



COFFEE CULTIVATION SCENARIO IN INDIA IN WORLD RESPECT: A REVIEW

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ABSTRACT

In India, coffee has a place of pride among plantation crops grown and is traditionally cultivated on the south-western hill slopes under monsoon rainfall conditions, is also termed as "Indian monsooned coffee" since 150 years. Indian coffee is said to be the finest coffee grown in the shade rather than direct sunlight anywhere in the world. The two well known species of coffee grown are the Arabica and Robusta. The first variety that was introduced in the Baba Budan Giri hill ranges of Karnataka in the 17th century was marketed over the years under the brand names of Kent and S.795. 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. Arabica 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. Export earnings have increased from Rs 2070.68 crore in 2009-10 to Rs 6210.23 crore in 2017-18. Italy was the largest export market for Indian coffee, importing 80,099 MT (20.28% of India's total exports) in 2017-18. Coffee research and development efforts are well organised in India through its Coffee Research Institute, which is considered the premier research station in South East Asia. It is under the control of the Coffee Board of India, an autonomous body, under the Ministry of Commerce and Industry, Government of India. There are many problems in Indian coffee production and distribution; therefore needs more suitable govt. policy measures, research, development and extension activities to augment coffee production, distribution and export as well as making people (especially coffee cultivators) more aware on coffee cultivation.

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INTRODUCTION

In India, coffee (Botanical Name: *Coffea arabica*, *Coffea robusta*; Family: Rubiaceae) has a place of pride among plantation crops grown and is traditionally cultivated on the south-western hill slopes since 150 years. Although coffee is not an essential commodity for human consumption, its stimulating properties are too well known to ignore its importance in human health, if taken at moderate levels. As history indicates, the commercial cultivation of coffee in India was started during early 19th century by the European entrepreneurs. Indian coffee is said to be the finest coffee grown in the shade rather than direct sunlight anywhere in the world. As of 2009, Indian coffee made up just 4.5% of the global production.

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Almost 80% of Indian coffee is exported; 70% is bound for Germany, Russia, Spain, Belgium, Slovenia, United States, Japan, Greece, Netherlands and France. Most of the export is shipped through the Suez Canal. Indian coffee, grown mostly in southern states under monsoon rainfall conditions, is also termed as "Indian monsooned coffee". Indian coffee is the most extraordinary of beverages, offering intriguing subtlety and stimulating intensity. India is the only country that grows all of its coffee under shade. It is often said, the Indian coffee grower pours his life into the crop. Is it any wonder then that India has consistently produced and exported a remarkable variety of high-quality coffees for over one hundred and fifty years!

History of coffee cultivation in world: - Coffee growing has a long history that is attributed first to Ethiopia and then to Arabia (Yemen). The earliest history is traced to 875 AD according to the Bibliotheque Nationale in Paris, and the

original source to Ethiopia (Abyssinia) from where it was brought to Arabia in the 15th century. Kaffa province in Ethiopia is the birthplace of coffee. It was discovered by a shepherd Kaldi who noticed his goats prancing about restlessly after eating the leaves of the coffee plant.

History of coffee cultivation in India:-In the Indian context, coffee growing started with an Indian Muslim saint, Baba Budan, who, while returning from a pilgrimage to Mecca and from there to Mocha – a port city in Yemen and a major coffee hub and smuggled seven coffee beans (by hiding them in his beard) from Yemen to Mysore in India. He planted them on the Chandragiri Hills (1,829 metres), now named after the saint as Baba Budan Giri in Chikkamangaluru district. It was considered an illegal act to take out green coffee seed out of Arabia. As number seven is a sacrosanct number in Islamic religion, the saint's act of carrying seven coffee beans was considered a religious act. This was the beginning of coffee industry in India, and in particular, in the then state of Mysore, now part of the Karnataka State. This was an achievement of considerable bravery of Baba Budan considering the fact that Arabs had exercised strict control over its export to other countries by not permitting coffee beans to be exported in any form other than as in a roasted or boiled form to prevent germination. Systematic cultivation soon followed Baba Budan's first planting of the seeds, in 1670, mostly by private native Indian owners and the first plantation was established in 1840 around Baba Budan Giri and its surrounding hills in Karnataka and from there it spread to other areas.

Area: - The main coffee producing states of India is Karnataka. It was especially popular in the southern states of Andhra Pradesh, Karnataka, Kerala and Tamil Nadu. The most commonly used coffee beans are Arabica and Robusta grown in the hills of Karnataka, Kerala and Tamil Nadu. According to the 2008 statistics published by the Food and Agriculture Organization (FAO), the area of coffee green harvested in India was 342,000 hectares, with yield estimates of 7,660 hectogram/ha, forming a total production estimate of 262,000 tonnes. There are approximately 250,000 coffee growers in India; 98% of them are small growers. Over 90 percent of them are small farms consisting of 10 acres (4.0 ha) or fewer. 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.

Distribution:-Coffee is the second most important beverage crop of India next only to tea. Coffee production in India is dominated in the hill tracts of South Indian states, with Karnataka accounting for 71%, followed by Kerala with 21% and Tamil Nadu (5%). Coffee is grown in three regions of India with Karnataka, Kerala and Tamil Nadu forming the traditional coffee growing region, followed by the new areas developed in the non-traditional areas of Andhra Pradesh and Orissa in the eastern coast of the country and with a third region comprising the states of Assam, Manipur, Meghalaya, Mizoram, Tripura, Nagaland and Arunachal Pradesh of Northeastern India, popularly known as "Seven Sister States of India".

Varieties:- In the 1920s, the earliest variety of Arabica grown in India was named Kent(s) after the Englishman L.P. Kent, a planter of the Doddengudda Estate in Mysore.

Arabica varieties:-Sln 795, Kent, Sln 7, Sln 9, Sln 10, Cauvery and its selections, Chandragiri and san Roman

Robusta varieties:-Sln 274, Sln 270, Sln 3. CxR

- Major Arabica producing regions include Anamalais, Bababudangiris, Biligiris, Araku Valley, Brahmaputra, Shevaroy, and Pulneys
- Major Robusta producing regions include Wayanaad (largest producer of Robusta) and Travancore.

In addition, Coorg, Chikmagalur, Nilgiris and Manjarabad are famous for both the Arabica and Robusta varieties.

Types of Coffee:-There are basically two types of coffee consumed most commonly worldwide - Arabica and Robusta - that grow from the two main species of coffee plants: *Coffee Arabica* and *Coffee Robusta* respectively. Although there are numerous varieties of coffee plants, Arabica and Robusta are the most important from a commercial standpoint.

Arabica Coffee:-Arabica coffees have a delicate flavour and balanced aroma coupled with a sharp and sweet taste. They have about half the amount of caffeine compared to Robustas.

Robusta Coffee:-Robusta coffees have twice the level of caffeine compared to Arabicas. Robusta coffees have a very strong taste, a grainy essence and an aftertaste somewhat similar to that of peanuts. It is possible to grow this variety at lower heights. Robustas have a better yield and take less time to bear fruit than Arabicas. Although the Arabica variety is preferred in international markets, high quality Robustas are also highly preferred due to their strong taste.

Major Regions of Coffee Cultivation:-South India dominates the other states in coffee plantation, Hills of Western ghats receive plenty of rainfall during the monsoon season which makes these region best place for coffee cultivation.

Chikmagalur:-Chikmagalur is first place in India where coffee was introduced, It is also known as coffee land of Karnataka. Wayanad-The green paradise of Malabar region,Wayanad is located between the mountains of the majestic Western Ghats. Wayanad is the one of the best hill station of Kerala.

Yercaud:-The small and young hill station of Tamil Nadu is located in the Salem District. Yercaud is situated in the Shevaroy range of hills in the Eastern Ghats.

Araku:-Araku is a hill station in Visakhapatnam district of Andhra Pradesh, in the Eastern Ghats. Coffee cultivation industry is secondary here, as pepper and rubber are cultivated by the tribal all around the state.

Daringbadi:-Daringbadi is known as Kashmir of Orissa, located in the hill region of Orissa and the only hill station of state.

Cultivation

Soil: - Soil should be deep, friable, open textured rich in plant nutrients with plenty of humus and of slightly acidic nature (pH – 4.5 to 6.5).

Seeds:- Coffee is propagated by seeds.

Sowing Season:-Planting spreads from June – December

Preparation of seeds:-Healthy and well developed fully ripe berries are harvested from specially identified plants for use as seed bearers. After discarding the floats, the sound fruits are depulped, sieved and mixed with sieved wood ash and dried in shade. The seed is then graded to remove all cut, triangular and elephant beans. Prior to planting, the seeds are treated with Agrosan or any Organomercurial compound to prevent fungal infection.

Nursery practices:-Select light loamy soil of good drainage with high organic matter content with water and shade facilities. Form raised beds of 15 cm height, 1m width and at convenient length. Incorporate 30 - 40 kg of well rotten compost, 2 kg of finely sieved agricultural lime and 400 g of rock phosphate to a bed of 1 x 6 m size. In heavy soils, it is necessary to add coarse sand for drainage and aeration.

Sowing:- Pre-sowing seed treatment with *Azospirillum* and *Phosphobacterium* can be done. Seeds are sown in December - January in the bed 1.5 - 2.5 cm apart with the flat side down wards in regular rows. Then they are covered with a thin layer of fine soil and a layer of paddy straw. Water the beds daily and protect from direct sunlight by an over head pandal. Seeds germinate in about 45 days after which they are transplanted to a secondary nursery beds for raising ball or Bag nursery.

Bag nursery:-Polythene bags with adequate number of holes in the bottom half are taken and are filled with a prepared mixture containing jungle soil, FYM and sand in the proportion of 6:2:1. An area of 12 x 8 m can accommodate 5000 seedlings. Seedlings are planted in polythene bags.

Preparation of field:-Selective felling may be done while retaining a number of desirable shade trees. Terracing should be done in deep slopy areas. After the summer showers, pits of 45 cm x 45 cm x 45 cm are dug at 1.25 - 2.5 m apart. The pits are left open for weathering and then filled and heaped for planting. At the time of filling, apply 500 g of rock phosphate per pit along with top soil. Planting is done along the contour in slopy areas.

Spacing –(a) Arabica Coffee :-1.5 to 2.0 m either way. (b) Dwarf varieties:-Sanraman: 1 x 1 m. (c) Robusta coffee:-2.5 m either way.

After cultivation:- Weeding and mulching should be done as and when necessary. Digging is done to a depth of 30 cm towards the end of monsoon (October - November). The weeds and vegetative debris are completely turned under and buried in the soil while the stumps are removed. This is known as the cover digging. In slopy areas dig trenches on the contour 45 cm wide and 30 cm deep of any convenient length. Prune water shoots and disease affected shoots.

Major Pests and Diseases

Coffee Berry Borer:-The coffee berry borer (*Hypothenemus hampei*) is the most serious pest of coffee in many of the major coffee-producing countries in the world.

Coffee Leaf Miner:-The coffee leaf miner (*Leucoptera coffeella*) is a moth whose larvae feed inside the leaf tissue and consume the palisade parenchyma.

Root-knot Nematodes :- Root-knot nematodes (*Meloidogyne spp.*) have become a major threat in all C. arabica-growing regions of the world.

Coffee Leaf Rust:-Coffee leaf rust caused by the obligate parasitic fungus (*Hemileia vastatrix*) causes considerable economic losses to coffee producers, especially with C. arabica, and is currently found in all coffee-growing regions of the world.

Coffee Berry Disease:-Coffee berry disease caused by the fungus (*Colletotrichum kahawae*).

American Leaf Spot:-American leaf spot, caused by the fungus (*Mycena citricolor*).

Coffee Wilt Disease:- Coffee wilt disease (*Gibberella xylarioides*) is a vascular fungal disease.

Harvest:-Harvest starts during November and harvesting extends up to February. Coffee fruits should be harvested as and when they become ripe. Coffee is just ripe when on gently squeezing the fruits the beans inside come out easily. Unripe fruits should be scrupulously sorted out before using the fruits for pulping. They may be dried separately as cherry.

Yield:-750 - 1000 kg dry parchment /ha

Growing Conditions:-India cultivates all of its coffee under a well-defined two-tier mixed shade canopy, comprising evergreen leguminous trees. Nearly 50 different types of shade trees are found in coffee plantations. Shade trees prevent soil erosion on a sloping terrain; they enrich the soil by recycling nutrients from deeper layers, protect the coffee plant from seasonal fluctuations in temperature, and play host to diverse flora and fauna. Coffee plantations in India are essential spice worlds too: a wide variety of spices and fruit crops like pepper, cardamom, vanilla, orange and banana grow alongside coffee plants. India's coffee growing regions have diverse climatic conditions, which are well suited for cultivation of different varieties of coffee. Some regions with high elevations (1000-1500m) are ideally suited for growing Arabicas of mild quality while those with warm humid conditions are best suited for Robustas. 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. 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.

Production:-Coffee production in India grew rapidly in the 1950s, increasing from 18,893 tonnes in 1950-51 to 68,169 tonnes in 1960-61. 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. India produces about 2.5 per cent of world's coffee on almost the same percentage of coffee plantations.

Consumption

Table 1 Domestic consumption of coffee

Calendar Year	Quantity (in MT)
2000	60,000
2001	64,000
2002	68,000
2003	70,000
2004	75,000
2005	80,200
2006	85,000
2007	90,000
2008	94,400
2009	102,000
2010	108,000
2011	115,000

Trade and Export: 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. 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.

Table 2 Export of coffee from India to top 10 countries in 2017-18

Destination	Quantity (in MT)	Unit value in Rs/tonne
Italy	80,099	141,547
Germany	39,233	161,354
Russian Federation	26,418	171,756
Belgium	18,126	205,908
Turkey	15,951	170,688
Poland	13,709	158,771
USA	13,405	104,981
Indonesia	12,344	137,953
Jordan	11,162	175,108
Libya	10,545	144,861

Source: Coffee Board

Popularity: The India Coffee House chain was first started by the Coffee Board in early 1940s, during British rule. In the mid-1950s, the Board closed down the Coffee Houses, due to a policy change. The first Indian Coffee House was opened in New Delhi on 27 October 1957. Gradually, the Indian Coffee House chain expanded across the country. In the Indian home, coffee consumption is greater in south India than elsewhere.

Indian coffee has a good reputation in Europe for its less acidic and sweetness of character and thus widely used in Espresso Coffee, though Americans prefer African and South American coffee, which is a more acidic and brighter variety. Selection 9 was the winner of the Fine Cup Award for best Arabica at the 2002 Flavour of India – Cupping Competition. In 2004, Indian Coffee with the brand name "Tata Coffee" had the distinction of winning three gold medals at the Grand Cus De Café Competition held in Paris.

Coffee Cultivation Culture Unique to India: Coffee has been cultivated in India since the 17th century and has become one of the prominent plantation crops in India. The way India grows coffee is unique – under a canopy of different varieties of shade trees which ensures that the canopy of tree cover is always maintained. These shade trees (usually in 2 tiers) provide an unique microclimate which enables it to sustain a wide variety of flora & fauna. Infact very few countries have this type of “shade tree micro environment”. This biodiversity available in Indian coffee plantations is quite simply phenomenal and Indian Coffee scores high on all environmental friendly parameters when compared to not only coffee grown in other countries but also across all other farming/ crop systems (agricultural crops like paddy, wheat, cotton, sugarcane or other plantation crops like tea, arecanut etc). India is also unique in that both the varieties of coffee – Arabica & Robusta are grown. 70 % of our coffees are exported and almost all is at a premium. This is again unique when compared to other products exported from India which is usually at a discount.

Specialty Coffees

Regional logos and brands include: Anamalais, Araku valley, Bababudangiris, Biligiris, Brahmaputra, Chikmagalur, Coorg, Manjarabad, Nilgiris, Pulneys, Sheveroys, Travancore, and Wayanad. There are also several specialty brands such as Monsooned Malabar AA, Mysore Nuggets Extra Bold, and Robusta Kaapi Royale.

Monsooned Malabar AA: Centuries ago, when coffee beans were transported to Europe in sailing ships, a ‘wonderful’ accident occurred. Monsoon winds caused the beans to swell, change colour and acquire an intensely-mellow flavour that won connoisseurs over. Today, this magic is recreated by ‘monsooning’ the finest Arabica beans to produce a world-famous specialty coffee.

Mysore Nuggets Extra Bold: The might and grandeur of the monolithic Nandi bull statue on Chamundi Hills of Mysore, is reflected in these large, exotic Arabica beans that make this rare, premium specialty coffee, a connoisseur’s delight.

Robusta Kaapi Royale: The stately elephant with its howdah - a canopied seat bedecked with flowers and jewels used during a ceremonial procession – is a sign of Indian royalty. Much like this king of specialty Indian ‘kaapis’, prepared from bold Robusta beans of the best quality. The beans are bold, round with pointed ends, and grey to bluish-grey in colour. The cup ensures full body, soft, smooth and mellow flavour.

Factors of coffee production: Coffee is an extremely important agricultural commodity, produced in about 80 tropical countries, with an estimated 125 million people depending on it for their livelihoods. Coffee genetic resources are being lost at a rapid pace due to varied threats, such as human population pressures, leading to conversion of land to

agriculture, deforestation, and land degradation; low coffee prices, leading to abandoning of coffee trees in forests and gardens and shifting of cultivation to other more remunerative crops; and climate change, leading to increased incidence of pests and diseases, higher incidence of drought, and unpredictable rainfall patterns. All these factors threaten livelihoods in many coffee-growing countries.

Research and development:-Coffee research and development efforts are well organised in India through its Coffee Research Institute under the control of the Coffee Board of India under the Ministry of Commerce and Industry, Government of India with the objective of promoting “research, development, extension, quality up gradation, market information, and the domestic and external promotion of Indian coffee.” It was established near Balehonnur in Chikmagalur district of Karnataka, in the heartland of coffee plantations. Prior to establishing this institute, a temporary research unit was established in 1915 at Koppa primarily to evolve solutions to crop infestation by leaf diseases. This was followed by the field research station established by the then Government of Mysore, titled "Mysore Coffee Experimental Station," in 1925. This was handed over to the Coffee Board which was formed in 1942, and regular research started at this station from 1944. The Board serves as a friend, philosopher and guide of the coffee industry in India. Chikmagalur district, the headquarters of the Coffee Board of India, shown within the state of Karnataka. The research activities covered by the Institute constitute with the basic aim of increasing productivity and quality of coffee grown in India. In addition, crop diversification with crops such as pepper and areca are also part of income generating programmes of the institute. Training of personnel is an important activity of the institute. The institute is also providing training to foreign nationals on coffee cultivation. The Coffee Board of India maintains a Quality Control Division in its head office in Bengaluru.

Regional research stations:-To cover research specific to each coffee growing region covering different agro-climatic conditions, the following five research stations are fully functional under the overall control of the Central Coffee Research Institute.

Table 3 Regional research stations

CRSS /RCRS	State	Year of establishment	Purpose
Chettalli in Kodagu district (CRSS)	Karnataka	1946	One of coffee research centers concentrating on the cultivation and diseases of coffee.
R.V. Nagar in Visakhapatnam district (RCRS)	Andhra Pradesh	1976	to cater to the development of coffee in non-traditional areas. Covering state of this regional station-Orissa.
Chundale village in Wayanad district (RCRS)	Kerala	1946	to develop appropriate technologies to suit the region where robusta is the dominant crop.
Thandigudi in Dindigul district (RCRS)	Tamil Nadu	1946	the sole aim of evolving suitable practices for the cultivation of coffee area in Tamil Nadu
Diphu in Karbi Anglon district (RCRS)	Assam	1980	to support coffee plantations which were established in the Northeast region and to provide an alternate, economically viable agricultural practice to the shifting or jhum cultivation.

(RCRS: - Regional Coffee Research Station; CRSS- Coffee Research Sub-station)

Coffee Board of India:-The Coffee Board of India is an organization managed by the Ministry of Commerce and Industry of the government of India to promote coffee production in India. The board was set up by an act of parliament in 1942. Until 1995 the Coffee Board marketed the

coffee of many growers from a pooled supply, but after that time coffee marketing became a private-sector activity due to the economic liberalization in India. The Coffee Board's traditional duties include the promotion, sale and consumption of coffee in India and abroad; conducting coffee research; financial assistance to establish small coffee growers; safeguarding working conditions for labourers, and managing the surplus pool of unsold coffee.

Key approach area

Better Farming: Increasing the use of best farming practices by providing farmers with intensive, field-based agronomy and business training using local trainers

Better Processing: Improving the quality of farmers' coffee at the processing level by supporting the establishment and management of processing businesses

Better Supply Chains: Developing lasting market linkages and advancing sector growth by engaging with industry players to share learnings and align priorities

Better Environmental & Social Standards: Pioneering simple, cost-effective solutions for a direct, environmentally sustainable, and financially transparent coffee sector

Table 4 Coffee cultivation in major countries of world

Sl.	Countries in different continent					
	Asia	Africa	Europe	North America	South America	Oceania
1	India	Ethiopia	Spain	Mexico	Brazil	Australia
2	Yemen	Angola		Antigua	Argentina	
3	Sri Lanka	Uganda		Salvador	Colombia	
4	Indonesia	Cape Verde Is.		Guatemala	Paraguay	
5	Mayanmar	Madagascar		Haiti	Chile	
6	Philippines	Liberia		Cuba	Bolivia	
7	Vietnam	Eritrea		Dominican Republic	Peru	
8		Sao Tome & Principe Is.		Costa Rica	Ecuador	
9		Congo		Nicaragua	Gayana (French)	
10				Porto Rico (USA)		

Table 5 Top ten coffee producers

Country	Production (1,000 60-kg bags)	Percent of World Production	Percent of World Exports
Brazil	43,235	30.17	30.53
Vietnam	27,500	19.19	20.50
Colombia	13,500	9.42	10.75
Indonesia	12,317	8.60	5.20
Ethiopia	6,700	4.68	2.70
India	5,833	4.07	5.37
Honduras	5,750	4.01	5.09
Uganda	4,755	3.32	3.02
Guatemala	3,400	2.37	2.61
Peru	3,300	2.30	2.44
Total World Production & Export	143,306	88.17	88.21

Table 6 Top ten coffee importers

Country	Imports (1,000 60-kg bags)	Percent of Global Imports
United States	27,016	23.14
Germany	21,174	18.13
Italy	8,823	7.56
Japan	8,381	7.18
France	6,713	5.75
Belgium	5,502	4.71
Spain	5,137	4.40
Russian Federation	4,410	3.78
United Kingdom	4,206	3.60

Netherlands	3,407	2.92
Total World Imports	116,773	81.17

Environmental sustainability:- Due to increasing population pressures and accompanying deforestation and land degradation, natural forest ecosystems housing high levels of biodiversity are under serious threat in the centers of origin of various *Coffea* spp. in Africa. Despite coffee's importance, coffee exports from Africa have steadily declined, leading to food insecurity among resource-poor, small-scale farmers. The reasons for the decline include market volatility, inadequate market access, inefficient policy frameworks, inadequate access to improved technologies and services, lack of incentives, and climate-associated risks. Although coffee is predominantly grown in mixed-crop, agro-forestry systems promoting conservation and organic farming, the demand for high-quality coffees resulted in increased costs of production and processing that are beyond the capacity of most coffee farmers in Africa. In addition, the coffee marketing system and sharing of benefits has to pass through a complex value chain. Coffee production in an agro-forestry system, a system involving production of coffee under the shade of diverse canopy species, has great conservation potential. It was also recommended advocating shade-grown coffee to agricultural planners and policymakers in developing countries as an option for a positive correlation between conservation and the marketplace. There is an urgent need to mitigate the negative impacts of climate change on coffee production by maintaining quality environments through minimization of deforestation and forest degradation. To ensure success of environmental sustainability and biodiversity conservation, measures delivering incentives and equitable benefit sharing from the use of forest genetic resources and the ecosystem services, such as premium prices for quality coffees, should be addressed. In addition, institutional and project-based initiatives launched by industry, NGOs, and governments add to the confusion and are limited in their ability to address macroeconomic problems and lack consistency across initiatives. Hence, clear, transparent, and flexible sustainability criteria need to be established with a multistakeholder mechanism for establishing and administering the implementation at the international level. This will ensure a trade-neutral path toward sustainable development within the coffee sector and better collaboration and coordination between existing initiatives.

Future strategy:- Coffee genetic resources are under threat due to loss of the forest ecosystems housing these valuable gene pools. Some of the threats contributing to the erosion of coffee genetic diversity include human population pressures, volatile coffee markets, and global climate change. Conservation of coffee germplasm as seeds is not a viable option due to the recalcitrant/intermediate storage behavior of seeds. Hence, coffee is conserved in field gene banks.

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Conservation of coffee genetic resources should take into account complementary methods of *in situ* (in their natural habitat) and other *ex situ* (outside their natural habitat) conservation methods. The urgent need to develop a comprehensive strategy for the conservation of coffee genetic resources through a thorough evaluation of existing germplasm. It was identified a comprehensive strategy that will sustain biodiversity, ecosystem services, and livelihoods in the face of climate change. The strategy includes promotion of biodiversity-friendly coffee-growing and coffee-processing practices, incentives for forest conservation and restoration, diversification of revenue sources, integrated fire management, market expansion to develop a demand for sustainably produced coffee, crop insurance programs for smallholder farmers, and strengthening capacity for adaptive resource management. The global strategy aims to ensure the conservation and use of coffee genetic resources for a positive, sustainable future of the crop and for those dependent on coffee for a livelihood. The strategy will act as a framework for bringing together stakeholders at all levels-local, regional, national, and global-in building awareness, capacity, and engagement in conserving the genetic diversity and use of coffee genetic resources for the long term

CONCLUSION

India is an agrarian country. Major occupation of majority of the people is farming. Farming is our base of economy, life, livelihood and culture. Therefore, for employment generation, prevent disguised employment in agriculture, supporting crop diversification and earning more by exporting coffee, coffee cultivation has prime importance in Indian agriculture. In this respect, more sensitive govt. policy measures are needed to solve the various problems as well as research and development activities are to be emphasized to popularize coffee cultivation in India. Overall, making people more aware on importance of coffee cultivation in India, arena of extension activities are to be extended further as much as possible. Above all, coffee has high demand in national and international market, therefore, if suitable measures are taken to cultivate coffee in Indian diaspora, it will provide a suitable enterprise by those, farmers will be benefitted as well as country's economy will get a boost.

Reference

1. www. Coffee cultivation in India
