when temperatures exceed 30°C or drops below 15°C for extended periods. The crop can be grown over a wide range of altitudes from sea level upto nearly 2100 meter.

1.1 ORIGIN :-

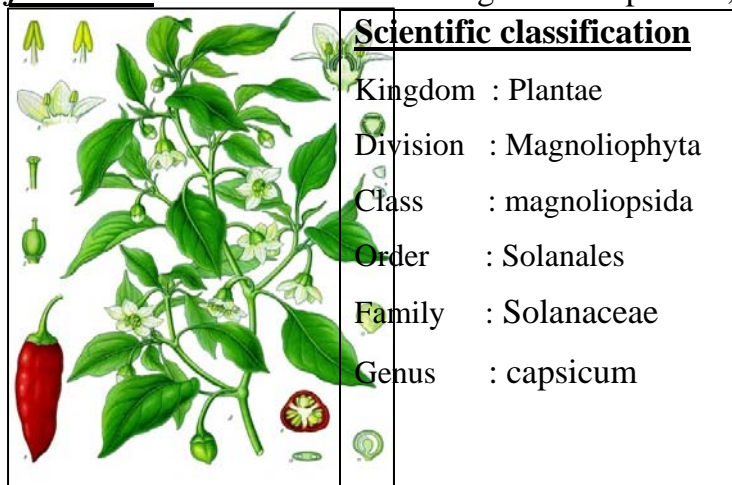
Chillies are known from pre-historic times in Peru. They are believed to have originated in the tropical America. It is also said that chillies have originated in the Latin American regions of the New Mexico and Guatemala as a wild crop around 7500BC, as per the remains of the pre-historic Peru. The people native to these places domesticated this crop in and around 5000 BC,. Chilli is said to be the first ever domesticated crop in America. The three species *C. annuum*, *C. frutescens* and *C. chinense* evolved from a common ancestor located in the North of the Amazon basin (NW-Brazil, Columbia). Further evolution brought *C. annuum* and *C. frutescens* to Central America, where they were finally domesticated (in México and Panamá, respectively), whereas *C. chinense* moved to the West and was first put to cultivation in Perú. Two other species were first cultivated in Western South America: *C. baccatum* in the Peruvian lowlands and *C. pubescens* at higher elevations, in the Andes (Perú, Bolivia, Ecuador). At that time, chillies were cultivated by the farmers together with a primary crop to protect the primary crop from any damage from birds. Columbus carried chilli seed to Spain in 1493. The cultivation of chilli and Capsicum spread rapidly from Spain to Europe. The Portuguese brought capsicum from Brazil to India during the year 1584. Chillies became popular in the whole of Asia rapidly and native Asians started cultivating this crop as well. The south Asian climate suited this crop, and since its introduction in the 16 century has been increasingly cultivated in south Asia. Chillies are the cheapest spices available in India and are eaten across all groups



of people. The most important chilli growing states in India are Andhra Pradesh, Maharashtra, Karnataka and Tamil Nadu, which together constitute nearly 75 per cent of the total area. Andhra Pradesh tops the list in dry chilli production followed by Tamil Nadu, Maharashtra, Orissa and Karnataka.

BOTANICAL DESCRIPTION:-

Chilli is a fruit of the plants 'Capsicum annum' and 'Capsicum frutescens' that come from the genus 'Capsicum,' belonging to the family of



'Solanaceae,' which also includes tomato and potato. Capsicum is derived from the Greek word "Kapsimo" meaning "to bite." Genus Capsicum is divided into three sections by Hunziker - Monotypic Tubocapsicum, Pseudoacnistus and Capsicum. All the species in the genus have n=12 except

C. ciliatum and C. scolnikianum which have n=13. genus Capsicum includes 22 wild species and three varieties as well as five domesticated species and their wild relatives. In general domesticated species have larger but fewer fruits than its wild counterparts though seed per plant is about the same.

Chilli Plant is an annual sub-herb and the fruits vary in shape, size, colour and degree of pungency. Capsicum plants are herbaceous or semi-woody annuals or perennials. The leaves are ovate, tapering to a sharp point, measuring up to 15 cm, dark green on the upper surface and pale green on the lower surface. The flowers are small, white and borne singly or in clusters of 2 or 3 in the axils of the leaves. The fruits are of diverse shapes and sizes depending upon the variety.

1.2 IMPORTANCE :-

Pungency in chilli is due to the alkaloid "capsaicin" contained in the pericarp and placenta of fruits, it produces mild to intense spice when eaten. Capsaicin is a potent inhibitor of substance P, a neuropeptide associated with inflammatory processes. The hotter the chili pepper, the more capsaicin it contains. The hottest varieties include Naga Jalokia, habañero and Scotch bonnet peppers. Jalapeños are next in their heat and capsaicin content, followed by the milder varieties, including Spanish pimentos, and Anaheim and Hungarian cherry peppers. Capsaicin is being studied as an effective treatment for sensory nerve fiber disorders, including pain associated with arthritis, psoriasis, and diabetic

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neuropathy. When animals injected with a substance that causes inflammatory arthritis were fed a diet that contained capsaicin, they had delayed onset of arthritis, and also significantly reduced paw inflammation.

NUTRITIONAL VALUE OF CHILLI

Parameters	Value {Per 100 gms}	
	<u>CHILLIES DRY</u>	<u>CHILLIES (GREEN)</u>
Moisture	10.000 gm	85.700 gm
Protein	15.000 gm	2.900 gm
Fat	6.200 gm	0.600 gm
Minerals	6.100 gm	1.000 gm
Fibre	30.200 gm	6.800 gm
Carbohydrates	31.600 gm	3.000 gm
Energy	246.000 K cal	29.000 K gm
Calcium	160.000 mg	30.000 mg
Phosphorus	370.000 mg	80.000 mg
Iron	2.300 mg	4.400 mg
Vitamins		
Carotene	345.000 µg	175.000 µg
Thiamine	0.930 mg	0.190 mg
Riboflavin	0.430 mg	0.390 mg
Niacin	9.500 mg	0.900 mg
Vitamin C	50.000 mg	111.000 mg
Minerals & Trace Elements		
Sodium	14.000 mg	--
Potassium	530.000 mg	--
Phytin Phosphorus	71.000 mg	7.000 mg
Magnesium	--	272.000 mg
Copper	--	1.400 mg
Manganese	--	1.380 mg
Molybdenum	--	0.070 mg
Zinc	--	1.780 mg

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Chromium	--	0.040 mg
Oxalic Acid	--	67.000 mg
<u>Caloric values</u>		
Chilli (Dry)		297
Chilli (Green)		229

Source : The National Institute of Nutrition, Hyderabad.

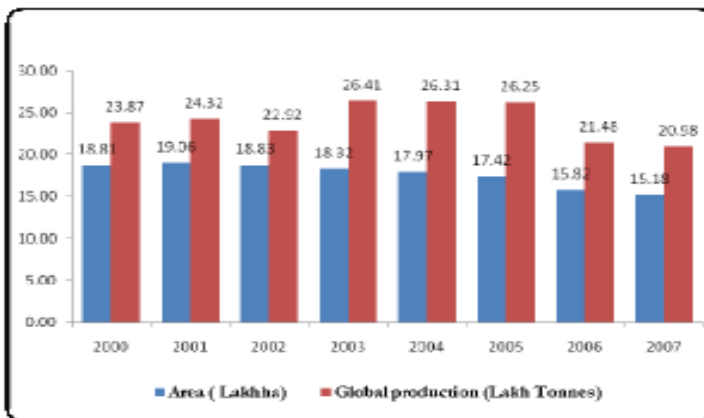
Fresh Chilli peppers are very rich in vitamin C: i.e. 111.0 mg. per 74 grams in comparison to only 37 mg. in oranges, which makes them very effective as immune system stimulants and healing agents especially for cellular damage. Many folk remedies recommend Chilli pepper in wound cleaning preparations for gangrene and open sores and even as a styptic, though more modern sources generally advise against using Chilli on broken skin. While drying, Chilli loses most of its vitamin C, it increases the vitamin A content by 100 times. Vitamin A is a powerful anti-oxidant and anti-inflammatory agent. Chilli preparations have been used as a gargle to treat sore throat and laryngitis. Surprisingly, it has been shown that Chillies do not aggravate or cause stomach ulcers. In fact, they have a preventative effect, as stomach ulcers are mostly caused by bacteria and its antibacterial action kills such bacteria. In folk-medicine they have also long been used to treat worms. Chilli has a very beneficial effect on the circulatory system. Studies have shown that it counteract on cholesterol build up and reduces platelet aggregation, thus reducing the risk of heart attacks and strokes. It also lowers high blood pressure and increase peripheral circulation.

2.0 PRODUCTION

2.1 MAJOR CHILLI PRODUCING COUNTRIES IN THE WORLD:-

Chilli is raised over an area of 1832 thousand hectares in the World, with a

World Area and Production



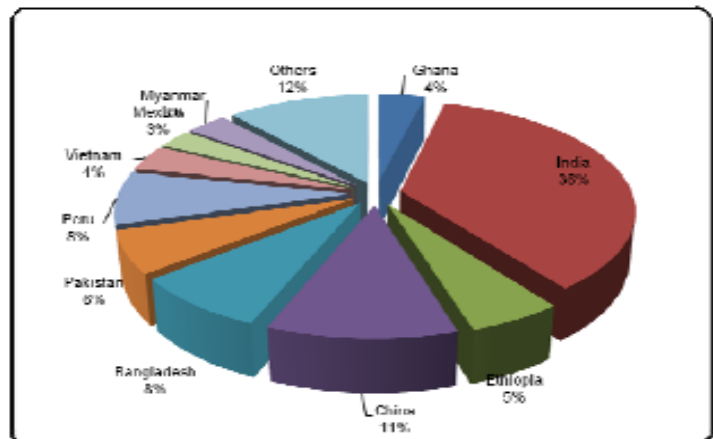
production of 2959 thousand tons. Major chilli growing countries are – India, China, Indonesia, Korea, Pakistan, Turkey and Sri Lanka in Asia; Nigeria, Ghana, Tunisia and Egypt in Africa; Mexico, United States of America in North – Central America; Yugoslavia, Spain,

Romania, Bulgaria, Italy and Hungary in Europe and Argentina and Peru in South America. India is the world (Source: FAO)

leader in chilli production followed by China and Pakistan. This shows that the bulk share of chilli production is in Asian countries, though it is

Countrywise

production . produced throughout the world. The top 10 chilli producing countries, India, China, Ethiopia, Myanmar, Mexico, Vietnam, Peru, Pakistan, Ghana and Bangladesh. accounted for more than 85% of the world production in 2009, The lion’s share is taken by India with 36% share in global



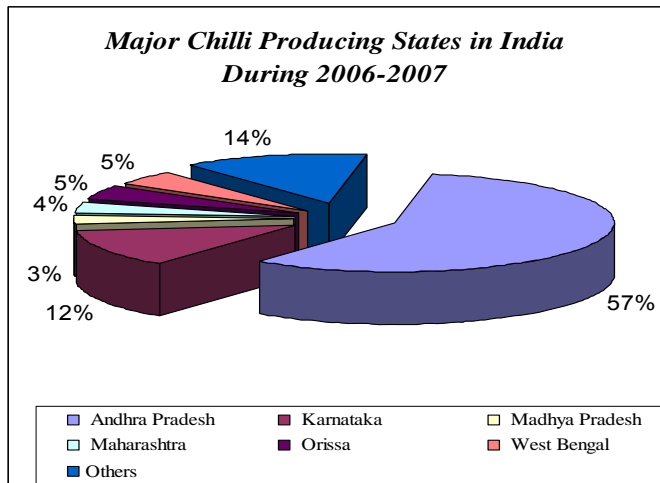
production, followed by China (11%), Bangladesh (8%), Peru (8%) and Pakistan (6%). India, the largest producer of chillies, is having annual

(Source : FAO) chilli production of around 14 lakh tonne, China with a production of around 4.5 lakh tons, Mexico with the production of around 4 lakh tons and Pakistan producing 3.5 lakh tons of chilli are other major producer of chillies.

2.2 MAJOR CHILLI PRODUCING STATES IN INDIA :

India is not only the largest producer but also the largest consumer of chilli in the world. Chillies are the most common spice cultivated in India. Chilli is a universal spice of India. It is cultivated in all the States and Union Territories of the country. India contributes about 36% to the total world production. In India, Chillies are grown in almost all the state through out the country. Andhra Pradesh is the largest producer of Chilli in India and contributes about 26% to the total area under Chilli, followed by Maharashtra (15%), Karnataka (11%), Orissa (11%), Madhya Pradesh (7%) and other states contributing nearly 22% to the total area under Chilli.

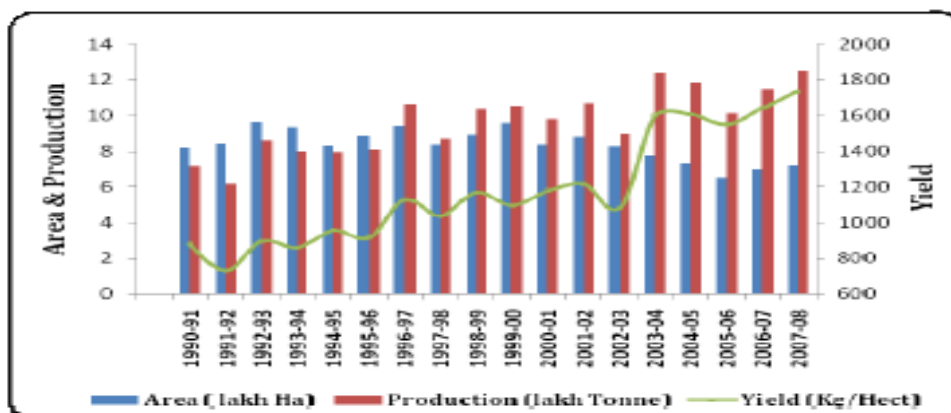
The production of Chilli in India is dominated by Andhra Pradesh which



contributes nearly 57% to the total production. Karnataka is the second largest producer contributing 12% to the total production followed by Orissa (5%), West Bengal(5%), Maharashtra (4%), Madhya Pradesh (3%)and others about 14% during 2006-07. The major chilly growing districts in Andhra Pradesh are Guntur, Warangal, Khammam, Krishna and Prakasham. Guntur is the

biggest chilli producing region, contributing 30% to the total production of AP with annual Source (Spice Board, India) turnover of around Rs.600 crore. Area and Production of Chilli in this area decides the prices at National level. Chilli production in India is moving northwards on increasing demand from diversified sectors and changing consumption patterns. Dry chilli production rose by nearly 43% from 8.7

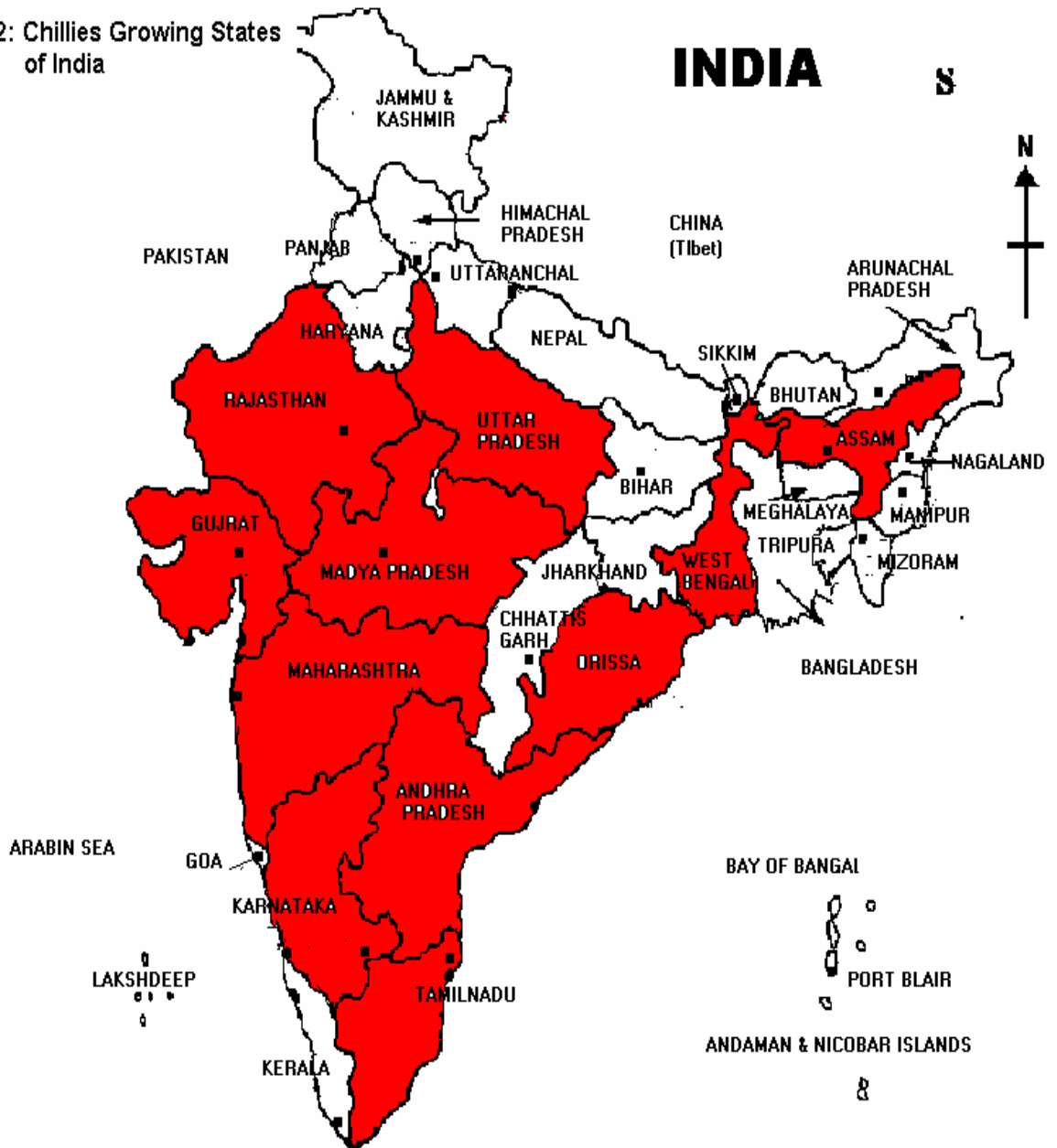
Growth of Chilli in India



Source(Spice Board, India)

lakh tonnes in 1997 - 98 to 12.5 lakh tonnes in 2007 - 08. India harvested a bumper crop from 1998 to 2001, with an average yield of 1174.25 kg/ha. Crop damage due to floods in major producing regions of South India, particularly in 2005 - 06, resulted in a sharp decline in production to 10.14 lakh tonnes. In 2007 - 08, the total acreage brought under chilli cultivation is around 7.2 lakh ha, an increase from last year's 7 lakh ha. Rising export demand coupled with higher price realization in the domestic market have motivated farmers to bring more area under chilli cultivation.

Chart 2: Chillies Growing States of India



2.3 ZONE-WISE MAJOR COMMERCIAL VARIETIES

Sl. No.	State	Variety
I SOUTH ZONE		
1	Andhra Pradesh	Jwala, X-235, G-1, G-2, G-3, G-4, G-5, LCA-205, 206, 235, Karakulu, Sannalu, Dippayerupu, Punasa, Maduru, Pottibudaga, Hybrid, Bharat, Aparna, Pottikayalu, Cullakayalu, Barak, Mota, Chapta, Desi Sindu, Kiran, Chikkaballapur (Lavangi), Sapota.
2.	Karnataka	Jwala, Bayadgi, G-1, G-2, G-3, G-4, G-5, Pusa Jwala
3.	Kerala	Jwala, Sadabahar, Champa, CO-1, Nandan, K-1
4.	Pondicherry	K-1, K-2, CO-1, CO-2
5.	Tamil Nadu	K-1, K-2, CO-1, CO-2, CO-3, PMK-1, PMK-2, Borma Wonder, Sannam, Palam
II NORTH ZONE		
6.	Bihar	Rori, Moti Mirchi, Chittee
7.	Haryana	NP-46-A, Pusa Jwala, Pusa Summer
8.	Himachal Pradesh	Solan Yellow, Hot Portugal, Pachad Yellow, Sweet Banana, Hungarian Wax, Punjab Lal
9.	Jammu & Kashmir	NP-46-A, Ratna Red, California Wonder
10.	Punjab	CH-1, Sanauri
11.	Uttar Pradesh	NP-46, Jwala Pant C-1, Desh, Pahadi, Kalyanpur, Chaman and Chanchal.
III EAST ZONE		
12.	Assam	NP64-Am Pusa Jwala, Surya Mukhi, Krishna, Balijuri
13.	Tripura	Jwala, Suryamukhi, Krisha, Balijwai
14.	West Bengal	Siti and Suti, Akashi, Kajari, Bow, Dhani, Bullet, Dhala.
IV WESTERN ZONE		
15.	Goa	Cacana, harmal, Tanvati, Lavangi
16.	Gujarat	K-2, Pant C-1, Jawahar-218, NP-46-A, Jwala.
17.	Rajashtan	CH-1, NP-46-A, Jwala, Pant C-1, G-3, G-5
IV CENTRAL ZONE		
18.	Madhya Pradesh	Pusa Jwala, Sona-21, Jawahar, Sadabahar, Agni.
19.	Maharashtra	Pathori, Bugayati, Dhobri, Black seed, Chaski, Bhiwapuri
20.	Orissa	Jwala, Deshi, Sadabahar.

3.0 POST HARVEST MANAGEMENT

Harvesting is done when the pods are well ripened and partially withered in the plant itself. The harvested pods are kept in heaps either indoor or in shade away from direct sun light for 2 or 3 days so as to develop uniform red colour and then dried in the sun by spreading them on clean dry polythene sheets, cemented / concrete drying yards etc. Pods are spread out in thin layers for uniform drying with frequent stirring to prevent mold growth and discolouration. The dried pods are heaped and covered by clean gunny bags / polythene sheets. The moisture content of dry pods are kept at 8- 10 %. Improved drying system could be used to ensure cleanliness and uniform colour of the product.

After removing the extraneous matters like plant parts, etc well dried pods should be packed in clean, dry gunny bags and stored ensuring protection from dampness. Dunnage should be provided to stack the packed bags to prevent moisture ingress from the floor. Care should be taken to stack the bags at 50 –60 cm away from the wall. Storing chillies for longer period may lead to deterioration. However, if cold storage facilities are used, the product may be stored for 8-10 months. Insects, rodents and other animals should be effectively prevented from getting access to the premises where chilli is stored.



Traditional Sun drying

- Chillies on harvesting have a moisture content of 65-80% depending on whether partially dried on the plant or harvested while still succulent, this must be reduced to 10% to prepare dried spice.
- Traditionally, this has been achieved by sun - drying of fruits immediately after harvesting without any special form of treatment.
- Sun drying even to day is the most widely used method in the world.
- Immediately after harvesting of fresh fruits, they are heaped indoors for 2 or 3 days, so that the partially ripe fruits if any are ripen fully and whole produce develops a uniform red colour.
- The best temperature for ripening is 22-25°C and direct sun light should be avoided which can cause development of white patches
- Heaped fruits then spread out in the sun on hard dry ground or on concrete floors or even on the flat roofs of houses. Frequent stirrings are given during day time in order to get uniform drying and thereby no discolouration or mould growth.
- The drying fruits are heaped and covered by tarpaulins or gunny bags during nights and spread during day time.

- After 2 or 3 days, the larger pods are flattened by trampling or rolling to facilitate subsequent packing into bags for storage and transport.
- Drying by this procedure takes 5-15 days depending on prevailing weather.
- Out of 100 kg of fresh fruits, 25-35kg of dried fruits may be obtained.
- Fresh produce dried on open spaces like roadsides and remain exposed to weather for the entire drying period (5-15 days) may cause contamination with dust and dirt, damaged by rainfall animals, birds and insects. The losses may range 70-80% of total quantity due to this method.
- Traditional method of harvesting and sun drying involved poor handling of fruits results in bruising and splitting.
- Bruising causes discoloured spots on pods, splitting leads to an excessive amount of loose seeds in a consignment, and there is a considerable loss in weight and then in price.
- If the harvested fruits are not properly dried and protected from rain and pests, it will loose the colour, glossiness and pungency.

Improved CFTRI method of sun - drying:

- CFTRI has developed a four - tier system of wire - mesh trays or a single tray of perforated Aluminium. It took 14 days in sun to dry fruits having a moisture content of 72 to 74% reducing it to about 6%, the traditional method of sun drying takes about 3 weeks to achieve a moisture level of 15-20%.

3.1 POST HARVEST LOSSES :-

The prime requisite for Capsicum species is harvesting them at the correct stage of maturity without much physical damage. Chilli like all other agricultural commodities invariably contains a high moisture content (60-85%) at the time of harvest, which must be brought down to 8-12% moisture. It is estimated that about 10% of foodgrains produced in India, are lost in processing and storage. The majority of Chilli produced are dried upon open space. The major loss was due to driage, which amounted for 20-15% of total weight of the pods

Estimated Post-Harvest Losses of Chilli at Producer's level

S.No.	Causes	Losses (Percentage of total production)
1.	Moisture	15-25%
2.	Spoilage in field	01-10%
3.	Farm to assembling	05-10%
4.	Assembling to distribution	2-5%

Source : Marketing of Chillies in India, 2002, D.M.I., Nagpur.

3.2 HARVESTING AND POST HARVEST CARE:-



- i) Harvesting should be done during early mornings, It should be avoided during rains or just after rains.
- ii) While harvesting fruits, care should be taken to hold stalks firmly and fruit should be pulled upward gently, breaking the base of the stalk.
- iii) For dry chillies, care should be taken that the fruit should not be ripened or over ripened.
- iv) The harvesting should not be delayed as delayed harvesting gives poor quality produce.
- v) The harvested fruits should be heaped indoor for 2-3 days, so that the partially ripe fruits, allows the whole produce to develop a uniform red colour.
- vi) The best temperature for ripening is 22-25° C and direct sunlight is to be avoided since this can result in development of white patches.
- vii) The ripen pods should be dried in the sun spreading them on clean dry polythene sheets, cemented drying yard.
- viii) The moisture content of dry pods should be kept at 8-10%
- ix) Reverting solar dryer are used for drying helps in reducing of drying time.



- x) Chillies should be stack at 50 to 60 cms. away from the wall.
- xi) Periodic fumigations during storage with methyl bromide and phosphine is useful to control insects.
- xii) The product should not be stored for longer period except in case of cold storage with moisture proof plastic liners (polythene bags) preferably between 0-10° C with 65 to 70 percent humidity.
- xiii) If possible while transporting from field, plastic field crates in places of sacks may be used to avoid mechanical damage.

3.3 GRADING :-

Grading is pre-requisite for development of the modern marketing, trade and economy of any commodity. The Indian chillies are graded mostly by farmers on the basis of colour and size, before they are brought in the market. The damaged discoloured and immature pods are removed depending on market demand. However, at traders level the other important quality parameter are moisture and stalks. Excess moisture add weight to the pods but give room to various fungi to grow. Similarly, if the stalk of the pods is broken, exposing the seeds entirely, the seeds may fall out. On the other hand in absence of optimum moisture the pods may break and let off the seeds. Thus the seed and pod ratio in a lot is also a valuable parameter of grade.

Apart from the apparent characters of colour, size, moisture and stalk of the pods, the following features also have weightage in grading chillies.

- a) Seed and fruit (pod) ratio
- b) Seed size and hardness
- c) Thickness of the skin of the pod and
- d) Pungency.

For different purposes, the varieties of chillies are chosen by the end user. End users are mainly of two types. Such as domestic retail users and industrial wholesale users. Industrial users who prepares Chilli powder gives preference for



colour-pungency, fleshy skin and less seeds. Whereas, the domestic users prefer all varieties for different occasions. There are several local and conventional grades followed by the farmers, village merchants and itinerant merchants. The visual assessment of grades by seeing the lots/heaps and by picking hand full of pods and analyzing them to enable the traders to adequate and assess the prices both in open and closed auction.

3.3.1 Grade Specifications :

Different specifications which have been notified by different agencies such as D.M.I., ASTA are given in Annexure – I, II.

3.3.2 Adulterants and Toxins :

Several types of adulteration are possible and have been reported at various times in chillies, Whole dried chillies may be adulterated by adding sub-standard darkened or bleached, dried fruits, by adding moisture to increase the weight of a load, or by coating with mineral oil or synthetic dyes such as coal tar red to improve the colour and appearance. A more difficult problem is the addition of varieties or harvests that vary in caps and colour but have similar shape, size, and visual colour.

Microbial contamination is also a problem in dried chilli. In addition, insect contamination can be a problem particularly the universal drugstore beetle *Stegobium paniceum* (Linn) and the cigarette beetle. *Lasiodenna serricorn* (Fab.). Insect damage is three fold, first by the physical loss as frass, second by the loss of quality due to broken pods and loose seed and third by mould growth and entry of mites due to insect holes in the fruit walls. Heavy metals and chemical residues from pesticides represent another contamination problem.

Toxins :

The main environmental pollutants in whole chilli are toxic trace metals from agronomic sources particularly agricultural, chemicals and processing operations. Some of the importance trace metals pollutants are Lead, Copper, Arsenic, Tin, Zinc, Cadmium, Mercury, Methyl mercury.

3.3.3 Grading At Producer's Level :

The produce that comes to regulated markets is generally well dried and cleaned as it fetches a premium price. Grading that is usually done at producer's level before bringing it to markets is sorting out discoloured, white and spoiled chillies at the time of its drying in order to get premium price when it is sold. At the regulated market, producers further grade chillies on the basis of variety, size, colour, taste, etc. Deep and bright red colour chillies and chillies with low seed content, generally fetch premium price. As regard pungency, size and shape, it depends on individual taste.

Grading with the object of conforming to fixed or definite standards has not developed well in our villages. Efforts to grade chillies at producer's level or commercial grading have been made by the Directorate of Marketing & Inspection. The scheme, "Grading at Producer level" was introduced in 1962-63 by D.M.I. The main objective of this scheme is to subject the produce to simple test & origin a grade before it is offered for sale. The programme is being implemented by the State Government, for which 2113 grading units were set up in the Country till 31.03.2008. During the year 2006-07 & 2007-08, about 13014.74 M.T. of chilli value at Rs.3651.41 lakhs were graded at producer level. Grading at producer's level is at present carried out mostly in Karnataka, Maharashtra and Andhra Pradesh.

Efforts so far made have induced producers to realize that they get higher prices for better quality when graded. Grading at producer's level need to be encouraged, in particular, at the regulated markets and co-operative marketing societies, so that good quality chillies are offered for sale, and benefit are accrued to buyers by getting desired good quality and sellers by getting premium price.

**STATEMENT/TABLES SHOWING DETAILS OF GRADING OF CHILLIES AT DIFFERENT LEVEL FOR PERIOD
2005-06, 2006-07 AND 2007-08 (STATE-WISE AND GRADING LEVELS)**

[Grading at producer's level (state-wise graded and its estimated value) for chillies]

Name of State	2005-06		2006-07		2007-08		No. of Grading units at producer's level		
	Qty. in M.T.	Value in Rs. lakh	Qty. in M.T.	Value in Rs. lakh	Qty. in M.T.	Value in Rs. lakh	2005-06	2006-07	2007-08
Andhra Pradesh	4143.40	1021.75	2771.60	617.14	2029.40	700.04	165**	30**	30**
Tamil Nadu	14345.90	3624.35	10243.10	4977.08	9602.40	2951.37	96**	96**	96**
Karnataka	-	-	-	-	-	-	-	-	44
TOTAL	18489.20	4646.10	13014.70	5594.22	11631.80	3651.41	261**	126**	170**

Source :- Directorate of Marketing & Inspection

STATEMENT SHOWING GRADING OF CHILLIES AT DIFFERENT LEVEL

Grading Type	2005-06		2006-07		2007-08	
	Qty. in M.T.	Value in Rs. lakh	Qty. in M.T.	Value in Rs. lakh	Qty. in M.T.	Value in Rs. lakh
Grading at producer's level	18489.20	4646.10	13014.70	5594.22	11631.80	3651.41
Grading under Agmark	64.34	18.17	22.60	12.61	24.90	11.52
Voluntary Grading	*	*	*	*	*	*
Compulsory Grading	*	*	*	*	*	*

Source :- Directorate of Marketing & Inspection

** It includes all the commodities under Producer's level, separate data is not available for chilli.

- Information not reported available.

3.4 PACKAGING :

Packaging is an important function for every produce and so is in marketing of Chilli. It is a practice to protect the produce from any damage during storage, transportation and other marketing aspects. It is required at every stage of marketing from the producer to the consumer. In recent years, packaging plays an important role in marketing of produce. Good packaging of chilli not only facilitates convenience in transportation and storage but also attracts consumer to pay more. The packaging reduces the marketing cost and protects the quality.

Packaging materials

The good packaging material must possess the following qualities:

- ✓ It must protect quality and quantity.
- ✓ It must prevent spoilage during transit and storage.
- ✓ It must tell information about quality, variety, date of packing, weight and price etc.
- ✓ It must be convenient in handling operations.
- ✓ It must be convenient to stack.
- ✓ It must be cheap, clean and attractive.
- ✓ It must be biodegradable.
- ✓ It must be free from adverse chemicals.
- ✓ It should be useful after the first use.

Method Of Packing :

In India Chillies are packed mostly in gunny bags and rarely in bamboo baskets



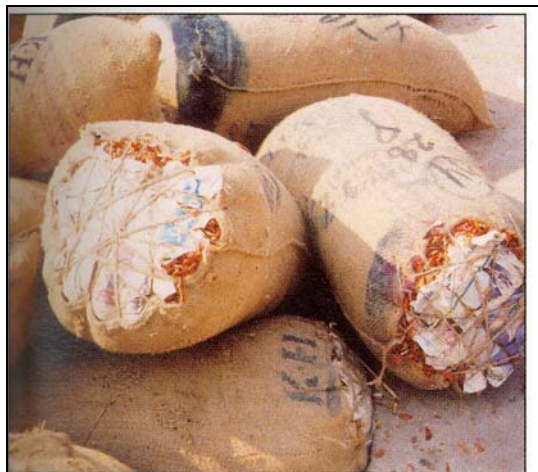
TRAMPLING PROCESS TO FILL THE BAGS

(North eastern states). It is found that there is no uniformity in the packing size of chillies in the country. Packing material used and the capacity of packages are different in different states. The capacity of gunny bags is generally 20-25 kgs. in North Eastern States and in Punjab. In Andhra Pradesh and Tamil Nadu, the pack size is more than 40 kg. & in Andhra Pradesh the pack size is even 100 kg. (Prakasam district). In case of basket packing the capacity is 20-30 kg. In Maharashtra Chillies are transported by the farmers in bulk on bullock carts with gunny cloth. Such packing is known as “GONT” with 400-500 kg. capacity.

Generally all the farmers use old gunny bags to pack chillies before selling. Only the exporters repack them into good new gunny bags and some times with polythene liner

inside. Chillies are also packed in polythene bags. In some states like Kerala, Maharashtra, Andhra Pradesh and Tamil Nadu, the pack size varies from district to district.

As per the capacity, the size of the bags also vary accordingly. Packing in 3000 gauge low density polyethylene film pouches are also done for 100 g. consumer unit packs to give a shelf – life of 3 to 6 months. Under tropical conditions, 200 – gauge low and high density polyethylene films are suitable for packing of whole chilli in units of 250 g. each. Such packs can be stored at a cool, dark, dry place for about a year.



USE OF PAPER TO CLOSE THE BAGS

3.5 TRANSPORTATION:

Transport is vital for the economic development of a country, since every commodity produced requires to be transport from producing area and distribution stages. Quick, cheap reliable and convenient mean of transport are essential for boosting production and trade.

Chillies are mainly transported in gunny bags (old or new) and some times in bamboo baskets. Transport of Chillies is broadly divided into two phases i.e. (i) from farm to Assembling Market and (ii) from assembling market to consuming markets/places. In the first phase, the producers and village/ itinerant merchants are involved and in the second phase wholesalers and processors are involved. Head loads, cartloads and tractor loads are generally used depending on the economic status and land holdings by the Chilli producers in the area. Of course, this does not have any bearing on the dispatches of chillies from the market places.

In Andhra Pradesh areas bordering Orissa, where Chilli producers are not economically well of and have small land holdings, the producers carry the produce to the market on their heads. Whereas, in Coastal Andhra, mostly farmers carry Chillies to the market by carts. In all other areas of the state the rich farmers use trucks and tractor/trolleys to carry Chillies to the markets. In case of dispatches from the markets, use of tractors was very less but trucks are the main transport vehicles. It is also noticed that Chillies are also being distributed by Rail, Bus and other modes of transportation. However common used mode of transport was tractor/truck.

In Assam most of the produce comes to the market as head loads and by pack animals or buses. Predominantly, Chillies are brought by the producers (50-70 per cent) as head loads. However, where bus facility is available and the markets are at a distance,

the produce is transported by buses. Pack animals are cheap and convenient mode of transport available to the farmers and village merchants. In case of wholesalers and processors, they use tractors and trucks. Bus and other modes are also in use in this state.

In Bihar it is reported that entire produce moves only by trucks and tractors both in first and second phase of marketing of Chillies. In Chandigarh the wholesalers use only trucks to transport the Chillies. In Goa also in both the phases, motor trucks and tractors were used with only 10 per cent being transported by bus and other modes in the second phase. In Gujarat, it was truck and trolley transport that dominate the first phase except in Panchmahal district where 50 per cent of the total arrivals come to market as head loads and on the back of pack animals in the first phase. Only 5-10 per cent despatches of Chillies are done by means other than truck and trolley. In Himachal Pradesh arrivals of Chillies to the regulated markets mostly come by head loads and pack animals. In plains, some arrivals are by truckloads. In the Second Phase, the movement of Chillies is mostly by trucks and buses. In case of Jammu & Kashmir, most of the arrivals are by head loads in the first phase and despatches by buses in the second phase.

In many markets of Kerala the movement of Chillies is by trucks and other modes in the second phase. In Madhya Pradesh, the producers and village merchants bring Chillies by truck/tractors while the whole salers dispatch them by trucks and rail. In Maharashtra, the produce comes to the market yards by carts and a small portion by trucks and tractors, except in Sangli, Dhule, Jalgaon and Chandapur where the wholesalers transport Chillies by trucks. In case of Orissa, headloads, pack animals and tractor/trucks are used in equal per centage.

In Union Territory of Pondicherry, 90 per cent of the produce was assembled by tractor/trucks while distribution was entirely done in the second phase by trucks. The farmers in Punjab assemble Chillies by trucks/tractor trolleys. The distribution was also more or less by tractors/trolleys. The wholesalers also used the rail and bus transport. In Rajasthan, in Jodhpur district which is one of the important Chilli growing area of India the farmers use tractors to assemble and wholesalers utilise truck service for distribution. In Tamil Nadu around 90-95 percent of the produce in the first phase was transported by tractor/trucks while the wholesalers use only Trucks to distribute Chillies. Only in Kolathur market of Salem district, the farmers use carts to reach the produce to the markets. In case of Uttar Pradesh arrivals were by head loads. In Badaun Market and in Bareilly and Orai it was by pack animals. Some of the small and marginal farmers use cycles to transport Chillies in Bareilly and Orai markets. In Aligarh, Gaziabad, Almora, Nainital and Lucknow the produce was brought to the market by tractors/trucks and tempos. The despatches by the wholesalers was mostly by trucks. Only in Jhansi, Orai and Jahanbad markets the despatches were by tractors. Bus tops are also used in many places. In Rampur market 70 per cent of the despatches were by other modes. In West Bengal the farmers mostly used cycle, van and rickshaws. In Midnapore and Murshidabad district the use of tractors/trucks was common. Mostly bus and railways were used to move Chillies to the consuming markets

Means of transportation used at different stages of marketing

Stage of Marketing	Agencies	Means of Transport Used
→ From field to the village market or primary market.	Farmers	By head load, pack animal, bullock or camel cart and tractor trolley.
→ From primary market to secondary whole sale market and miller	Traders / Millers	By trucks, railways.
→ From wholesale markets and miller to retailer	Millers / Retailers	By trucks, railways, mini trucks, tractor trolley.
→ From retailer to consumer	Consumers	By hand, bicycle, rickshaw.
→ For Export and Import	Exporters /Importers	By railways and ship

Availability of cheaper and convenient modes of Transport:

There are different modes of transport used in Chilli transportation. Road and Rail transport is normally used for internal markets; however, for export and import mainly Sea transport is used. The most common modes of transportation are

- 1) **Road Transportation:** Road transport is the most pre-dominant mode of transport used in the movement of chilli right from the producing fields to the ultimate consumer. The means of road transport are used in different parts of the country to transport chillies: are Head load, Cant, Tractor, Trolley, Bus etc.
- 2) **Railway :** Railway is one of the most important means of transportation of chillies. Railway is cheaper than road transport and it is more suitable for longer distance, as well as for large quantity. The tariff charges for the transport of chillies depends on distance, quantity, etc. Railway transportation requires more handling cost as it requires loading and unloading charges and local transportation cost.
- 3) **Water Transport:** It is the oldest and cheapest mode of transport. It includes river, canal and sea transport. However negligible quantity of chillies are transported through internal waterways. The export and import of chillies is mainly done by sea transport. This transport system is slow but cheap and suitable for carrying large quantity of chillies.

- **Selection of Mode of Transportation:**

Following points should be considered for the selection of mode of transportation:

- The mode of transportation should be cheaper among available alternatives.
- It should be convenient during loading and unloading of Chilli.
- It must protect Chilli during transportation from adverse weather conditions.
- It must deliver Chilli to consignee in stipulated period as the price changes every day.
- It should be easily available particularly during post harvest period.

MODE OF TRANSPORT

a) HEAD LOAD



d) TRUCK



b) TRACTOR TROLLEY



e) RAILWAYS



c) BULLOCK CARTS



f) WATER/SEA TRANSPORT



3.6 STORAGE

Storage is a very important component of marketing which has a direct impact on the prices. Adequate storage facilities will help in effectively distributing and marketing at all times and in all places. Storage function thus is responsible for balancing supply and demand situation.

In India, different states follow different methods of storage. In some states the chillies are stored in markets with the commission agents in their shops for 5 to 30 days. The farmer also stored chilli in the houses for about 5 to 15 days. The chillies are mostly stored in gunny bags by the producers, wholesaler and exporters for a period of 1 to 6 months depending upon the market conditions. In places like Orai chillies are stored by producers in earthen pots even for one year. In cities like Murshidabad & Jalpaiguri of West Bengal chillies are stored in Bamboo basket by the farmers in their own house.

The farm level storage capacity among the Chilli growers is not adequate in the country. Well maintained storage units in the market yards with low and uniform storage charges would encourage more farmers to store Chillies in the market places and improve their bargaining capacity.

3.6.1 Major storage pests and their control measures:

Dried chillies when stored are, often attacked by drugstore beetle. *Stegobium paniceum* (Linn) and the cigarette beetle *Lasioderma serricorne*. The *Artbrodeis* species also feed on chillies, though the loss caused by them is negligible. Spreading chillies in thin layers and exposing them to sunlight will eliminates the infection if infested by storage pest. If large quantities are infested with these pests, fumigation is the only remedy.

Lasioderma serricorne



Stegobium paniceum (Linn)



3.6.2 Storage Structures:

These facilities are used to store products, which can be any one of the following:

Containers: These may be gunny sacks, plastic bags, glass jars, or any other type of containers made of metallic slate, earthen pots, etc.

Open Spaces: This may be a drying floor, or any open space near the house, etc.

Shelves: These are any shelves in the house or barn, which can be used to place products for storage.

Underground Storage Chambers: These are chambers built underground either to save space or for other reasons, e.g. lower temperatures, ease in protection against rodents and birds, etc.

3.6.3 Storage Facilities

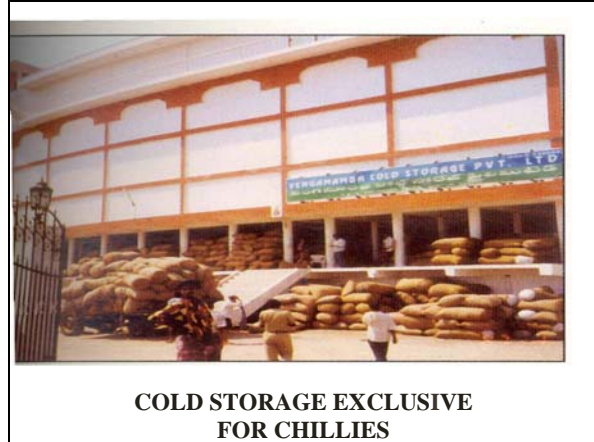
Storage facilities are of three types, namely

- (i) Farmer storage, /Producers storage
- (ii) Community storage (Rural Godowns/Mandi Godowns), and
- (iii) Commercial storage (Central warehousing/State Warehousing Corporations):

Farmer Storage: This is made up of locally available materials. The produce is stored in heaps on the ground for periods varying from a few days to a month or more after which it is transferred to temporary structures

Community Storage: These are storage facilities owned by farmers' cooperatives, farmer groups, or any other types of community establishments.

Commercial Storage: These are storage facilities owned by middlemen, millers, exporters, or manufacturers (of certain industrial products) for their own commercial benefit. Generally speaking, this type of storage is more modern than the first two types such as having better construction materials and layout, with fumigation facilities. The capacity is also much larger than the first two types. The use of broad-spectrum synthetic pesticides has been popularized and practiced in commercial storage facilities.



Commercial storage facilities mainly includes Rural Godowns, Mandi Gowdown, Central & State Warehousing corporation, etc.

3.6.4 Pledge Finance :

The Indian farming community consists mostly of small and marginal farmers. Micro level studies indicate that small farm holdings contribute about 54% of marketable surplus and distress sale by these small farmers account for about 50% of the marketable surplus. The farmers often sell their produce to square off their debts soon after harvesting. The solution for this problem lies in providing to them access to safe and scientific storage and easy marketing credit. The strategy should be promotion of pledge financing through a network of rural godowns and negotiable warehousing receipt system.

Limited credit for marketing of crops (pledge financing) is available at present to the farmers from the formal banking channels. The quantum of financing done both by Commercial banks and Cooperative banks for pledge financing is very small as compared to the crop production loans. The loans given for pledge financing also do not get captured in the existing monthly income scheme separately because the quantum is small and they get clubbed along with short- term direct agricultural loans for agriculture. NABARD has assessed the quantum of pledge financing which is taking place in the country now to be around Rs.1200 crores per year.

In some states, District Central Co-operative Banks (**DCCBs**) are directly financing individual farmers on the basis of pledge. In states like – Andhra Pradesh, Tamil Nadu, Bihar, Uttar Pradesh, Rajasthan and Haryana, the scheme of pledge finance is being operated by the Market Committees (APMCs). The pledge finance scheme for agricultural produce provided by the Agricultural Produce Market Committees in different states is given in Table No.

Benefits of the Pledge Finance

- ★ Prevent distress sale by producers.
- ★ Promotes cleaning, drying and grading at farm gate.
- ★ Promotes proper storage facilities.
- ★ Facilitates better price realization by farmers.
- ★ Avoids glut conditions in market.

Pledge Finance of Agricultural Produce – Grant of Advance by the Market Committees in different States / U.T(s)

1.	2.	3.
S	Name of State/Union Territory	Details of Pledge finance advance to Producers
1	Andhra Pradesh	A Scheme under Andhra Pradesh (Agril. Produce & Live Stock) Markets Act, 1966 provides advances against pledge to the producers. The advance is given to the extent of 75 per cent of the value of the produce pledged with the Market Committee subject to maximum limit of Rs.50,000/-. The pledge stocks may be sold within 90 days. The advance is free of interest for the first 90 days. Interest @ 6 per cent per annum is charged from the 91 st day till the date of disposal
2	Tamil Nadu	In order to avoid distress sales by the small and marginal farmers in the peak season, Regulated Markets are issuing pledge loan to farmers. Under this scheme, the farmers can store their agricultural produce in the godowns of Regulated Markets for a maximum period of 6 months and take pledge loan of 75% of the total value of the produce upto a maximum of Rs.1,00,000. Likewise Pledge Loan facilities are extended to traders also with the rate of interest specified from time to time. Interest at the rate 9% from traders is charged for pledge loan facilities.
3	Uttar Pradesh	A scheme of pledge-finance is being operated through Market Committees. According to the scheme, advance is given to the extent of 75 per cent of the value of the produce pledged with the market committee subject to maximum limit of Rs.5000/- and Rs.2500/- to small and marginal farmers respectively. The advance is free of interest for the first 30 days. Interest 6 per cent per annum is charged from 31 st day till the date of disposal. The Market Committee does not charge

		any godown rent for the first 7 days. From the 8 th day, the charges are 10 paise per bag per month or part thereof. The pledged stocks may be sold in 90 days.
4	Karnataka	The state of Karnataka has implements the pledge loan scheme through which the market committees are advancing loans against the pledge of agricultural commodities to the farmers. In fact, the market committees statutorily earmark 10 per cent of their annual income towards this scheme. This scheme was initiated on 01-04-1994 and it operates only in 132 markets of the state. During the time of fall in price, agriculturist can pledge their produce in the APMC godowns or warehouses and avail short-term loan to a maximum of Rs.50, 000/- or 60 per cent of the value of the agricultural produce whichever is lower for a period of 90 days. No interest is charged for the first 30 days, interest at the rate of 8 per cent and 12.5 per cent is charged for the next two successive 30 days period, respectively. The market committee is empowered to dispose off the produce after 90 days in case the farmer fails to repay the loan.
5	Maharashtra	Since 1990, the Maharashtra State Agriculture Marketing Board has implemented a scheme of pledge finance for the benefit of farmers of the State. The scheme of pledge finance is already popular among the farmers growing Moong, Tur, Urid, Soyabean, Paddy, Sunflower and Chana. From 2008-09 MSAMB has Expanded this scheme for Jawar, Bajra and Mage. This has safeguarded the interests of the farmers, who otherwise had no option but to sell at whatever low price, that is prevalent during peak harvest season. Under the scheme, the farmer is given a loan to an extent of 75% for the value of the produce prevailing in the market (for Jawar, Bajra and Maize 50% or Rs.300/- which is less), at an interest rate of 6% (well bellow the market rate). The farmer is allowed to avail this facility upto a period of 180 days. There are 36 APMCs who are actively participating in this scheme. So far in the year 2004-05 MSAMB has advanced Rs 15.30 crores as pledge finance under the scheme. This scheme has evoked good response from farmers of the Vidarbha and Maratwada region.
6	Rajasthan	The advance to the extent of 60 per cent of the value of the produce pledged with the Krishi Upaj Mandi Samities is paid subject to a maximum limit of Rs.15000/-. The advance attracts concessional rate of interest of 9 per cent for the first 60 days and 12 per cent for the next 90 days. Maximum duration of storage allowed under pledge scheme is of 150 days (5 months). The pledger is liable to pay the warehousing charges for the period his goods are stored in the godowns. The Krishi Upaj Mandi Samities have the right to sell the produce after five months from the date of storage of the stocks and thereafter through open auction. The Government of Rajasthan also operate schemes for ' <i>Pay-back</i> ', fee collection to small and marginal farmers and for free transport facility to small and marginal farmers for agricultural produce.
8	Haryana	The Scheme regarding pledge of agriculture produce is being

.		implemented by Haryana Government through Central Bank of India and Punjab National Bank. The Government is also thinking to associate the Cooperative Banks for granting advances to the farmers against warehouse receipts of Haryana Warehousing Corporation. The Haryana State Agriculture Marketing Board is not directly participating in the scheme.
.	9 Punjab	As regards schemes for granting loan to the farmers against their produce, the matter has been linked up with the mechanization of mandi operations. The scheme for partial mechanization of mandi operation is in vogue in 8 mandies on pilot project basis. Its extension alongwith provision of storage facility and grant of loans against such storage depends upon successful operation of mechanization programme.

4.0 MARKETING PRACTICES AND CONSTRAINTS

4.1 Assembling

Chillies are brought to the regulated markets in different parts of the country mostly by primary producers. Unlike the other perishable commodities, dry chillies are sold in the market by many producers in a phased manner. The producers try to get the best advantage of the prices. They store the produce as long as they can and bring to the market when prices are favourable to them. Only during glut the producer-seller come to the market with entire produce and try to dispose off the lots as quickly as possible because storing and selling may result in further loss due to crash in prices. The other agencies selling the produce in the market yard are village merchants, itinerant merchants wholesalers commission agents and cooperatives. Unfortunately, the role of cooperatives in bringing the Chillies into the market is very less. Only in Tamil Nadu it is reported that one per cent of the total arrivals in Thirunevelli and Kovipatti markets, chillies are brought by the local cooperative societies. The cooperatives were also active in Kozikode and Sangli markets of Kerala and Maharashtra States.

Andhra Pradesh, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Punjab Rajasthan, Tamil Nadu, Uttar Pradesh, West Bengal are the important states in the country in terms of production and market arrivals.

Major Assembling Markets:

Major markets of Chilli producing states

States	Important markets
Andhra Pradesh	Guntur, Warangal, Khammam, Krishna, Prakasham, Hyderabad, Pundur Nizamabad, Cuddpah, Rajamundry, Nellore, Srikakulam, Vijaynagaram, , Paddapallim, Eluru, Tadepalligudem, Pittapuram, Jagital and Prakasam.
Assam	Silchar, Kamarup, Guwahati, Barapeta, Karbi
Goa	Maragoan, Ponda, Mapua, sattri, bicholim
Karnataka	Dharwad, Mysore, Hasan, Bangalore, Bellary, Ranibennur, Hubli, Gadag, Byadgi
Madhya Pradesh	Indore, Khargone, Jabalpur, Katni, chindwara, Khandwa, Gwalior, Morena, Bhind, Bhopal
Maharashtra	Nagpur, Nasik, Ahmednagar, Sholapur, Aurangabad Nanded Lasalgaon Amravati, Dhulia, Chandrapur, JalgaonAnjangaon, Morshi, Dandaichi, Chimur, Amainer, Achalpur and Sangli.
Punjab	Amristar, Nabha, Patiala, Sunam
Rajasthan	Jodhpur, Ajmer, Bhilwara, Pali, Sikar, Bharatpur, Swaimadhampur
Tamil Nadu	Coimbatore, Ramanathapuram, Tuticorin, Tirunelveli, Virudunagar, Kanayakumari, Salem, Trichi, Villupuram, Cuddalore Pollachi, Arialur, Madurai, Theni, Podukottai, Pattukottai, Tanjaur, Pollachi, Thindivaram, and Virudhachalam.
Uttar Pradesh	Orai, Jhansi, Ramnagar, Ujhani, Lucknow Bareily, Khurja.
West Bengal	Coochbehar, Haldibari, Dinhata, Mathabhanga, 24 paraganas Gonheta, Amalgora, Salboni, Sat Bankura, Maynaguri, Falakata Dhupguri Dinajpur and Jhargram.
Orissa	Bhubaneswar, Jagat Singhapur, Cuttack, Jaleswar and Baripada.
Gujrat	Dahod, Jhalod, Gonded, Banankanta, Rajkot

4.1.1 Arrivals

Chillies arrive into markets mostly packed in gunny bags of 30-40 kgs. Farmers dry the chillies and store them in gunny bags. Generally the

produce is brought to markets in the peak season for sale. Arrival into the markets is largely influenced by prices. Wherever the information net work is adequate, farmers try to know the prevailing prices in the markets before disposing the goods. Arrivals are erratic during glut as the farmers try to hold the produce initially and when the prices start declining, they rush the produce to market for sale thereby further aggregating the situation. The Arrivals of 2004 – 2005 to 2006-2007 in major chilli producing states are given below.

Arrivals of Chillies in markets of major producing states in India

Sl. No.	Name of the states	Arrivals (in tonnes)		
		2004-2005	2005-2006	2006-2007
1.	Andhra Pradesh	537585	424266	267957
2.	Assam	16263	17031	17442
3.	Chandigarh	900	915	1000
4.	Gujrat	5542	4182	4146
5.	Jharkhand	81100	139200	103300
6.	Karnataka	928603	986560	769935
7.	Kerela	12600	12820	2610
8.	Madhya Pradesh	15704	39701	43482
9.	Maharashtra	2619600	1740200	2109500
10.	West Bengal	7362	7960	8252
11.	Goa	137	147	173

Source: Sub-offices of Directorate of Marketing and Inspection.

4.1.2 Despatches:

Chillies are mostly dispatched to the markets within the same state or to the markets of adjoining states. It is found that large quantity of chilli is mainly dispatched from Andhra Pradesh to other states, while in most of the other states it is observed that 90-95% of the total arrivals is consumed within the state only.

Dispatches from major Chilli producing states in India

States from where dispatched	States to which arrived
Andhra Pradesh	Tamilnadu, Maharashtra, Kerala, Delhi, West Bengal, Karnataka, Gujarat, Orissa,
Assam	Nagaland, Arunachal Pradesh, Rajasthan, Shillong, Meghalaya .

Chandigarh	About 90-95% of the total arrivals is consumed locally
Gujrat	Madhya Pradesh and Rajasthan
Jharkhand	total arrivals is consumed locally
Karnataka	Kerala, Tamilnadu, M.S., Delhi, Uttaranchal, Chattisgar and North Western States.
Kerela	Lakshdweep
Madhya Pradesh	Maharashtra, Delhi, Rajasthan and within State of M.P.
Maharashtra	Ahmedabad, Surat & Saurashtra Region of Gujarat State, Kolkata.
West Bengal	Total arrivals is consumed locally
Goa	Within State of Goa

Source: Sub-offices of Directorate of Marketing and Inspection.

4.2 Distrubution

Wholesale merchant plays an important role in distribution also. Wholesale merchant export most of the produce provide storage facilities to the farmers who want to store their produce. These wholesale merchants store the produce for some time to create demand in other markets. After getting good price they distribute the chillies.

The following agencies are involved in distribution of chilli at various stages of marketing

- * Producers
- * Pre-harvest contractors
- * Commission agents
- * Wholesale merchants
- * Retailers
- * Co-operative organisations
- * Government organisations
- * Exporters and importers

4.2.1 Inter-state movement:

Andhra Pradesh during the year 2004-2007, marketed about 40300, 32300, 26400 tonnes of chillies for the inter state movement. The states of Assam, Gujarat, Kerela, Madhya Pradesh, Maharashtra, Karnataka also marketed chillies

to different states. The interstate movement of chillies by rail, river and air during the period 2004-2007 is shown below.

Inter – state movement of chillies by rail, river and air

(2004-2005 to 2006-2007)

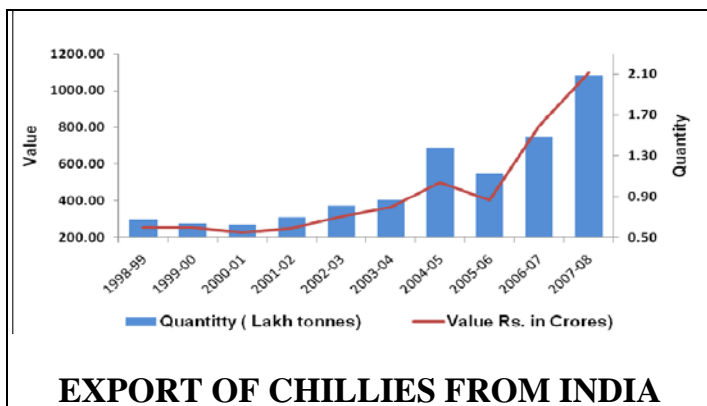
Sr.No	State	2004-2005	2005-2006	2006-2007
1.	Andhra Pradesh	40300	32300	26400
2.	Assam	332900	351500	370300
3.	Gujarat	3325	2508	2488
4.	Kerela	722	655	760
5.	Madhya Pradesh	55423	26304	34145
6.	Maharashtra	68766	62653	59605
7.	Karnataka	814536	882266	666561

Source: Sub-offices of Directorate of Marketing and Inspection.

4.3 Export and Import

Export:-

India has immense potential to export different types of chillies required by various markets around the world. It is the leader in export, with 25% share in world trade, followed by China with 24% share in total global export. Clearly, China is a serious competitor to India in the international markets, penetrating all major markets like Indonesia and the US. Indian chilli exports are mainly affected by domestic demand and uneven production which is due to erratic monsoon, drought, and yield factor. It is observe that India’s chilli exports are showing an



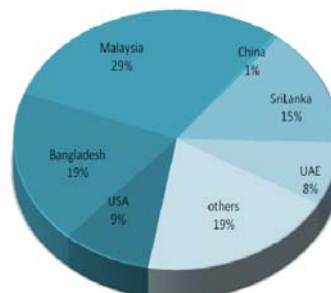
increasing trend from the last decade on rising export demand coupled with short supply from other major producing countries, and ban by the European Union on imports of chilli from Pakistan due to presence of aflatoxin in its produce. Pakistan’s export share in global trade has been grabbed by India that resulted

in historic high export from India in the last couple of years. Introduction of

sampling and mandatory quality **Source : Spice Board.**

testing of chilli and chilli-product consignments by the Spices Board before shipment for the presence of Sudan I – IV and aflatoxin has boosted the confidence of overseas buyers and helped India’s exports.

The rise in production of chilli during last few year and availability of large exportable surplus in the country coupled with lower crop expectation in other major producing nations boosted India’s export opportunities. India started exporting chilli in 1960-61, with 8,364 tonnes valued at Rs.176 crore. Since 2001-02, India’s export performance has been excellent, with higher international demand pushing exports to current levels. According to the Spices Board, the total export of chillies from India in 2007-08 touched a record high of 2.09 lakh tones, valued at 1097.59 crore, up 41.2%, against 1.48 lakh tones valued at 807 crore shipped 2006-07.



COUNTRYWISE EXPORT FROM INDIA

Source : Spice Board.

In 2007-08, India exported 16.4% of its total chilli production. The export of chilli accounts for 48% in terms of quantity and 28% in terms of value of the total export of spices from India. Currently, India is the main source of red chilli in the international market. It exports in different forms like chilli powder, dried chilli, pickled chillies and chilli oleoresins. Chillies consumed in the food processing industry are known for its colour and pungency, whereas countries like the US, the UK, Germany and Sweden use chilli for manufacture of oleoresins and extracts on a large scale.

In 2008-09, total chilli exports in the first quarter (April-June) rose 16.3% to 67,000 tonnes, compared with 57,625 tonnes last year due to strong demand from traditional buyers like Malaysia, Indonesia, Sri Lanka and Pakistan. Out of the total exports from India, Malaysia is the largest buyer of Indian chilli with a share of 29%, followed by other traditional buyers like Bangladesh (19%), Sri Lanka (15%), the US (9%), the UAE (8%) and others (19%).

Export of Chillies

YEAR	QUANTITY_TONNES	VALUE_RS_LAKHS
2000-2001	62448	22973.3

2001-2002	69997	25244.02
2002-2003	81021	31514.68
2003-2004	86575	36687.81
2004-2005	138073	49902.92
2005-2006	113174	40300.51
2006-2007	148500	80775
2007-2008	209000	109750
2008-2009	188000	108095

Source : Spice Board India.

Imports

In contrast to India's chilly exports, the country imports very small quantity of chilli

4.3.1 Sanitary And Phyto-Sanitary (Sps) Requirements:

In WTO agreement, protection of human safety or health, protection of animal and plant life or health and also protection of the environment is of prime importance, all these are broadly covered in **Sanitary and Phytosanitary (SPS) requirements**. The agreement on the application of **Sanitary and Phytosanitary Measures** is an integral part of final Act GATT 1994 (b) and of Agreement on Agriculture. SPS measures are defined as any measure applied in the following ways-

- (a) To protect animal or plant life or health within the territory of the member from risks arising from the entry, establishment or spread of pests, disease and disease carrying organisms;
- (b) To protect human or animal life or health within the territory of the member from risks arising from additives, contaminants, toxins or disease causing organisms on foods, beverages or feed stuffs;
- (c) To protect human life and health within the territory of the member from risks arising from the disease carried by animals, plants or products thereof, or from the entry, establishment or spread of pests; or
- (d) To prevent or limit other damages within the territory of the member from the entry, establishment or spread of the pests.

SPS measures include all laws decrees, regulation requirements and procedures including inter alia, end product criteria, process and production methods, testing, inspection certification and approval procedures, quarantine treatments including relevant requirements associated with the transport of

animals or plants or with the materials necessary for their survival during transportation, provisions on the relevant statistical methods, sampling procedures and methods of risk assessment and packaging and labelling requirements directly related to food safety.

These measures thus include food additives, contaminants, toxins, drug or pesticide residues in food, certificate of food, animal or plant health safety, processing methods, food labelling, plant or animal quarantine, requirement for prevention, control or establishment of pest or disease and sanitary requirements for imports. Where as the sanitary provisions relates to food and animal health, phytosanitary provisions relate to plant health aspects of products.

Phyto Sanitary Certification (PSC)

The phytosanitary certificate is an official declaration stating that plants and plant material that move across international boundaries are free from pests and diseases so as to prevent introduction and spread of any pests in the newer areas. PSC paves the way for rapid screening and expeditious release of imported plants/ plant material at the port of arrival. Under WTO agreement, its adoption has assumed greater significance.

4.3.2 Export Procedure:

To start with any export, one has to obtain Import-Export Code Number, issued by the office of the Director General of Foreign Trade. In all foreign trade as well as foreign exchange documentation mentioning of IE code number is a must.

In case of export/import of Spices/Spice products, Certificate of Registration as Exporter of Spices issued by the Board is also required in addition to the IE Code number. Spices Board issues Certificate of Registration as Exporter of Spices [CRES] under Section 11 of the Spices Board Act.

The documents to be furnished /formalities to be fulfilled for obtaining the Certificate of Registration as Exporter of chillies are as follows;

- » Application in the prescribed Form [Form-1]
- » Self attested copy of IE code certificate
- » Registration fee of Rs. 2000/- (Rupees two thousand only) in the form of crossed Demand Draft favouring “Spices Board”. The DD should be drawn on any scheduled Bank payable at “Ernakulam”.
- » Confidential Bank certificate in prescribed format in sealed cover from banker in support of account/financial status.
- » Self certified/attested copy of partnership Deed/Memorandum & Articles of Association as the case may be [not applicable to Proprietorship firm].
- » Self certified/attested copies of Sales Tax Registration (CST/VST/VAT) certificate.
- » Self attested copy of SSI certificate or the certificate issued by the Directorate of Industries in case of Manufacturer-exporter of spices.
- » Self certified copy of PAN card
- » Passport size photo preferably with white background of the CEO or the designated officer of your firm duly mentioning the name of the person and the company represented for issue of ID card.

4.4 MARKETING CONSTRAINTS:

- | | |
|--|--|
| i) Lack of marketing information | : Due to lack of market information regarding prices, arrivals etc., prevailing in other markets, producers sell chillies to the merchants. |
| ii) Adoption of grading | : Grading of Chillies ensures better prices to producers and better quality to consumers. However, most of the markets are lagging behind in providing grading service. |
| iii) Inadequate cold storage & Other facilities | : Due to inadequate cold storage facilities farmers are forced to sell their produce at lower rate. |
| iv) Training of producer | : The farmers are not properly trained in harvesting, transportation and marketing of Chillies. Training will improve their skill for better marketing of their produce. |
| v) Financial problem | : Lack of market finance is one of the major marketing constraints in operating of marketing chain. |

- vi) Infra-structure facilities** : Due to inadequate marketing infra-structural facilities with producers, traders and at market level, the marketing efficiency is affected adversely.

- viii) Inadequate processing units** : Due to the inadequate number and capacity of processing units, excess production during peak season is sold at distress rate or even gets perished at farm level.

5.0 MARKETING CHANNELS, COSTS AND MARGINS

Farmers producing agricultural produce are scattered in remote villages while consumers are in semi-urban and urban areas. The produce has to reach consumers for its final use and consumption. There are different agencies and functionaries through which this produce passes and reaches the consumer. A market channel or channel of distribution is therefore defined as a path traced in the direct or indirect transfer of title of a product as it moves from a producer to an ultimate consumer or industrial user. Thus, a channel of distribution of a product is the route taken by the ownership of goods as they move from the producer to the consumer or industrial user.

5.1 Marketing Channels:

Marketing channels have great influence on marketing costs which includes transport, commission charges, etc. and market margins received by the intermediaries such as trader, commission agent, wholesaler and retailer. Thus the price to be paid by the consumer and share of it received by the farmer producer is decided by the market channel involved. Channel is considered as good or efficient which makes the produce available to the consumer at the cheapest price and also ensures the highest share to the producer.

Following are the marketing channels through which Chillies are marketed in India:

Channel I :- Producer ▶ Village Merchant ▶ Middle Men ▶ Commission agent ▶ Whole seller ▶ Retailer ▶ Consumer

Channel II :- Producer ▶ Retailer ▶ Consumer

Channel III :- Producer ▶ Pre harvest contractor ▶ Wholesaler ▶ Retailer ▶ Consumer

Channel IV :- Producer ▶ Commission agent/ Wholesaler ▶ Retailer ▶ Consumer

Channel V :- Producer ▶ Commission agent ▶ Retailer ▶ Consumer

Criteria for selection of channels:

There are many marketing channels involved in marketing of chilli. The following are the criteria for the selection of efficient marketing channels.

- ▶ Channel which ensures reasonable return to producer,
- ▶ Transportation cost in the channel are minimized .
- ▶ Commission charges and market margins received by the intermediaries, such as trader, commission agent, wholesaler and retailer are relatively low.
- ▶ Short channel with minimum market cost.

5.2 Marketing Costs And Margins:

Marketing costs:

Marketing costs are the actual expenses incurred in bringing goods and services from the producers to the consumers. The marketing costs normally include;

- i) handling (Packaging) charges at local points,
- ii) assembling charges,
- iii) transport and storage costs,

- iv) handling charges by wholesalers and retailers, etc.
- v) expenses on secondary services like financing, risk taking and market intelligence,
- vi) Processing
- vii) Profit margins taken by different agencies.

Marketing margins:

Margin refers to the difference between the price paid and received by a specific marketing agency such as a single retailer, or by any type of marketing agency, i.e. retailers or wholesalers or by any combination of marketing agencies in the marketing system as a whole. The total marketing margin includes cost involved in moving the chillies from producer to consumer and profits of various market functionaries.



The absolute value of the total marketing margin varies from market to market, channel to channel and time to time. The marketing cost incurred by farmers and traders at regulated markets includes i) Market fee, ii) Commission, iii) Taxes, and iv) Other miscellaneous charges.

i) Market fee: Market fee is collected by the market committee of the market. It is charged either on the basis of weight or on the basis of the value of the produce. It is usually collected from the buyers. **The market fee differs from state to state. It varies from 1.0 per cent to 2.5 per cent.**

ii) Commission: It is paid to the commission agent, and may be payable either by seller or by the buyer or sometimes by both. The charge is usually made in cash and varies considerably.

iii) Taxes: Different taxes are charged in different markets such as toll tax, terminal tax, sales tax, octroi etc. These taxes differ from market to market in the same state as also from state to state. These taxes are usually payable by the seller.

iv) Miscellaneous charges: In addition to the above mentioned charges, some other charges are levied in markets. These include handling and weighment charges (weighing, loading, unloading, cleaning etc.), charity contribution in cash

and kind, grading charges, postage charges payable to water man, sweeper, chowkidar, etc. These charges may be payable either by the seller or by the buyers.

6.0 MARKETING INFORMATION AND EXTENSION

6.1 Marketing information:

Marketing information is important tool for decision making at all the stages right from farm production to ultimate consumption for all the participants in marketing channel. Marketing information is essential for producers in market

led production. It is equally important for other market participants for trading and also for consumers. Government of India has launched Agricultural Marketing Research and Information Network Scheme through Directorate of Marketing & Inspection (DMI) to bring out improvement in the present market information scenario by linking all Agricultural Produce Wholesale markets in the States and Union Territories in a phased manner. The data received from markets is being displayed on the website www.agmarknet.nic.in

6.2 Marketing extension:

Market extension is a vital service to enlighten the farmers about proper marketing and improving their awareness in various aspects of post-harvest management for efficient and cost effective marketing.

Benefits :

- ★ Provides the up-to-date information on the arrivals and prices of agricultural commodities of different markets.
- ★ Helps the producers to take right decision, when, where and how much to produce and market the same efficiently.
- ★ Educates the producers/traders about the post-harvest management i.e.
 - a) Harvesting care
 - b) Techniques to minimize losses during post-harvest period.
 - c) Value addition to the produce by proper cleaning, processing, packaging, storage and transportation.
- ★ Orients the producers/traders/consumers about price trends, demand and supply situation etc.
- ★ Orients the producer regarding the importance of grading, proper storage, co-operative/group marketing, direct marketing, contract farming, future trading etc.
- ★ Provides the information about the sources of credit availability, various Govt. schemes, policies, rules and regulations etc.

Sources:

The following are the sources of marketing information available in the country:

Source / Institution	Activities for marketing information and extension
<p>1. Directorate of Marketing and Inspection (DMI), NH-IV, CGO Complex, Faridabad. Website: www.agmarknet.nic.in</p>	<ul style="list-style-type: none"> ▶ Provides information through nationwide Marketing Information Network (“AGMARKNET” portal). ▶ Marketing extension through training to consumers, producers, graders, etc. ▶ Marketing research and surveys. <p>Publication of reports, pamphlets, leaflets, Agricultural Marketing journal, Agmark standards etc.</p>
<p>2. Spices Board (Ministry of Commerce & Industry, Govt. of India) 'Sugandha Bhavan" N.H.By Pass, Palarivattom.P.O Cochin – 682025, Kerala, India Phone : 91-484-2333610 - 616 Fax : 91-484-2334429, 2331429 Vedio Conferencing : 91-484- 2404092 E Mail: spicesboard@vsnl.com</p>	<ul style="list-style-type: none"> ▶ Promotion of exports of spices and spice products. ▶ Maintenance and monitoring of quality of exports. ▶ Development and implementation of better production methods, through scientific, technological and economic research. ▶ Guidance to farmers on getting higher and better quality yields though scientific agricultural practices. ▶ Provision of financial and material support to growers. ▶ Encouraging organic production and export of spices. ▶ Facilitating infrastructure for processing and value addition. ▶ Registration and licensing of all spice exporters. ▶ Assistance for studies and research on better processing practices, foolproof quality management systems, improved grading methods and effective packaging techniques. <p>Production of promotional and educative materials in a variety of media for the benefit of exporters and importers.</p>
<p>3. National Horticulture Board Ministry of Agriculture, Govt of India, 85, Institutional Area, Sector – 18 Gurgoan - 122015 (Haryana) Website : www.nhb.gov.in</p>	<ul style="list-style-type: none"> ▶ Provides market information on Horticultural crops ▶ Strengthen horticulture database

<p>4. Directorate of Economics and Statistics, Shastri Bhavan, New Delhi. Website: www.agricoop.nic.in</p>	<ul style="list-style-type: none"> ➤ Compilation of agricultural data on area, production and yield for development and planning. ➤ Dissemination of market intelligence through publication and Internet.
<p>5. Directorate General of Commercial Intelligence and Statistics (DGCIS), 1, Council House Street, Kolkata-1 Website: www.dgciskol.nic.in</p>	<ul style="list-style-type: none"> ➤ Collection, compilation and dissemination of marketing related data i.e. export-import data, inter state movement of food grains etc.
<p>6. Agricultural Produce Market Committees (APMC),</p>	<ul style="list-style-type: none"> ➤ Provide market information on arrivals, prevailing prices, despatches etc. ➤ Provide market information of adjoining / other market committees. ➤ Arranges training, tours, exhibitions etc.
<p>7. State Agricultural Marketing Boards, at different state capital</p>	<ul style="list-style-type: none"> ➤ Provide marketing related information to co-ordinate all the market committees in the state. ➤ Arrange seminars, workshops and exhibitions on subjects related to agricultural marketing. ➤ Provide training facilities to producers, traders and employees of the Boards.
<p>8. Federation of Indian Export Organisations (FIEO), PHQ House(3rd Floor) Opp. Asian Games, New Delhi- 110016</p>	<ul style="list-style-type: none"> ➤ Provide information to its members about latest developments of export and import. ➤ Organise seminars, workshops, presentations, tours, buyer-seller meets, sponsoring participation in international trade fairs, exhibitions and providing advisory services. ➤ Provide information about market development assistance schemes. ➤ Provide useful information on India's export and import with diverse database.
<p>9. Kisan Call Centers</p>	<ul style="list-style-type: none"> ➤ Provides expert advise to the farmers. ➤ These centers operate through toll free telecom lines throughout the country. ➤ A country-wide common four digit number 1551 has been allocated to these centers.

<p>10. Agricultural & Processed Food Products Export Development Authority (APEDA), NCUI Building 3, Siri Institutional Area, August Kranti Marg, New Delhi - 110 016 Website: www.apeda.com</p>	<ul style="list-style-type: none"> ➤ Provide Market Information Services for Horticulture Crops. ➤ Provide Horticulture Promotion Services. ➤ Provide information regarding export.
<p>11. Different websites on Agricultural Marketing Information</p>	<p>www.agmarknet.nic.in www.agricoop.nic.in www.nhb.gov.in www.ncdc.nic.in www.apeda.com www.mahagrapes.com www.icar.org.in www.fao.org www.agriculturalinformation.com www.kisan.net www.nic.in/eximpol www.nhm.nic.in www.mofpi.nic.in www.indiaagronet.com www.indianspices.com www.ficci.com www.cii.com</p>

7.0 ALTERNATIVE SYSTEMS OF MARKETING

Role of Government in managing markets is on decline worldwide. It is not easy to bring major changes in the traditional marketing system. The only way to modernize marketing is to promote alternative marketing system and that may operate parallel to and in addition to present marketing system. The purpose of the

proposed alternative marketing is to promote modern trade practices, which in turn will pave way for transparency and efficiency in market.

Various forms of alternate marketing like (a) direct marketing, (b) marketing through farmers interest group, (c) setting up of terminal markets, (d) forward and future market, (e) e-commerce, (f) setting up of mega markets, (g) negotiable warehouse receipt system etc. have been suggested by Expert Committee on Agricultural marketing headed by Shankarlal Guru

7.1 Direct Marketing:

Direct marketing is an innovative concept, which involves marketing of produce by the farmer directly to the consumers/processors without any middlemen. Direct marketing enables producers and processors and other bulk buyers to economize on transportation cost and improve price realization. It also provides incentive to large scale marketing companies i.e. processors and exporters to purchase directly from producing areas. Direct marketing by farmers to the consumers has been experimented in the country through *Apni Mandis* in Punjab and Haryana. The concept with certain improvements has been popularised in Andhra Pradesh through *Rythu Bazars*. In these markets, alongwith fruits and vegetables other commodities are marketed.

Benefits:

- ★ It increases profit of the producer.
- ★ It helps in market oriented production.
- ★ It helps in better marketing of chilli.
- ★ It minimizes marketing cost.
- ★ It encourages distribution efficiency.
- ★ It promotes employment to the producer.
- ★ Direct marketing enhances the consumer satisfaction-since the farmer bring the produce in a manner acceptable to consumer.
- ★ It provides better marketing techniques to producers.
- ★ It encourages direct contact between producers and consumers.
- ★ It encourages the farmers for retail sale of their produce.

7.2 Contract Farming:

Contract farming is a system of farming, where selected crop is grown for marketing by farmers under a 'buy-back' agreement with an agency (entrepreneur

or trader or processor or manufacturer). In the wake of economic liberalization, it has gained momentum as the national and multinational companies enter into contracts for marketing of agricultural produce. They also provide technical guidance, capital and input supply to contracted farmers. Contract farming ensures continuous supply of quality produce at pre-determined price to contracting agencies, as well as ensures timely marketing of the produce. Contract farming is beneficial to both the parties i.e. farmers and the contracting agencies.

Advantages to farmers: -

- ★ Price stability ensuring fair return of produce.
- ★ Assured marketing and free from involvement of middlemen.
- ★ Prompt and assured payments.
- ★ Proper production planning.
- ★ Technical advice in the field of production till harvesting.
- ★ Fair trade practices.
- ★ Credit facility.
- ★ Crop insurance.
- ★ Exposure to new technology and best practices.

Advantages to contracting agency: -

- ★ Assured supply of produce (raw materials).
- ★ Control on need based production/post-harvest handling.
- ★ Control on quality of produce.
- ★ Stability in price as per mutually agreed contract terms and conditions.
- ★ Opportunities to acquire and introduce desired varieties of crop.
- ★ Help in meeting specific customer needs/choice.
- ★ Better control on logistics.
- ★ Strengthen producer-buyer relationship.

7.3 Co-Operative Marketing:

“Co-operative marketing” is the system of marketing in which a group of producers join together and register them under respective State Co-operative Societies Act to market their produce jointly. The members also deal in a number of co-operative marketing activities i.e. purchasing of produce, grading, packing, processing, storage, transport, finance, etc. The co-operative marketing means selling of the member’s produce directly in the market, which fetches remunerative prices. Co-operative societies market the member’s produce collectively and secure advantages of economy of scale to its members. It also provides fair trade practices and protect against manipulations / malpractices. The

main objectives of co-operative marketing are to ensure remunerative prices to the producers, reduction in the cost of marketing and monopoly of traders.

7.4 Forward And Future Markets :

Forward and future markets are important tools of price stabilization and risk management. Extension of future markets to all major agro-commodities was reflected in the National Agricultural Policy of Government of India announced in the year 2002 and the budget speech of the Finance Minister (2002-2003)

Commodity future markets in the country are regulated under Forward Contracts (Regulation) Act, 1952. The Forward Markets Commission under provisions of Section-

3 of the Act performs advisory, monitoring, supervisory and regulatory functions in futures and forward trading. The exchanges are owned by the associations registered under the Act. At present, about 103 commodity exchanges are operating.

Broadly, three types of derivative transactions are being transacted **(i) Forward Contracts (a) Non-Transferable Specific Delivery Contract (NTSD) and (b) Transferable Specific Delivery Contract (TSD)**. The exchanges are specifically allowed for NTSD, forward contracts are not permitted. If the exchange is allowed for hedge contracts can not undertake NTSD / TSD, unless it is specifically permitted. Thus, there is compartmentalization between commodity exchanges and financial derivative exchanges. **(ii) Ready Delivery Contract** - In such cases, quality, quantity, place of delivery and time are standardized. Only, rate is negotiable. Delivery of goods and payment thereof is completed within eleven days of contract. Such contracts are outside the Act. **(iii) Option in Goods** – An agreement for the purchase of sale or a right to buy or sale. Options in goods are totally prohibited under the Act.

Benefits of Forward Marketing:

- ☞ **Price discovery mechanism** – Producer can get an idea of future pricing and thus select suitable beneficial commodities.
- ☞ **Price Risk Management** – It helps the exporter in quoting a realistic price and facility of hedging or insurance to producer or dealers
- ☞ **Price Stabilization** – In times of violent price fluctuation, future markets help in price stabilization

8.0 INSTITUTIONAL FACILITIES

8.1 Marketing Related Schemes Of Government / Public Sector:

Name of the scheme/implementing organisation	Facilities provided/salient features/ objectives
<p>1.Agricultural Marketing Information Network, Directorate of Marketing & Inspection, Head Office, N.H.-IV, Faridabad.</p>	<ul style="list-style-type: none"> ▶ To establish a nationwide information network for speedy collection and dissemination of market data for its efficient and timely utilization. ▶ To ensure flow of regular and reliable data to the producers, traders and consumers to derive maximum advantage out of their sales and purchases. ▶ To increase efficiency in marketing by effective improvement in the existing market information system. ▶ The scheme provided connectivity to 3026 nodes comprising the State Agricultural Marketing Department (SAMD) /Boards/ Markets. These concerned nodes have been provided with one computer and its peripherals. These SAMD/Boards/ Markets are to collect desired market information and pass on to respective state authorities and Head Office of the DMI for forward dissemination. The eligible markets will get 100 percent grant by Ministry of Agriculture.
<p>2. Spices Board (Ministry of Commerce & Industry, Govt. of India) 'Sugandha Bhavan" N.H.By Pass, Palarivattom.P.O Cochin - 682025 Kerala, India Phone : 91-484-2333610 - 616 Fax : 91-484-2334429, 2331429 Vedio Conferencing : 91-484-2404092 E Mail: spicesboard@vsnl.com</p>	<ul style="list-style-type: none"> ▶ Promotion of exports of spices and spice products. ▶ Maintenance and monitoring of quality of exports. ▶ Development and implementation of better production methods, through scientific, technological and economic research. ▶ Guidance to farmers on getting higher and better quality yields though scientific agricultural practices. ▶ Provision of financial and material support to growers. ▶ Encouraging organic production and export of spices. ▶ Facilitating infrastructure for processing and value addition. ▶ Registration and licensing of all spice exporters. ▶ Assistance for studies and research on better processing practices, foolproof quality management systems, improved grading methods and effective packaging techniques. ▶ Production of promotional and educative materials in a variety of media for the benefit of exporters and importers.
<p>3.Gramin Bhandaran Yojana</p>	<ul style="list-style-type: none"> ▶ It is a capital investment subsidy scheme for construction/renovation/expansion of rural godowns. The

<p>(Rural Godowns Scheme),</p> <p>Directorate of Marketing & Inspection, Head Office, N.H.-IV, Faridabad.</p>	<p>scheme is implemented by DMI in collaboration with NABARD and NCDC. The objectives of the scheme are to create scientific storage capacity with allied facilities in rural areas to meet the requirements of farmers for storing farm produce, processed farm produce, consumer articles and agricultural inputs.</p> <ul style="list-style-type: none"> ▶ To prevent distress sale immediately after harvest. ▶ To promote grading, standardization and quality control of agricultural produce to improve their marketability. ▶ To promote pledge financing and marketing credit to strengthen agricultural marketing in the country for the introduction of a national system of warehouse receipt in respect of agricultural commodities stored in such godowns. ▶ The entrepreneur will be free to construct godown at any place and of any size between 100 to 1000 MT except for restrictions that it would be outside the limits of Municipal Corporation area. In special condition, godowns upto the limits of 50 MT is also eligible for subsidy and in hilly region it may be 25MT. ▶ The scheme provides credit linked back-ended capital investment subsidy @15 percent of the project cost with a ceiling of Rs. 28.12 lakh per project and @ 25 percent of the project cost with a ceiling of Rs. 46.87 lakh per project. For the projects in North-Eastern states and hilly areas with altitude of more than 1000 m above mean sea level and to women farmer / their help groups/ cooperatives SC/ST entrepreneurs and their self help groups, maximum subsidy admissible is @ 33.33 percent of the project cost, with a ceiling of Rs. 62.50 lakhs.
<p>4. Scheme for development/ strengthening of agricultural marketing Infra-structure, grading & standardization,</p> <p>Directorate of Marketing and Inspection, Head Office, N.H.-IV, Faridabad.</p>	<ul style="list-style-type: none"> ▶ To provide additional agricultural marketing infra-structure to cope up with the expected marketable surplus of agricultural and allied commodities including dairy, poultry, fishery, livestock and minor forest produce. ▶ To promote competitive alternative agricultural marketing infrastructure by inducement of private and co-operative sector investments that sustain incentives for quality and enhanced productivity thereby improving farmers' income. ▶ To strengthen existing agricultural marketing infra-structure to enhance efficiency. ▶ To strengthen existing agricultural marketing infra-structure to enhance efficiency.

	<ul style="list-style-type: none"> ▶ To promote direct marketing so as to increase market efficiency through reduction in intermediaries and handling channels thus enhancing farmers income. ▶ To provide infra-structure facilities for grading, standardization and quality certification of agricultural produce so as to ensure price to the farmers commensurate with the quality of the produce. ▶ To promote grading, standardization and quality certification system to giving a major thrust for promotion of pledge financing and marketing credit, introduction of negotiable warehousing receipt system and promotion of forward and future markets so as to stabilize market system and increase farmers' income. ▶ To create general awareness and provide education and training to farmers, entrepreneurs and market functionaries on agricultural marketing including grading and quality certification. ▶ This is Reform linked investment scheme. Applicable only in such state/Union Territories, which undertake reforms in APMC Act to allow "Direct Marketing" "Contract Marketing" and to permit agricultural produce markets in "private and co operative sectors". ▶ The scheme provides credit linked back-ended subsidy @25 per cent of the capital cost of the project with a ceiling of Rs. 50.00 lakh per project. For the projects located in North-Eastern states, in the state of Uttarakhand, Himachal Pradesh, Jammu & Kashmir, hilly and tribal areas, and entrepreneurs belonging to SC/ST and their co project, with a ceiling of Rs. 60.00 lakhs.
<p>5. Agmark grading and standardization</p> <p>Directorate of Marketing & Inspection, Head Office, N.H.-IV, Faridabad.</p>	<ul style="list-style-type: none"> ▶ Promotion of grading of agricultural and allied commodities under Agricultural Produce (Grading & Marking) Act.1937. ▶ Agmark specifications for agricultural commodities have been framed based on their intrinsic quality. Food safety factors are being incorporated in the standards to compete in the world trade. Standards are being harmonised with international standards keeping in view the WTO requirements. Certification of agricultural commodities is carried out for the benefit of producer and consumer.
<p>6. Capital Investment</p>	<ul style="list-style-type: none"> ▶ To promote setting up of cold storages in the country for reducing post harvest losses.

<p>Subsidy for Construction / Modernization Expansion of Cold Storage and Storage's for 7. Horticulture Produce</p> <p>National Horticultural Board, 85, Institutional Area, Sector – 18 Gurgoan - 122015 (Haryana) Website : www.nhb.gov.in</p>	<ul style="list-style-type: none"> ▶ Creation and modernization/rehabilitation of cold storages. ▶ Pattern of Assistance: The assistance will be as credit linked back-ended subsidy @ 40% of the capital cost of project in general areas and 55% in case of Hilly and Schedule Areas for a maximum storage capacity of 5000MT per project
<p>8. Development of commercial Horticulture through Production and Post-Harvest Management,</p> <p>National Horticulture Board,85, Institutional Area,Sector – 18 Gurgoan - 122015 Website : www.nhb.gov.in</p>	<ul style="list-style-type: none"> ▶ To develop post-harvest management infrastructure; ▶ To develop high quality horticultural farms in identified belts. ▶ To improve linkages between horticulture producers and marketers ▶ To create integrated network for marketing of horticulture produce ▶ To increase producer’s share in consumer price ▶ To encourage networking of schemes for resource mobilization with all other related agencies/organizations
<p>9. Schemes for Infrastructure Development, Agricultural & Processed Food Products Export Development Authority (APEDA),</p> <p>NCUI Building 3, Siri Institutional Area, August Kranti Marg, New Delhi - 110 016 Website:</p>	<ul style="list-style-type: none"> ▶ Establishment of common infrastructure facilities. ▶ Assistance for purchase of specialised transport units for animal products horticulture and floriculture sector. ▶ Assistance to exporters / producers / growers / Cooperative organization and federations for horticulture and floriculture sector for : <ul style="list-style-type: none"> i) Mechanisation of harvest operation of the produce. ii) Setting up of sheds for intermediate storage and grading / storage / cleaning operation of produce. iii) Setting up of mechanized handling facilities including sorting, grading, washing, waxing, ripening, packaging &

<p>www.apeda.com</p>	<p>palletisation etc.</p> <p>iv) Setting up of both pre cooling facilities with proper handling system as well as cold storage for storing.</p> <p>v) Providing facilities for preshipment treatment such as fumigation, X-ray screening, hot water dip treatment, Water softening Plant.</p> <p>vi) Setting up of integrated post harvest-handling system (pack houses / green houses with any two or more of the above facilities).</p> <p>vii) Setting up of specialised storage facilities such as high humidity cold storage deep freezers, controlled atmosphere (CA) or modified atmosphere (MA) storage etc.</p>
<p>10.Schemes for Market Development, Agricultural & Processed Food Products Export Development Authority (APEDA), NCUI Building 3, Siri Institutional Area, August Kranti Marg, New Delhi - 110 016 Website: www.apeda.com</p>	<ul style="list-style-type: none"> ▶ Development of packaging standards and design. ▶ Up-gradation of already developed packing standards. ▶ Assistance to exporters for use of packaging material. ▶ Development and dissemination of market information with base on products, infrastructure etc. ▶ Assistance for conducting surveys, feasibility studies etc.
<p>11. National Horticulture Mission Govt. of India Ministry of Agriculture Department of Agriculture & Cooperation New Delhi</p> <p>http://nhm.nic.in/</p>	<ul style="list-style-type: none"> ▶ To provide holistic growth of the horticulture sector through an area based regionally differentiated strategies which include research, technology promotion, extension, post harvest management, processing and marketing, in consonance with comparative advantage of each State/region and its diverse agro-climatic feature. ▶ To enhance horticulture production, improve nutritional security and income support to farm households. ▶ To establish convergence and synergy among multiple on-going and planned programmes for horticulture development. ▶ To promote, develop and disseminate technologies, through a seamless blend of traditional wisdom and modern scientific knowledge. ▶ To create opportunities for employment generation for skilled

	and unskilled persons, especially unemployed youth.
<p>12. Scheme of technology mission for integrated development of horticulture in North Eastern states Jammu & Kashmir, Himachal Pradesh and Uttarakhand (TMNE) Government of India Ministry of Agriculture Department of Agriculture & Cooperation (Horticulture Division) Krishi Bhawan, New Delhi</p> <p>www.dacnet.nic.in/techmissionscheme</p>	<ul style="list-style-type: none"> ▶ To ensure adequate, appropriate, timely and concurrent attention to all the links in the production, post-harvest management and consumption chain in North Eastern states including Sikkim. ▶ To maximise economic, ecological and social benefits from the existing investments and infrastructure created for horticulture development. ▶ To promote ecologically sustainable intensification, economically desirable diversification and skilled employment to generate value addition. ▶ To promote the development and dissemination of eco-technologies based on the blending of the traditional wisdom and technology with frontier knowledge such as biotechnology, information technology and space technology. ▶ To provide the missing links in ongoing horticulture development projects. <p><u>The Technology Mission have four Mini Missions:</u></p> <p>i) Mini Mission-I: Research: Coordinated and implemented by ICAR.</p> <p>ii) Mini Mission-II: Production and Productivity: Coordinated by DAC and implemented by the Agriculture / Horticulture Departments of the States.</p> <p>iii) Mini Mission-III: Post-harvest management, marketing and export: Coordinated by DAC and implemented by NHB, DMI, NCDC, NAFED and APEDA.</p> <p>iv) Mini Mission-IV: Processing: Coordinated and implemented by MFPI.</p>
<p>13. National Agriculture Development Programme- Rashtriya Krishi Vikas Yojana (RKVY) Government of India Ministry of Agriculture Department of Agriculture & Cooperation</p>	<ul style="list-style-type: none"> ▶ To incentivise the states so as to increase public investment in Agriculture and allied sectors. ▶ To provide flexibility and autonomy to states in the process of planning and executing Agriculture and allied sector schemes. ▶ To ensure the preparation of agriculture plans for the districts and the states based on agro-climatic conditions, availability of technology and natural resources. ▶ To ensure that the local needs/crops/priorities are better reflected in the agricultural plans of the states. ▶ To achieve the goal of reducing the yield gaps in important crops, through focussed interventions.

<p>Krishi Bhawan, New Delhi http://india.gov.in</p>	<ul style="list-style-type: none"> ▶ To maximize returns to the farmers in Agriculture and allied sectors. ▶ To bring about quantifiable changes in the production and productivity of various components of Agriculture and allied sectors.
<p>13.(i)Scheme for Infrastructure Development Ministry of Food Processing Industries, Ministry of Food Processing Industries, Panchsheel Bhavan, August Kranti Marg, New Delhi-110 049 Website: www.mofpi.nic.in</p>	<p>To provide financial assistance for development of facilities like common processing, cold storage, food testing and analysis laboratory, effluent treatment plant, power, water etc. in Food Park, Packaging Centre, Integrated Cold Chain, Value Added Centre, Irradiation Facilities.</p>
<p>13(ii)Scheme for Technology Upgradation /Establishment /Modernization of Food Processing Industries</p>	<p>To provide financial assistance for the cost of plant and machinery/TCW.</p>
<p>13(iii)Scheme for Quality Assurance, Codex Standards and Research & Development</p>	<p>Financial assistance for Setting Up/ Upgradation of Quality Control/ Food Testing Laboratory for implementation of Hazard Analysis and Critical Control Points (HACCP), ISO 9000, ISO14000, Good Manufacturing Practices (GMP) and Good Hygienic Practices (GHP) for Total Quality Management, Bar Coding, Codex Standards Research and Development in Processed Food Sector.</p>
<p>13 (iv)Scheme for Backward and Forward Integration and other Promotional Activities</p>	<p>Backward Linkage-To increase capacity utilization of Food Processing Industry by ensuring regular supply of raw material through contract farming. Forward Integration-To increase capacity utilization of Food Processing Units by ensuring regular market for their products by establishing linkages with the market. Promotional Activities- To build awareness among the consumers about the advantages of processed food and their quality assurance mechanism. Dissemination of information about the processed food industry through publications, journals, press advertisements. Financial assistance for seminars/workshops /symposiums, studies/ surveys/ feasibility reports to assess the potential and other relevant aspects of Food Processing Industries.</p>

8.2 Institutional Credit Facilities:

Institutional credit facilities are the vital factor in agricultural development. The main emphasis is laid down on adequate and timely credit support to the farmers, particularly small and marginal farmers for encouraging adoption of modern technology and improved agricultural practices.

The institutional credit to agriculture is offered in the form of short term, medium term and long term credit facilities:

Short term and medium term loans:

Name of scheme	Eligibility	Objective/Facilities
1. Crop Loan	All categories of farmers.	<ul style="list-style-type: none"> ➤ To meet cultivation expenses for various crops as short term loan. ➤ This loan is extended in the form of direct finance to farmers with a repayment period not exceeding 18 months.
2. Produce Marketing Loan (PML)	All categories of farmers.	<ul style="list-style-type: none"> ➤ This loan is given to help farmers to store produce on their own to avoid distress sale. ➤ This loan also facilitates immediate renewal of crop loans for next crop. ➤ The repayment period of the loan does not exceed 6 months.
3. Kisan Credit Card Scheme	All agriculture clients having good track record for the last two years.	<ul style="list-style-type: none"> ➤ This card provides running account facilities to farmers to meet their production credit and contingency needs. ➤ The scheme follows simplified procedures to enable the farmers to avail the crop loans as and when they need. ➤ The credit limit under the card may be fixed on the basis of the operational land holding, cropping pattern and the scale of finance by the District Level Technical Committee (DLTC) and SLTC. If the limit has not been fixed by the DLTC/SLTC or the limit in the opinion of the bank is low, appropriate scale of finance for the crop may be fixed by the bank. ➤ Withdrawals can be made by using easy and convenient withdrawal slips. The Kisan Credit Card is valid for 3 years subject to annual review.

		<ul style="list-style-type: none"> ➤ It also covers personal insurance against death or permanent disability; a maximum amount of Rs. 50,000 and Rs. 25,000 respectively.
4. Modified National Agricultural Insurance Scheme	Scheme is available to all farmers – loanee and non-loanee both-irrespective of the size of their holding.	<ul style="list-style-type: none"> ➤ To provide insurance coverage and financial support to the farmers in the event of failure of any of the notified crops as a result of natural calamities, pests and diseases attack. ➤ To encourage the farmers to adopt progressive farming practices, high value in-puts and higher technology in agriculture. ➤ To stabilize farm incomes, particularly in disaster year. ➤ General Insurance Cooperation of India (GIC) is the Implementing Agency,. ➤ Sum insured may extend to the value of threshold yield of the area insured. ➤ Provides subsidy of 50 percent in premium of small and marginal farmers. The subsidy will be phased out over a period of 5 years on sunset basis. ➤ On account payment upto 25% of likely claims would be released as advance for providing immediate relief to farmers. ➤ More proficient basis for calculation of threshold yield and minimum indemnity level of 70% instead of 60% ➤ Modified NAIS with improved features will have two components i.e. compulsory and voluntary. Loaner farmers will be insured under ‘compulsory category’ while non-loaner farmers will be insured under ‘voluntary category’ ➤ Private sector insurers with adequate infrastructure and experience would be allowed in the implementation of MNALS.

Long term loans:

Name of scheme	Eligibility	Objective/Facilities
Agricultural Term Loan	All categories of farmers (small/medium and agricultural labourers) are eligible, provided they have necessary experience in the activity and required area.	<ul style="list-style-type: none"> ➤ The banks extend this loan to farmers to create assets facilitating crop production/income generation. ➤ Activities covered under this scheme are land development, minor irrigation, farm mechanization, plantation and horticulture, dairying, poultry, sericulture, dry land / waste land development schemes etc. ➤ This loan is offered in the form of direct finance to farmers with a repayment span not less than 3 years and not exceeding 15 years.

8.3 Organisations / Agencies Providing Marketing Services:

Name of the organisation and address	Services provided
<p>1. Directorate of Marketing and Inspection (DMI)</p> <p>NH-IV, CGO Complex Faridabad</p> <p>Website: www.agmarknet.nic.in</p>	<ul style="list-style-type: none"> ➤ To integrate development of marketing of agricultural and allied produce in the country. ➤ Promotion of standardization and grading of agricultural and allied produce. ➤ Market development through regulation, planning and designing of physical markets. ➤ Promotion of cold storage. ➤ Promotion of rural godowns and market infrastructure. ➤ Training of personnel in agricultural marketing. ➤ Undertakes extension and publicity activities to educate producers, traders and consumers. ➤ Providing agricultural marketing information. ➤ Liaison between the Central and State Governments through its regional offices (11) and sub-offices (26) spread all over the country.
<p>2. Agricultural and Processed Food Products Export Development Authority (APEDA)</p> <p>NCUI Building, 3, Siri Institutional Area, August Kranti Marg, New Delhi-110016</p> <p>Website: www.apeda.com</p>	<ul style="list-style-type: none"> ➤ Development of scheduled agriculture products related industries for export. ➤ Provides financial assistance to these industries for conducting surveys, sensibility studies, relief and subsidy schemes. ➤ Registration of exporters for scheduled products. ➤ Adapting standards and specifications for the purpose of export of scheduled products. ➤ Carrying out inspection of meat and meat products for ensuring the quality of such products. ➤ Improving the packaging of the scheduled products. ➤ Promotion of export oriented production and development of scheduled products. ➤ Collection and publication of statistics for improving marketing of scheduled products. ➤ Training in the various aspects of industries related to the scheduled products.

<p>3.National Horticulture Board Ministry of Agriculture, Govt of India 85, Institutional Area, Sector – 18 Gurgaon - 122015 (Haryana) Website : www.nhb.gov.in</p>	<ul style="list-style-type: none"> ➤ Develop high quality horticultural farms in identified belts and make such areas vibrant with horticultural activity which in turn will act as hubs for developing commercial horticulture. ➤ Develop post-harvest management infrastructure, ➤ Strengthen Market Information System and horticulture database, ➤ Assist R&D programmes to develop products suited for specific varieties with improved methods and horticulture technology, ➤ Provide training and education to farmers and processing industry personnel for improving agronomic practices and new technologies, ➤ Promote consumption of fruits/vegetables in fresh and processed form, etc.
<p>4.National Co-operative Development Corporation (NCDC), 4, Siri Institutional Area, New Delhi-110016 Website: www.ncdc.nic.in</p>	<ul style="list-style-type: none"> ➤ Planning, promoting and financing programmes for production, processing, marketing, storage, export and import of agricultural produce. ➤ Financial support to Primary, Regional, State and National level marketing societies is provided towards; <ul style="list-style-type: none"> i) Margin money and working capital finance to augment business operations of agricultural produce. ii) Strengthening the share capital base, and iii) Purchase of transport vehicles.
<p>5.Director General of Foreign Trade (DGFT), Udyog Bhavan, New Delhi. Website: www.nic.in/eximpol</p>	<ul style="list-style-type: none"> ➤ Provides guidelines / procedure of export and import of different commodities. ➤ Allot import-export code number (IEC No) to the exporter of agricultural commodities.
<p>6.State Agricultural Marketing Board (SAMBs),</p>	<ul style="list-style-type: none"> ➤ Implementation of the regulation of marketing of agricultural and allied commodities in the state. ➤ Provide infrastructural facilities for the marketing of notified agricultural produce. ➤ Grading of agricultural produce in the markets. ➤ To co-ordinate all the market committees for information services. ➤ To eliminate malpractices in the marketing system.

9.0 UTILIZATION

9.1 Processing:

Processed products such as dehydrated chilli, pickle, powder, paste, sauce, etc., can be prepared for higher returns. Generally growers sell chilli directly even though real return can come only from processed products. Hence, farmers must be educated in the processing of chilli for value addition.

9.2 Uses:

Juice of chilli brings a warming flush to the skin and eased soreness. Capsicum has a tonic and carminative effect and is especially useful in a tonic dyspepsia. Pungent types of chillies are used by the pharmaceutical industry in the preparation of stimulant and counter irritant balms and in stomach ache, carminative and stimulant formulation.

The pungency in chilli is due to the alkaloid capsaicin contained in the pericarp and placenta of fruits. Capsaicin is a key ingredient in many liniments and together with other chemical compounds found in chilli peppers is prescribed in the treatment of rheumatism and bruises. It is also used to treat stomach aches involves poor functioning of stomach muscles. Capsaicins are also being used in clearing the lungs and sinuses, enhance the flow of digestive juices, which trigger the brain to release endorphins (natural pain killers), help to neutralize cavity causing acids, protect the body against cancer through anti oxidant activity. Because of capsaicin's specific excitatory and neurotoxic properties on c-fibres, capsaicin has been extensively used for relieving pain and thermo regulation. Capsicum is administered in the form of powder, tincture, lineament, plaster, ointment, medicated roll etc. Two types of pain relief products are currently being marketed including cream containing 0.75 percent capsaicin (eg. Zostrice- TM) and plaster containing three percent oleoresin (Vorwek-TM). It also corrects bowel disorders and it prevents the formation of puss in the wound and because the red-hot chilli pepper is an inhospitable place for bacteria, its extracts have been used as antibacterial agents.

Oleoresin is a viscous liquid, possessing aroma and flavor, is also extracted from finely ground chilli powder. Capsicum oleoresin is used in medicine internally as a powerful stimulant and carminative and externally as a counter irritant in the treatment of diseases such as rheumatism.

- Swallowing seeds of chillies with hot water are helpful in reducing stomach ache due to cold.

- Capsicum has a powerful action on the mucous membrane and a gargle made of chillies and tannin is found to be beneficial in sore throat.
- An infusion with cinnamon and sugar is a valuable drink for patients suffering from delirium tremens. The same preparation is also used as a rubefacient for the tonsils in tonsillitis.
- Drinking of hot water containing one spoonful of powdered chilli and one spoonful of salt is beneficial for cholera.
- Capsicum with a plaster of garlic, pepper and liquid amber is an efficient stimulant in chronic lumbago.
- In addition to this, applying a decoction of powdered red chilli in the part affected by a dog bite or snakebite minimizes the effect of the poison.
- In Homeopathy, chillies are being used for curing homesick, sleeplessness, head ache or coughing, eye pain, burning pain in the muscles membranes, male impotence etc.

Capsicum is well known for their health benefits but excessive use of chillies is harmful.

10.0 DO'S AND DON'TS

MONTH WISE CALENDAR OF OPERATIONS (DOS AND DONT'S) FOR

CHILLIES

January

- a) Irrigate once in 20-25 days in black soils & 10-15 days in red loamy soils
- b) Apply N.P.V @ 200 litres/acre or monocrotophos 2 ml/litres/to control pod borers
- c) Change the lure of pheromone traps for monitoring pod borers (Spodoptera litura, Heliothis armigera)
- d) Spray captain 1.5 g or maaancozeb 2.5 g or copper oxychloride 3 g/litres of water to control die back & fruit rot diseases.
- a) Apply fertilizer @ 50:25 kg/ha of nitrogen & potash

February

- a) Irrigate once in 20-25 days in black soils & 10-15 days in red loamy soils
- b) Apply N.P.V @ 200 lr. Per acre or monocrotophos 2 ml/liter to control pod borers
- c) Change the lure of pheromone traps for monitoring pod borers (spodoptera litura, heliothis armigera)
- d) Spray captain 1.5 grams or mancozeb 2.5 grams or copper oxychloride 3 g/liter of water to control die back and fruit rot diseases
- e) After second picking of chilli, the produce is exposed to sun for 10-15 days. Spreading on open yards leads to contamination, discoloration. To avoid this use mechanical chilli drier/ solar drier wherever possible.
- f) Always dry in polythene sheets/ or clean drying yards.
- g) The moisture content of drying pods is to be kept 8-10 per cent.

March

Irrigation to be continued based on necessity and soil type

- a) Collection of egg masses/early instar larvae of caterpillars found in-groups may be done manually and destroy them.
- b) Erect pheromone traps for monitoring pod borers 6" above crop level @ 5 per ha.
Change the pheromone cards once in 15 days for better results
- c) Spray Neem Seed Kernel Extract (NSKE) 5% or Bacillus thuringiensis var kurstaki (bio control agent) @ 500 g/ha. for control of early instar larvae of pod borers.

Harvest and Post harvest Management:

- a) Harvest the ripe chilli fruits and dry in clean concrete floor, polythene sheets or cement yards with intermittent turnings.
- b) The optimum moisture content of dried produce 10 per cent for safe storage without developing any mould problem.
- c) Wherever possible use mechanical chilli drier or solar chilli drier to avoid any contamination likely to arise on open drying.

April

- a) Avoid application of pesticides just before picking
- b) Do not allow the pods to over ripe/dry on the plant itself. Periodical picking improve the yield land quality.
- c) Dry the harvested chillies on clean polythene sheets or cement floors to avoid aflatoxin contamination
- d) Dry the produce till the moisture content reaches 10-11 per cent
- e) Prevent contamination with dust and other foreign material. While drying keep the dogs, cats and poultry away from the drying floor
- f) Store the produce in clean and dry gunny bags and stake them on wooden plank 40-60 cms away from the walls to prevent produce from moisture

May & June

- a) On completion of harvesting green manuring can be practiced by sowing pulse crops (pillipesara, cowpea or sunhemp) in the land proposed for next season cultivation
- b) Wherever chilli is intercropped with cotton, dried chilli and cotton plants (after harvest are to be uprooted and cut into small pieces and incorporated into the soil for enhancing the fertility and water holding capacity of the soil.)
- c) If needed soil testing can be taken up during the month.

July

- a) On completion of harvesting, the main field is either kept fallow or green manuring can be practiced by sowing pulse
- b) Crops (pillipesara, cowpea or sunhemp) proposed for next season cultivation
- c) Wherever sufficient rains are received sowing of seeds may be taken up in the nursery.

August

- a) Green manure crop flowered and ready, it can be incorporated in the fields
- b) Transplant seedlings to the main field
- c) If moisture inadequate in the main field irrigation may be taken up

- d) 50 percent of the recommended dose of fertilizer (i.e. NPK 100:50:50 kg/ha.) may be applied at the time of transplanting
- e) Bio-fertilizers can also be applied.

September

- a) Irrigate chilli fields once in 7-10 days based on rainfall and soil type
- b) The field should be kept weed free till the crop almost covers the land area
- c) Organic manure/ bio fertilizers can be applied
- d) Triaccontanol can be sprayed @ 1.25 ppm (2.5 l;ml of Vipul dissolved in 10 litres of water) on 20th day of transplanting to increase photosynthetic activity of plants
- e) Application of carbofuran granules @ 10-12 kg/ha may be done after transplanting to control problems like nematodes

October

- a) Apply first dose of fertilizer in transplanted field (Nitrogen and Potash @ 50:20 kg/ha.
- b) Erect pheromone traps for monitoring pod borer 6” above the crop level @ four – five numbers per acre
- c) Erect bird perches to control pod borers @ 10 numbers per acre
- d) Spray monocrotophos 1.6 ml or acephate one gram or phosolone 3 ml per litre of water to control thrips
- e) Open trenches between the rows with the help of plough to support the plants and for irrigation
- f) Weeding may be done if required.

November

- a) Spray copper oxychloride 3 g/litre of water to control die back & fruit rot diseases
- b) Change the lure of pheromone traps for monitoring pod borers
- c) N.P.V @ 200 L.E. per acre or acephate 1 g/ha. also can be applied to control pod bores
- d) Apply second dose of fertilizer (i.e. 50:20 kg/ha. of nitrogen & potash)
- e) Apply wettable sulphur 3 g. or micronised sulphur 2.5 g.or dicofol 5 ml/1. water to control aphids.
- f) Irrigate once in 20-25 days in black soils and 10-15 days in red loamy soils.

December

- a) Apply fertilizer @ 50:25 kg/ha of nitrogen and potash
- b) Irrigate once in 20-25 days in black soils and 10-15 days in red loamy soils
- c) Spray captain 1.5 grams or mancozeb 2.5 g., or copper oxychloride 3 gr. Per litre of water to control die back and fruit rot diseases.

- d For monitoring pod borers change the hire of Pheromone traps and apply NPV @ 200 per acre or acephate 1 gr. Per litre.

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www.ninindia.org
www.indianspices.com
www.spiceboard.org

Spices Grading and Marking Rules

1. Short title, application and commencement.-These rules may be called Spices Grading and Marking Rules, 2005.

(1) They shall apply to following spices (whole and powder), namely:-

- (a) Turmeric (*Curcuma longa* L.)
- (b) Chillies/Capsicums/Paparika (*Capsicum annum* L.)
- (c) Pepper (*Piper nigrum*)
- (d) Cardamom (*Elettaria cardamomum*)
- (e) Large Cardamom (*Amomum subulatum* Rozburg)
- (f) Coriander (*Coriandrum sativum* L.)
- (g) Ginger (*Zingiber officinale*)
- (h) Cumin (*Cuminum cyminum* L.)
- (i) Fennel (*Foeniculum vulgare*)
- (j) Fenugreek (*Trigonella foenum graecum* L.)
- (k) Celery seed (*Apium graveolens* L.)

(3) They shall come into force on the date of their publication in the Official Gazette.

2. Definitions.- In these rules, unless the context otherwise requires,-

- (a) "Agricultural Marketing Adviser" means the Agricultural Marketing Adviser to the Government of India;
- (b) "Authorised packer" means a person or a body of persons who has or have been granted a certificate of authorization to grade and mark spices in accordance with the grade standards and procedure prescribed under these rules;
- (c) "Certificate of Authorisation" means a certificate issued under the provisions of the General Grading and marking Rules, 1988 authorizing a person or a body of persons to grade and mark Spices (whole and powder) with the grade designation mark;
- (d) "General Grading and Marking Rules" means the General Grading and Marking Rules, 1988 made under Section 3 of the Agricultural Produce (Grading and Marking) Act, 1937 (1 of 1937);
- (e) "Grade designation mark" means the "Agmark Insignia" referred to in rule 5.
- (f) "Schedule" means a Schedule appended to these rules.

3. Grade designations.-The Grade designations to indicate the quality of spices shall be as set out in column I of Schedule I to XXVIII.

4. Quality.-For the purpose of these rules, the quality and general characteristics of spices (whole and powder) shall be as given against each grade designation in columns and Schedules mentioned below:-

Columns	Schedules
(2) to (6)	XXVIII,
(2) to (7)	I, II, X, XXV and
XXVII	
(2) to (8)	IV, XI, XIV and XVI
(2) to (9)	VII, XIII, XVII, XIX,
XX	

(2) to (10)
XXI,

(2) to (11)
(2) to (12)

and XXIV
III, XV, XVIII,

XXII and XXVI
VIII, IX and XII
V and VI

5. Grade designation mark :- The grade designation mark shall consist of "AGMARK Insignia" consisting of a design incorporating the certificate of authorization number, the word "AGMARK", name of commodity and grade designation resembling the design as set out in Schedule XXIX.

6. Method of packing:-(1) Spices (whole and powder) shall be packed in gunny bags/jute bags, polywoven bags, poly pouches, cloth bags or other suitable packages which shall be clean, sound, free from insects, fungal infestation and the packing material shall be as permitted under the Prevention of Food Adulteration Rules, 1955 made under Section 23 of the Prevention of Food Adulteration Act, 1954 (37 of 1954).

(2) Suitable lining of food grade polypropylene/polyethylene shall be used for packing of Spices (whole and powder) in gunny bags/jute bags, polywoven bags, cloth bags, paper bags and cardboard cartons;

(3) Containers and packaging material, shall be made of substances which are safe and suitable for their intended use. They should not impart any toxic substance or undesirable odour or flavor to the product; (4) Spices (whole and powder) shall be packed in pack sizes as per the instructions issued by the Agricultural Marketing Adviser from time to time;

(5) Each package shall contain Spices (whole and powder) of the same type and of the same grade designation;

(6) Graded material of small pack sizes of the same lot/batch and grade may be packed in a master container with complete details thereon along with grade designation mark;

(7) Each package shall be securely closed and sealed.

7. Method of Marking:-(1) A grade designation mark shall be securely affixed to or printed on each package in a manner approved by the Agricultural Marketing Adviser or an officer authorized by him in this behalf in accordance with Rule 11 of the General Grading and Marking Rules, 1988;

(2) In addition to the grade designation mark, following particulars shall be Clearly and indelibly marked on each package:-

(a) Name and address of the packer;

(b) Place of packing/manufacturing;

(c) Date of packing;

(d) Lot/batch number;

(e) Grade;

(f) Season of harvest (in case of chilies only);

(g) Net weight;

(h) Maximum retail Price;

(i) Best before-----month-----year.

(3) The ink used for marking on packages shall be of such quality which may not contaminate the product;5-

(4) The authorized packer, may, after obtaining prior approval of the Agricultural Marketing Adviser or an officer authorized by him in this behalf, mark his private trade mark or trade brand on the graded packages provided that the same

do not indicate quality other than that indicating by the grade designation mark affixed to the graded packages in accordance with these rules.

8. Special conditions of certificate of authorization:- In addition to the conditions specified under the sub-rule(8) of rule 3 of the General Grading and Marking Rules, 1988, the following shall be the special conditions of every certificate of authorization issued for the purpose of these rules:-

- (1) The authorized packer shall either set up his own laboratory or have access to an approved grading laboratory for testing of Spices (whole and powder);
- (2) The premises shall be maintained in hygienic and sanitary conditions with proper ventilations and well lighted arrangement. The personnel's engaged in these operations shall be in sound health and free from any infectious, contagious or communicable diseases;
- (3) The premises shall have adequate storage facilities with pucca floor and free from rodent and insect infestation;
- (4) The authorized packer and the approved chemist shall observe all instructions regarding testing, grading, packing, marking, sealing and maintenance of records which may be issued by the Agricultural Marketing Adviser or any other officer authorized by him in this behalf from time to time.

SCHEDULE III
(see rules 3 and 4)

Grade designations and quality of Chillies/Capsicums/Paprika

Grade Deesignation	Quality							
Special Characteristics								
	Organic extraneous matter % (m/m) (Max.)	Inorganic extraneous matter % (m/m) (Max.)	Unripe and marked fruits % (m/m) (Max.)	Broken fruits and fragments % (m/m) (Max.)	Moisture % (m/m) (Max.)	Total ash % (m/m) (Max.)	Acid insoluble ash % (m/m) (Max.)	Cap-saicinoid content % (m/m) (Max.)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Special Standard	0.8 4.0	0.2 1.0	2.0 5.0	5.0 15.0	10.0 12.0	7.0 8.0	1.25 1.25	0.3 Not specified

General Characteristics
(10)

- (1) Chillies/Capsicums/Paprika are dried pods (fruits with stalk of plants of genus Capsicum);
- (2) It shall have a characteristic strong odour;
- (3) It shall be free from mould growth, living insects and practically free from dead insects, insect fragments and rodent contamination, extraneous coloring matter, coating of mineral oil and other harmful substances;
- (4) It shall comply with restrictions in regard to Aflatoxins, Metallic Contaminants, Insecticide or Pesticide residue, Poisonous metals, naturally occurring Contaminants, Microbial load etc. as specified by the Codex Alimentarius

Commission or as per buyers requirements for Export purposes and Prevention of Food Adulteration Rules, 1955 for domestic trade.

Definitions :

- (a) "Broken fruits" means Fruits which are broken during handling;
- (b) "Fragments" means small pieces of fruits coming from broken fruits;
- (c) "Inorganic extraneous matter" of soil/sand; includes stones, particles
- (d) "Marked fruits" means black or black stained fruits;
- (e) "Organic extraneous matter" and calyx pieces; includes stalks, leaves
- (f) "Unripe fruits" means Fruits not yet fully mature, the colour of which is different from that of the batch under consideration.

- Note: (1) Capsicum shall have a length of minimum 25 mm.
 (2) For special grade capsaicinoid content shall be declared on the label.

SCHEDULE IV
(see rules 3 and 4)

Grade Deesignation	Quality							
Special Characteristics								
	Organic extraneous matter % (m/m) (Max.)	Inorganic extraneous matter % (m/m) (Max.)	Unripe and marked fruits % (m/m) (Max.)	Broken fruits and fragments % (m/m) (Max.)	Moisture % (m/m) (Max.)	Total ash % (m/m) (Max.)	Acid insoluble ash % (m/m) (Max.)	Cap-saicinoid content % (m/m) (Max.)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Special	0.8	0.2	2.0	5.0	10.0	7.0	1.25	0.3
Standard	4.0	1.0	5.0	15.0	12.0	8.0	1.25	Not specified

General Characteristics
(8)

- (1) Ground Chilies/Capsicums/Paprika are the products obtained by grinding clean, dried, ripened fruits of whole Chilies/Capsicums/Paprika respectively. It can also be a mixture of Chilies, Capsicums and Paprika.
- (2) It shall be without any added coloring matter; and flavouring matter
- (3) It shall also be free from any extraneous or undesirable odour or flavor;
- (4) It shall be free from mould growth, living insects and practically free from dead insects, insect fragments, dirt and rodent contamination;

(5) It shall comply with restrictions in regard to Aflatoxins, Metallic Contaminants, Insecticide or Pesticide residue, Poisonous metals, naturally occurring Contaminants, Microbial load etc. as specified by the Codex Alimentarius Commission or as per buyers requirements for Export purposes and the Prevention of Food Adulteration Rules, 1955 for domestic trade.

Note: (1) For special grade, capsaicinoid content shall be declared on the label.

(2) In standard grade, chillies powder may contain any edible vegetable oil to a maximum limit of 2 per cent by mass under a label declaration for the amount and nature of vegetable oil used.

[Annexure II](#)

Whole capsicum pods (chilies): Chemical and physical specifications

Specification	Suggested Limits
ASTA cleanliness specifications	
Whole dead insects, by count	4
Mammalian excreta, by mg/lb	1
Other excreta, by mg/lb	8.0
Mold, % by weight	3.00
Insect defiled/infested, % by weight	2.50
Extraneous, % by weight	0.50
FDA DALs	
Insect infested and/or moldy pods by weight or	Ave. of 3%
Mammalian excreta per pound identified as to source when possible	Ave. of 1 mg
Volatile oil	N/A
Moisture*	11.0% max
Ash	8.0% max
Acid-insoluble ash	1.0% max

*ASTA suggested maximum moisture level.

Ground capsicum (not including paprika): Chemical and physical specifications

Specification	Suggested Limits
FDA DALs (6 subsamples)	
Insect fragments or	Ave. of 50 or more/25 g
Rodent hairs or	Ave. of 6 or more/25 g
Howard mold count	Ave. of 20%
Volatile oil	N/A
Moisture	11.0% max
Total ash	8.0% max
Acid-insoluble ash	1.0% max
Military specifications (EE-S-631J, 1981) for <i>crushed</i> red pepper	
Volatile oil (ml/100 g)	N/A
Moisture	10.0% max
Total ash	8.0% max
Acid-insoluble ash	1.0% max
Granulation	98% min through a U.S.S. 4 85% min through a U.S.S. 8 95% min on a U.S.S. 20
Scoville pungency	30,000 - 55,000
Bulk index*	
Ground (ml/100 g)	200
Crushed	235

Average bulk index. Granulation will effect number.

Terminal Markets Complex

Objectives

- (a) Main objectives of setting up Terminal Markets Complex (TMC) are:
- (i) Link farmers to markets by shortening supply chain of perishables and enhance their efficiency and increase in farmer's income;
 - (ii) Provide professionally managed competitive alternative marketing structures with state of art technology, that provide multiple choices to farmers for sale of their agricultural produce;
 - (iii) Drive reforms in agricultural marketing sector resulting in accelerated development of marketing and post harvest infrastructure including cool chain infrastructure in the country, through private sector investment;
 - (iv) Bring transparency in market transactions and price fixation for agricultural produce and through provision of backward **linkages** to enable farmers to realise higher price and higher income.

Salient Features

- (a). Terminal Market Complex (TMC) can be set up in States, which undertake reforms in their laws relating to agricultural marketing, to provide direct marketing and permit the setting up of markets in private and cooperative sectors.
- (b). TMC will operate on a Hub-and-Spoke Format wherein Terminal Market Complex (hub) would be linked to a minimum number of Collection Centres (CC) (spokes) which are essentially required to support the Terminal Market Complex project.
- (c). Spokes will be conveniently located at key production centres to allow easy farmer access and catchment area of each spoke will be based on meeting convenient needs of farmers, operational efficiency and effective capital utilisation of investment.
- (d). TMC will establish backward linkages with farmers through collection centres and forward linkages through wholesalers, distribution centres, retail cash and carry stores, processing units for exporters etc.
- (e). Collection Centres in production areas will integrate producers and retailers, processing units and exporters etc. into market system. The number of Collection Centres shall be determined in each case depending on the size of the market, distance from growing areas and other factors.
- (f). Electronic auction system will be established to ensure transparency in price fixation and competition.
- (g). Scheme would attract and facilitate private sector investment in agribusiness sector by assisting key stakeholders in sectors, such as entrepreneurs, processing industries, exporters, producer associations and farmers etc. through provision of subsidy under National Horticulture Mission (NHM).

- (h). Producers, farmers and their associations and other market functionaries from any part of the country may use infrastructure and facilities of TMC, directly or through collection centres.
- (i). TMC will provide one-stop solution in terms of providing logistics support including transport services and cool chain facility.
- (j). TMC Project will be implemented as a separate company/SPV to be registered under Companies Act, 1956 through suitable Private Enterprise (PE) to be selected as Promoter through process of competitive bidding. PE should offer to provide up to 26% share holding in equity for TMC Project to Producers' Association¹ at inception of project and accordingly make reasonable efforts² for ensuring the participation from Producers' Associations.

Producers Association will consist of farmer societies, farmers cooperative societies registered in India engaged in Agricultural and allied activities, Producer Company, registered NGO's empanelled with GOI/State Govt./Planning Commission and SHGs recognized under schemes of Government of India or State Governments and working in agricultural production, Independent Commodity Boards and other registered organizations such as APMCs etc engaged in production, procurement and trading of agricultural commodities. The producer association should be separate from the Lead Technical and Lead Financial Member

- (k). The area of operation of the TMC should be clearly defined and any other proposal in future for setting up of TMC within the whole or part of the defined area of operation of the designated TMC and its CCs will not be granted any subsidy under NHM for a period of 10 years.

Eligibility

Terminal Market Complex project would be built, owned and operated by the selected Private Enterprise (PE) through Competitive Bidding process. PE includes individual or consortium, Group of Farmers/Growers/Consumers/Producer Organisations/Producer Company, Partnership/ Proprietary firms, Companies, Marketing Boards, Public Sector Undertaking, Co-operatives, registered NGOs empanelled with GOI/State Govt./Planning Commission, recognised Self Help Groups under the schemes of GOI/State Govts. and other registered bodies engaged in production and trading of agricultural produce. The PE could also be a consortium of entrepreneurs from, *inter-alia*, agri-business, cold chain, logistics, warehousing, agri-infrastructure and related background.

Commodities

The commodities to be marketed by the TMC will include all perishables, *inter-alia*, fruits, vegetables, flowers, spices, aromatics, herbs, medicinal plants, meat products, poultry products, dairy products and fish and marine products etc. Non-perishables can also be handled in the TMC. However, the annual throughput for perishable horticultural produce such as fruits, vegetables, flowers, medicinal plants, aromatics, herbs etc handled by each TMC should not be less than 70% of the throughput capacity of the TMC. In addition to this, each TMC shall be allowed to handle other perishable products (other than horticultural produce such as milk, dairy, poultry, meat, fish and marine products etc) and Non-Perishables³ products. Volume of other perishable products (other than

horticultural produce) and Non-Perishable products shall not exceed 30% of throughput capacity of TMC.

Release of Subsidy

- (a) Subsidy of NHM for Terminal Market Complex Project will be released in following five instalments.
- (i) I instalment on completion of 25% of project ----- 15% of the approved subsidy
 - (ii) II instalment on completion of 50% of project ----- 20% of the approved subsidy
 - (iii) III instalment on completion of 75% of project ----- 25% of the approved subsidy
 - (iv) IV instalment on completion of 100% of project ----- 30% of the approved subsidy
 - (v) V instalment on completion of one year of operation of project 10% of the approved subsidy
- (b) Release of subsidy shall be subject to utilization of previous subsidies for this project and Inspection certificate is issued by Joint inspection team comprising of Nodal officer or his representative, IC and a representative of DAC, Ministry of Agriculture for satisfactory 16 completion of prescribed mandatory capital project. Release of subsidy shall also subject to equity participation of Producer Association, as promised by the PE. In case % of equity participation from Producers Association, at time of release of fourth instalment of subsidy, is less than % mentioned at time of submission of technical bid and the PE has not made reasonable effort for ensuring participation of Producer's associations, GoI/State Government shall have the right to withhold release of entire amount of subsidy to PE. Further SHM/State Government may:
- (i). Intimate this requirement to PE through written communication within 15 days of the due date of release of first instalment of subsidy,
 - (ii). Stop release of IV and V instalment of subsidy till the PE fulfils the required equity participation from Producers' Associations
- (c) Provided that if the percentage of equity participation by producer association remains below the percentage of equity of the project as promised /quoted, by the PE at the time of bidding and considered at the time of evaluation of the bid, within two years of signing of OMDA or transfer of land to PE whichever is later, despite reasonable efforts made by PE, no restrictions shall be imposed on the PE in this regard and the eligible subsidy shall be released to him as due. (d) This stipulation will not be applicable to successful bidder/PE who has not committed any equity to Producers' Association in his bid.

(For more details visit www.agmarknet.nic.in)

***SPECIAL THANKS ARE DUE TO ALL THE STAFF AT THE
SUB-OFFICES OF THE DIRECTORATE OF MARKETING
AND INSPECTION, ASSOCIATED WITH THE FIELD
SURVEY, DATA COLLECTION AND COMPILATION
RELATED TO THIS REPORT.***

**OFFICIALS OF DMI, AT B.H.O., NAGPUR, ASSISTED
IN THE PREPARATION OF THIS REPORT.**

1) Computer feeding of : Smt. P. Chawla, Steno.
approved report. Shri A.S. Thubrikar,
U.D.C.

2) Computer type setting : Shri A.S. Thubrikar,
U.D.C.