

# Coffee Production Industries problems and prospects

## - An overview

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### **Abstract:**

Being a coffee producer means living a life of uncertainty. While measures can be taken to improve quality and therefore prices, the truth is that market trends and harvest yield/quality are unpredictable. Nothing is certain until the coffee is bagged and cupped, and the price has been paid. And coffee producers are notoriously poorly paid in a relatively rich industry. Part of this is due to the structure of the supply chain. Another part of it is due to the risks inherent in coffee farming, from unpredictable weather to pests and labor shortages. We couldn't hope to comprehensively cover all of these issues in just one article, but here are some of the biggest, most pressing challenges facing coffee producers around the world. Pests, diseases, and fungi have become a real threat for many producers. Coffee leaf rust (la roya) is one of the most famous diseases, and has been affecting coffee crops for over a century. In 2012, it hit Central America hard. And over the next two years, it caused over \$1 billion in damage (USAID). Producers have no power over changes in the environment, but when their harvest suffers as a result, they do too. They need their harvest season to cover the fixed costs they've incurred throughout the year. Currently, climate change is leading to rising temperatures and new rainfall patterns – something that's placing the Arabica coffee species under threat. There are four main species: Arabica, Robusta, Excelsa, and Liberica.

Arabica is widely considered to be the best quality, thanks to its aromatic flavours, and so it attracts higher prices. It also accounts for roughly twice as much of the international coffee market (ICO). However, Arabica is more sensitive to temperature increases, which reduce its growth, ability to flower, and consequent ability to produce fruit. It needs to grow at cooler temperatures than the other species. This means it's usually cultivated at higher altitudes. As climates change, the available fertile land for Arabica decreases. In fact, the Intergovernmental Panel on Climate Change (IPCC) has predicted a 10-20% decrease in overall crop yields by 2050. What's more, pests that once found the high altitudes of Arabica farms too cold to survive are now able to thrive up there. And Arabica is more sensitive to these than Robusta.

*Key words: coffee producers, cultivation, aromatic flavor, Arabica, Robusta, Excelsa, Liberica.*

### **Introduction:**

Coffee is the second most important beverage crop of India next only to tea. It is indigenous to Abyssinia Plateau (Ethiopia) from where it was taken to Arabia in 11th century. From Arabia, its seeds were brought to India by Baba Budan in the 17th Century and were raised in the Baba Budan Hills of Karnataka. British planters took keen interest in coffee plantations and large coffee estates were established near Chikmagalur (Karnataka) in 1826, in Manantody (Wynad) and Shevoroy in 1830 and Nilgiris in 1839. Currently, there are over 52,000 coffee gardens giving employment to 2.5 million persons.

Coffee plant requires hot and humid climate with temperature varying between 15°C and 28 °C and rainfall from 150 to 250 cm. It does not tolerate frost, snowfall, high temperature above 30°C and strong sun shine and is generally grown under shady trees. Prolonged drought is also injurious to coffee. Dry weather is necessary at the time of ripening of the berries.

Stagnant water is harmful and this crop is grown on hill slopes at elevations from 600 to 1,600 metres above sea level. Northern and eastern aspects of slopes are preferred as they are less exposed to strong afternoon sun and the south- west monsoon winds. Well drained, rich friable loams containing good deal of humus and minerals like iron and calcium are ideal for coffee cultivation. Apart from the traditional quality criteria associated with coffee the new awareness of the human health risk posed by a mycotoxin viz., Ochratoxin-A (OTA) contamination of coffee brings yet another consideration into the judgment of the acceptability of coffee in the market

The soil must be properly manured to retain and replenish fertility and to increase productivity. Coffee cultivation requires plenty of cheap and skilled labour for various operations including sowing, transplanting, pruning, plucking, drying, grading and packing of coffee. It's easy to hear data like this and not be able to picture the real impact on the farm. But while this change takes place slowly, over years, it's still visible in weaker trees and greater numbers of pests. What's more, those sudden heavy rains do have a strong and immediate impact. Producers rely on a dry harvest season – something that, at one point in time, in most countries they could take nearly for granted. Now, however, it is a different story. Heavy rain can cause issues during harvesting and processing: cherries splitting on the tree and losing their mucilage, fermentation during processing, and more. This is a particular concern when producers are honey or natural/dry processing coffee, since these need lots of time under direct sunlight to thoroughly dry. They can also lead to unpredictable harvests. Coffee cherries ripen nine months after the coffee flowers blossom (with Arabica – it varies from species to species).

### **Objective:**

This paper intends to deep dive into following aspects

1. Challenges in coffee production
2. Prospects and opportunities for sustainable coffee cultivation

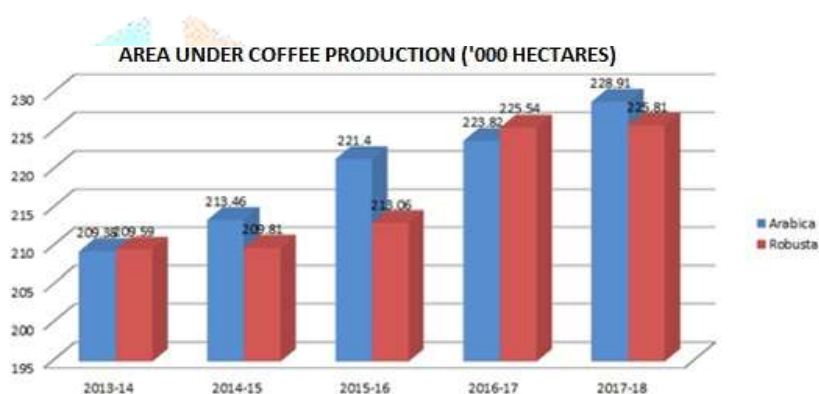
### **Production and Distribution:**

India produces about 2.5 per cent of world's coffee on almost the same percentage of coffee plantations. Thus India is an insignificant producer of coffee and stands nowhere when compared with Brazil (25%), Columbia (15%) and Indonesia (7%). However, India has progressed a lot in terms of absolute figures as is clear from Table 24.27. Coffee Arabica and Coffee Robusta are the two main varieties of coffee grown in India accounting for 49 per cent and 51 per cent of area respectively under coffee.

The restricted agro-climatic conditions have forced the coffee plantations to confine themselves to small area in south India comprising hill areas around Nilgiris. Almost the entire production is shared by three states namely Karnataka, Kerala and Tamil Nadu. Karnataka is the largest producer accounting for about 70 per cent of total coffee production and 60 per cent of the area under coffee in India. This state also gives the highest yield of 10.3 quintals/hectare. Most of the 4,650 plantations are at about 1,370 metres above sea level where annual rainfall is 125-150 cm. Kodagu and Chikmagalur account for over 80 per cent of the state's total output. The other important coffee producing districts are Shimoga, Hassan and Mysore. Kerala is the second largest producer of coffee but lags far behind, accounting only for about 23.27 per cent of the total

production of the country. Its yield of 7.9 quintals/hectare is also low as compared to 10.3 quintals/hectare of Karnataka. Most of the coffee plantations are at an altitude of 1,200 m where annual rainfall is over 200 cm. Kozhikode, Waynad, Malappuram, Kollam, Kannur and Palakkad are the chief producing districts. Tamil Nadu is the third largest producer where India's 6 per cent coffee is produced. About half of Tamil Nadu's coffee is produced in Nilgiri district. The other districts are Madurai, Tirunelveli, Salem and Coimbatore. Some coffee is also grown in Satara and Ratnagiri districts of Maharashtra. In line with the national policy of tribal development, coffee cultivation is being encouraged in such non-traditional areas as Andhra Pradesh, Orissa, Maharashtra, the north-eastern states and Andaman and Nicobar Islands.

### Trade:



Among the plantation crops, coffee has made significant contribution to the Indian economy during the last 50 years. Although India contributes only a small per cent of the world production, Indian coffee has created a niche for itself in the international market, particularly Indian Robustas which are highly preferred for their good blending quality.

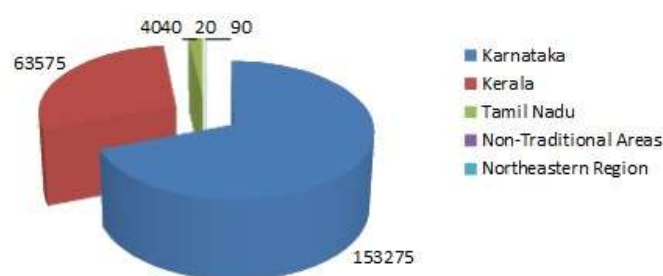
Arabic coffee is also well received in the international market. In short Indian coffee is well known for its quality and is much in demand in the international market. Therefore, India exports coffee to a large number of countries including U.K., the U.S.A., Russia, Australia, Iraq and a large number of countries of continental Europe.

Chennai, Mangalore and Calicut are the chief ports of export. Indian coffee exports have registered significant increase, both in terms of quantity and earnings during the last few years (see Table 24.29). In 2003-04 India exported 188 thousand tonnes of coffee which was two-thirds of the total production. The total earnings from the export of coffee in that year amounted to Rs. 1,066 crore. In India, coffee is traditionally grown in the Western Ghats spread over Karnataka, Kerala and Tamil Nadu. Coffee cultivation is also being expanding rapidly in the nontraditional areas of AP and Odisha as well as in the North East states. Coffee is predominantly an export oriented commodity and 65% to 70% of coffee produced in the country is exported while the rest is consumed within the country. Indian coffee industry earns a foreign exchange to the tune of about Rs.4000 Crores. Indian coffee has created a niche for itself in the international market and the Indian Coffees are earning high premium, particularly Indian Robusta which is highly preferred for its good blending quality. Arabica

Coffee from India is also well received in the international market. Coffee is an export product with low import intensity and high employment content. This is evident from the fact that more than six lakh persons are directly employed and an equal numbers of individuals get indirect employment from this sector.

The two main varieties of coffee viz., Arabica and Robusta are grown in India. Arabica is mild coffee, but the beans being more aromatic, it has higher market value compared to Robusta beans. On the other hand Robusta has more strength and is, therefore, used in making various blends. Arabica is grown in higher altitudes than Robusta. The cool and equable temperature, ranging between 15 degree Celsius to 25 degree Celsius, is suitable for Arabica while for Robusta, hot and humid climate with temperature ranging from 20 degree Celsius to 30 degree Celsius is suitable. Arabica requires more care & nurture and is more suitable for large holdings whereas Robusta is suitable irrespective of size of the farm. The harvest of Arabica takes place between November to January, while for Robusta it is December to February. Arabica is susceptible to pests & diseases such as White Stem Borer, leaf rust etc., and requires more shade than Robusta.

**Robusta production (MT) by states, 2017-18**



### Recent trends in coffee cultivation

Commercial plantations of coffee started in India during the 18th century. Over the years, the Indian coffee industry has earned a distinct identity on the coffee map of the world. India is the only country in the world where all coffees are grown under a 'well-defined two-tier shade canopy of evergreen leguminous trees'. India is today home to 16 unique varieties of coffees sourced from 13 distinct coffee growing regions; most of them in the southern part of the country. The different varieties of Indian coffees are well suited for cappuccinos and espressos alike and have no parallel in any other coffee growing nation globally. India's coffee regions are one of the 25 biodiversity hotspots in the world.

Coffee production in India grew rapidly in the 1950s, increasing from 18,893 tonnes in 1950-51 to 68,169 tonnes in 1960-61. Growth in India's coffee industry, however, has been especially robust in the post-liberalisation era, backed by the government's decision to allow coffee planters to market their own produce, rather than selling to a central pool. Coffee production in India stood at 316,000 metric tonnes (MT) in 2017-18. Robusta variety accounted for 221,000 MT (70 per cent) of this production, while Arabica accounted for 95,000 MT (30 per cent). India has emerged as the seventh largest coffee producer globally; after Brazil, Vietnam, Columbia, Indonesia, Ethiopia and Honduras. It accounted for 3.3 per cent of production and 5.4 per cent of global exports in 2017-18 (provisional estimates) as compared to 3.15 per cent and 3.57 per cent respectively in 1994-95.



The area under coffee plantations in India has increased by more than three times, from 120.32 thousand hectares in 1960-61 to 454.72 thousand hectares in 2017-18 (provisional). Most of this area is concentrated in the southern states of Karnataka (53.83%), Kerala (18.89%) and Tamil Nadu (7.83%). Productivity has also improved from around 567 kg/Ha in 1961 to around 765 kg/Ha during 2017-18. For the traditional areas, productivity has grown from 412 kg/Ha in 1961 to 886 kg/Ha in 2017-18. The industry is driven by the enterprise of around 280,241 coffee growers, out of which 99% are small growers, while 1% are medium to large growers. These plantations employ an average of around 659,865 people on a daily basis, as per provisional estimates for 2017-18.

### **Domestic market**

While coffee in India has traditionally been an export-oriented commodity, coffee planters in India are finding significant traction in the domestic market as well. India's domestic coffee consumption has increased steadily from around 50,000 MT in 1998 to 115,000 MT in 2011 (provisional estimates), registering a CAGR of 6.09%. This led to the setting up of a number of international and Indian coffee retail chains in the country in recent years like Lavazza, Café Coffee Day, Costa, Gloria Jean's Coffee, Coffee Bean & Tea Leaf and Starbucks.

Besides viewing India as a market, these chains are also recognising the fine quality and value proposition that is characteristic to India's coffee plantations; thanks to a rich legacy that spans more than four centuries. Consequently, they are also looking to develop a deeper and sustainable sourcing relationship with Indian coffee growers. India is witnessing a dramatic evolution of the coffee consuming culture across the Indian market.

The ecosystem from the farm to the cup is evolving at a rapid pace to address this cultural shift; an evolution that is getting further catalysed by the entry of international players. Apart from this, a number of homegrown entrepreneurs are emerging to help spread the coffee culture and transform the entire coffee experience in homes through provision of freshly roasted coffee beans, a range of distinguished varieties of coffee as well as coffee brewing equipment. The impact of this is expected to be particularly visible in North India, which has not been a traditionally coffee drinking market like South India.

### **REGIONAL RESEARCH STATIONS**

#### **COFFEE RESEARCH SUBSTATION, CHETTALLI, KODAGU, KARNATAKA.**

The station was established in 1946, in Cheralasrimangala village ( Near Chettalli ) of Kodagu district, which is one of the major coffee growing regions of the country. The station has a total area of 131 ha. of which 80 ha. is planted to coffee for conducting research experiments. It has a well equipped laboratory facility to pursue research in all the major disciplines.

**REGIONAL COFFEE RESEARCH STATION, CHUNDALE, KERALA**

Kerala is the second largest coffee producing state in the country predominantly planted to robusta. In order to develop appropriate technologies for robusta suited to this region, a regional research station was established during 1977-78 in an area of 116 ha. near Chundale village in Wayanad district of Kerala. The station has 30 ha. of coffee research farm supported by adequate laboratory facility to carry out research in various disciplines.

**REGIONAL COFFEE RESEARCH STATION, THANDIGUDI, TAMIL NADU.**

The coffee area in Tamil Nadu comes under the influence of North - East monsoon coupled with low rainfall and hence requires a separate set of package for coffee cultivation. To cater to the requirements of coffee growers of Tamil Nadu, a regional research station was established in an area of 12.5 ha. near Thandigudi village in Pulney hills of Tamil Nadu. The station has a research farm of 6.5 ha. and good laboratory facility for research activities.

**REGIONAL RESEARCH STATION, R.V. NAGAR, ANDHRA PRADESH**

The tribal areas in the eastern ghats of Andhra Pradesh and Orissa constitute the major non-traditional areas for coffee cultivation. Coffee was introduced in these areas mainly to develop the green forests covered in the barren hills affected by the destructive 'Podu' cultivation of the native tribes and to help in their socio-economical development. A regional station was established during 1976 near Chinthapalli in Vishakhapatnam district with an area of 60 ha. planted to coffee. The main mandate was to develop appropriate production technology in these areas. The station has adequate infrastructure to cater to the needs of the tribal growers.

**REGIONAL COFFEE RESEARCH STATION, DIPHU, ASSAM**

Coffee was introduced in the forest hills of North - east region of the country during 1980 mainly to protect the fragile ecosystem of the region by weaning away the native tribals from practicing the age-old shift cultivation ( Jhum ) and to provide them gainful employment. A regional station was established near Diphu in an area of 25 ha. to develop suitable production technology for coffee in the region.

**Road ahead**

The Indian coffee industry is largely export driven with more than 70% of the production being exported. Prior to 1996, the Coffee Board through two different auctions one each for domestic market and export market was marketing the entire coffee produced in the country. Under this arrangement the entire produce was collected through Coffee Board's Pool Depots and processed & stored in licensed coffee curing factories (secondary processing facilities). The coffees pooled to the Board's Depots were subjected to stringent quality control norms and payments were made to the growers based on cup quality. If the quality of a lot falls below Fair Average Quality (FAQ), such lots were penalized through appropriate deductions and coffees above FAQ were rewarded with premium points. This system greatly helped in the maintenance of quality both for domestic and export markets.

In line with the spirit of liberalization of the Indian economy initiated during the early 1990's, the Indian coffee industry was liberalized in a phased manner during 1993-96, wherein the growers were given absolute freedom to market their coffees on their own.

## Conclusion

Producing mould free coffee has become imperative to the coffee growers of the country as the export market threshold levels for mould contamination is being lowered. International quality standards for coffee have been raised to reduce the permissible limit for OTA contamination and all the producing countries are left with no alternative but to fall in line with the international standards. This calls for a comprehensive effort that spans all stages of production right from the post harvest stage up till it is exported. However, the earlier stages of the supply chain appear to be more critical while the later stages call for follow-up action of maintenance in nature. The general quality improvement depends on a collective approach between stakeholders in the commodity chain since each has responsibilities at each stage. Within a given type of stakeholders, a coffee batch may consist of a multitude of individual contributions. It can be done by educating the farmers on the practices of production of mould free coffee, through training programmes and distribution of literature and make stakeholders in the coffee chain aware of the significance of the WTO agreements on food safety regulation in international trade.

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