

# IFEAT SOCIO-ECONOMIC REPORT ON CHILLI

**CHILLI**  
*Capsicum sp.*  
Family: Solanaceae

## INTRODUCTION

Chilli (botanically known as *Capsicum annuum* L.; *Capsicum frutescens* L.), commonly referred to as the 'wonder spice,' is one of the most important commercial spice crops used extensively worldwide. It is a white flowered, dark green or purple leaved shrubby perennial plant that grows up to 1.5 metres in height. There are more than 3,000 different varieties of chillies all over the world. People have given chillies numerous names, for instance, hot pepper, cayenne pepper, sweet pepper, bell pepper, red pepper, etc.

One of the main uses for chilli is in culinary applications, as a spice, seasoning, or to add colour. However, chillies have a diverse range of uses, which includes pharmaceuticals, cosmetics, farm protection, paint manufacturing and even in self-

defence weapons. It also has its place in Ayurveda, the traditional Indian medical system, revealing its numerous medicinal properties such as stimulating good digestion and endorphins and as a natural pain reliever. The components that give chilli peppers their intensity when ingested or applied topically are capsaicin and several related chemicals, collectively called capsaicinoids.

Psychologist Paul Rozin suggests that eating chillies is an example of a "constrained risk" like riding a roller coaster, in which extreme sensations like pain and fear can be enjoyed because individuals know that these sensations are not actually harmful.

India is the world's largest producer, consumer, and exporter of chilli peppers, with about 38 per cent share (ISC crop report, 2019) of global production. Indian chilli is exported to 60 countries. Other major chilli growing countries are Myanmar,

Bangladesh, Pakistan, Thailand, Vietnam, China, Nigeria and Mexico. In this socio-economic report, the focus is on Indian chilli, the source for high pungency varieties. Indian chilli is in greater demand globally due to its unique aroma and pungency. Specific coloured chillies, as produced in India, China, Spain, Mexico and parts of Africa, are not discussed in this report.

There are five major species of *Capsicum* under cultivation, though several wild species have been identified recently. In India, the major species grown are *Capsicum annuum* and *Capsicum frutescens*, the former being the more common of the two. Most of the chilli grown in India (about 95 per cent) is cultivated in the states of Andhra Pradesh, Telangana, Karnataka, Madhya Pradesh and Tamil Nadu. Andhra Pradesh, a state in South India, produces about 30 per cent of all the chillies produced in the country, but contributes to 75 per cent of India's chilli exports.



GRADING

DRYING OF CHILLI

## PRODUCTION AND PROCESSING CHARACTERISTICS

Chilli is a tropical and subtropical plant requiring a combination of warm, humid, yet dry weather. The ideal temperature range for chilli growth is between 20°C and 25°C. Chillies can be grown both as a kharif and rabi crop. In kharif, the crop is sown in the period of June to July, and in rabi, during September to October. If chillies are grown as summer crops, then the period of January to February is chosen. The harvesting period starts in November and goes on until April.

Chilli can be harvested when it is green or ripe, according to its intended use. Ripe fruits may be seen in 100-110 days after transplanting. Chillies which are used as a vegetable are generally harvested whilst they are still green but fully grown. For powdered chilli and dry chilli, the fruits are harvested at the full-ripe stage, when they have turned dark red in colour.

After harvesting, the red chillies undergo sun-drying for 12 to 15 days to reduce the moisture level to about

12 per cent. Once this has been done, the dried red chillies are procured by various traders, processors, and exporters.

The crop is consumed in various forms — chilli with the stem, destemmed chilli, chilli flakes, crushed or powdered chilli, and oleoresin (with various blends depending on its heat value and colour).

## SOCIAL AND ECONOMIC CHARACTERISTICS

In India, red chillies are grown on about 0.7 million hectares (ha) of land by marginal or small farmers, holding an average of one ha of land. In 2018, around 1.6 million tonnes of red chilli was produced, of which 70 per cent was consumed domestically, while 30 per cent was exported. (Spices Board of India, 2018)

The production and export of chilli provides a wide range of economic activities for farmers, agricultural labourers, agronomists, pesticide companies, seed companies, traders, warehouses, auction-based companies, exporters and food processing industries. Chilli, being

a labour-intensive crop, requires approximately 294 labour days per ha per year, which generates employment amounting to 212 million labour days per year (industry estimate). The crop provides a livelihood for more than one million farmers, two million agricultural labourers and over 0.25 million agricultural practitioners. The impact of this crop in India is second only to the two staples of wheat and paddy.

In India, the cost for the cultivation of chilli is around USD 3,560 per ha per annum. On average, a chilli crop produces four to five tonnes of harvest per ha, which fetches approximately USD 2,175 per ha annually as net returns to the farmers.

The industry has always played an important role in the lives of the chilli farmers in India. Many in the industry promote sustainable supply chain practices and emphasise Integrated Pest Management (IPM). Under this programme they partner with the farmers, guide them on Good Agricultural Practices (GAP),



TRAY METHOD of seedling production



INTEGRATED PEST MANAGEMENT in chilli field



CHILLI BEING HARVESTED



TRAINING PROGRAMME conducted for chilli farmers

educate them on the use of approved fertilisers and pesticides, provide technical assistance and assure buy back. There have also been interventions through IT enabled agri-extension activities using remote sensing, farmer sustainability certification programmes and more, which help farmers lower their production costs and improve their returns.

Major players in the industry also work closely with state governments under the public-private partnership (PPP or 3P) model, to improve chilli exports and promote the adoption of good agricultural practices, and to support thousands of chilli farmers to realise a significant increase in net returns, when compared with conventional cultivation.

### VALUE ADDITION

Indian chillies are also one of the biggest crops for value added industry in the forms as listed below:

- A. Whole chillies in direct culinary application
- B. Ground/cracked/flakes
- C. Extracts – oleoresins
- D. Actives – capsaicins/capsaicinoids for nutraceuticals

There are over 10,000 cold storages across the states of Andhra Pradesh, Telangana, Karnataka and Tamil Nadu supporting the storage of whole chillies during off season, catering to the year-round requirements of the chilli pods. The powder/ground chilli industry further contributes to significantly high employment rates across the western and southern part of India. A rough estimate has put this number close to 25,000 industrial workers.

One step higher up the value chain is the chilli extracts industry.

India is the world's largest producer of chilli oleoresin with strength ranging from 0.2 million Scoville Heat Units (SHU), going all the way up to five million SHU. A small number of the world's leading oleoresin producers located in South India contribute to nearly 85 per cent of global chilli oleoresin production, with approximately 4,000 MT of chilli oleoresin in various strengths (levels of SHU) valued at over USD 80 million. This supports industrial employment

for nearly 5,000 workers in processing factories.

In contrast to the large quantities of chilli oleoresin production, negligible quantities of chilli essential oil are produced by steam distillation of chilli seeds. This should not be confused with "chilli oil" which is a vegetable oil infused with chilli peppers.

Even higher up the value chain are nutraceuticals and pharmaceuticals which are high end isolates from extracts of chilli. These are used in a variety of functional health food supplements and also in topical applications as orthopaedic muscle relaxants. This industry is now growing at over 15 per cent compound annual growth rate (CAGR) and is currently valued at over USD 15 million.

The value of the natural colour portion (red food colour) from hot chilli adds another USD 30 million in value creation to this group of products and is usually an addition in the extracts industry.

### CONCLUSIONS

Today, it is unimaginable to think of Indian cuisine without the hot spice, chilli. One of the world's hottest chillies, known as the bhoot or bhut jolokia, is cultivated in the hilly terrain of Assam, India. Chilli is a popular and important spice, not only in India but all over the world.

Chilli is a very labour-intensive crop. In India alone, it provides a livelihood for at least three million farmers and labourers as well as another 0.25 million agri-practitioners servicing the sector. In addition, an entire agri-eco-system survives on this crop.

Chillies from India have had their fair share of challenges:

- A. Contamination with illegal dyes through unauthorised pesticides
- B. High levels of pesticide residues
- C. High aflatoxins due to rains during drying
- D. Lack of new seed varieties/cultivars to counter the climatic changes and pest incidences

Many of these have been mitigated over the last two decades through conscious efforts from the industry directly and through industry bodies running National Sustainable Spice

Programmes (NSSP) through the World Spice Organisation (WSO). There is a need to invest continuously to meet the growing standards from all over the world. The banning of pesticides in the EU and other parts of the world does affect crops in developing countries because alternate molecules or other bio-pesticides are not as effective. There should always be a period of transition to factor the changes and bring standards up, to change the age-old practices at farm level.

If India can continue to meet the increasing quality demands of the international market, exports from the country can be further improved. An exemplar of a public-private partnership between state governments and private companies, has demonstrated improvement in the production of food-safe chilli and its exports. Strengthening such partnerships on a large scale can realise the national goals of doubling farmer incomes and agri-exports.

There are other major chilli growing regions around the world. China is the second largest producer of coloured chillies. There is also a large variety of chilli from Mexico, Spain and parts of Africa.

If any of our IFEAT members can provide information from these sources, it will help create a more detailed picture of chillies from around the world and we hope to address this in one of our socio-economic reports in the near future.

### SOURCES AND REFERENCES

- ITC Limited - Spice Business Division
- Mane Kancor Ingredients Limited - Extracts Division
- Spices Board of India, 2018. Major Spice State Wise Area Production. Available at: [www.indianspices.com/sites/default/files/majorspicestatewise.pdf](http://www.indianspices.com/sites/default/files/majorspicestatewise.pdf)
- International Spice Conference, 2020. ISC Crop Survey Chilli 2019-20
- R. Geetha and Dr. K. Selvarani, 2017. A Study of Chilli Production and Export from India

The details for this report have been compiled and collated by Geemon Korah and the Mane Kancor team with the IFEAT Socio-Economic Committee.