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2020-21 – A PERSPECTIVE VIEW

Its my immense pleasure to release the 81st Annual Report of Coffee Board for the year 2020-2021.

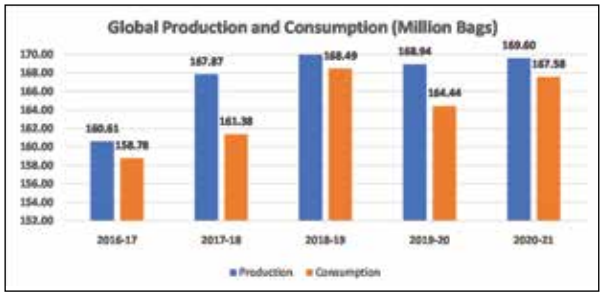
Coffee is the world's favourite beverage with an estimated 3 billion cups relished every day- either alone or with family, friends or colleagues and on the other hand, Coffee provides livelihoods for at least 100 million people, across Coffee producing countries. Traditionally, Coffee has been considered as a tropical commodity that links producing countries in the global South, along the so-called 'bean belt' that lies between the Tropics of Cancer and Capricorn, with consuming countries in the global North. Coffee is grown in more than 70 developing countries across the globe. The top five Coffee producing countries *viz*., Brazil, Vietnam, Colombia, Indonesia and Ethiopia accounts for more than 70% of the global production. India is the 7th largest producer of Coffee in the world with the share of about 3.30% in the global production.

Coffee is predominantly an export oriented commodity for the producing countries. India is the sixth largest exporter of Coffee in the world with the share of about 5% in global exports. Indian high quality Coffees has created a niche for itself and earning high premiums in the international markets, especially Robusta which is highly preferred for its good blending quality. In recent years, the Coffee growing sector in the country is facing severe crisis situation as the Coffee growing regions of Karnataka and Kerala has received heavy incessant rains with gusty wind leading to floods / landslides. Added to this the Coffee prices are highly volatile and showing declining trend since 2012. As per the International Coffee Organization, the annual average of the composite indicator price declined by 48.70% to 107.94 US cents/lb in 2020 compared to annual average composite indicator price of 210.39 US cents/lb during 2011. On the other hand, the production costs are going up in the recent years in major Coffee growing regions mainly due to increase in labour wages and cost of inputs. Further, the COVID-19 pandemic outbreak came at the unfortunate time as the Indian Coffee-growers were already reeling under the impact of low prices, rising input costs and an erratic weather pattern. Besides, the COVID-19 pandemic affected the Coffee exports mainly on account of disruptions in global logistics, shortage of containers,high freight costs and postponement of shipment orders.

Global Coffee Production and Consumption

According to the International Coffee Organization, global production for Coffee year 2020-21 is estimated at 169.60 million bags, representing a 0.4% increase on 168.94 million bags in 2019-20. World consumption for Coffee year 2020-21 is projected at 167.58 million bags, an increase of 1.9% on its level of 164.44 million bags in Coffee year 2019-20. The year 2020-21 experienced with limited global demand due to COVID-19 pandemic related restrictions, social distancing measures,

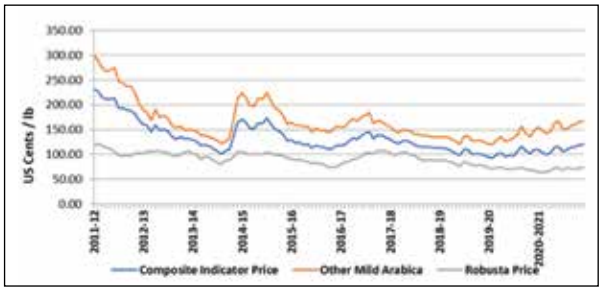
limiting out-of-home consumption, and slow pace of global economy recovery. However, with the easing of COVID-19 pandemic related restrictions and the subsequent prospects of economic recovery, consumers are regaining confidence leading to a positive trend of world Coffee consumption.



Source: International Coffee Organization

International Price

The world Coffee price is predominantly determined by fundamental factors like global supply, demand and stock movements. Non fundamental factors like fluctuations in exchange rates and trading activities in Coffee futures markets can intensify the price volatility. During 2020-21, the ICO composite indicator price rose by 8.8% to 111.07 US cents/lb over 102.04 US cents/lb in 2019-20. The price performance has been driven by an expected reduction in production in key exporting countries like Brazil for the 2021-22 season. Besides, the brighter prospects for demand as the COVID-19 pandemic related lockdown measures are being removed in major consuming markets with the COVID-19 vaccine programmes and greater confidence of consumers in economic recovery. The prices of other mild Arabicas (the category in which the Indian Arabicas are classified in the International market) have recorded a substantial increase. During the year, prices for Other Milds increased by 16% to 156.44 US cents/lb compared to 134.90 US cents/lb in 2019-20. The prices for Other Milds ranged between 141.52 US cents/lb and 167.05 US cents/lb. While, price for the Robusta indicator recorded a decrease of 2.3 % to 69.74 US cents/lb compared to 71.41 US cents/lb in 2019-20. The indicator prices for Robusta ranged between 63.97 US cents/lb and 73.86 US cents/lb.



Indian Scenario

During the year 2020, the receipt of blossom and backing showers was satisfactory in all the Coffee growing tracts of the Traditional Areas. The monsoon helped in maintaining the soil moisture and in vegetative growth of the Coffee plants. However, the unprecedented rains received during the month of August/ September 2020 & January 2021 has led to substantial crop losses, flooding and landslides in the traditional Coffee growing states.

The COVID-19 pandemic had a profound impact on plantation sector including production. About 30 to 40% of labour shortage was experienced especially during

the harvesting season resulting in increased cost for harvesting. The problem was more in big plantations resulting in delay in harvesting. This has resulted in over ripening of berries which in-turn affected the quality.

Production and Exports

Final estimate of Coffee production for 2020-2021 was placed at 3,34,000 MT, comprising of 99,000 MT of Arabica and 2,35,000 MT of Robusta, which is an increase of 12% over previous year's (2019-20) production of 2,98,000 MT comprising of 87,000 MT of Arabica and 2,11,000 MT of Robusta.

During 2020-2021, export permits for export of 3,10,692 MT of Coffee (including 77,390 MT of re-exports) were issued valued at ₹5,452 crores equivalent to US$ 735 million with a unit value realization of ₹1,75,477 per MT. During the year 2019-20, export permits were issued for export of Coffee to the tune of 3,27,413 MT valued at ₹5,215 crores equivalent to US$ 736 million with a unit value of ₹1,59,268 per MT. During 2020-2021, export permits were issued for export of Coffee to 125 countries out of which Italy, Germany, Belgium, Russian Federation, and Poland were the top five importing countries.

Domestic Price

As per the prices prevailed in the auctions conducted by Indian Coffee Trader Association (ICTA), the domestic market. price of Arabica (Plantation 'A') ranged from ₹250/Kg to ₹299.33/Kg with an average of ₹281.23/ Kg which is about 19.39% higher than the price that prevailed during the previous year (₹235.55/Kg) and the Robusta (Cherry 'AB') price ranged from ₹124/Kg to ₹134.67/Kg with an average of ₹130.63/Kg which is an decrease of 6.08% over the price prevailed during the previous year (₹139.09/ Kg).

Auction Prices - Average prices secured in ICTA (Bengaluru) [₹/Kg]

Financial Year	2016-17	2017-18	2018-19	2019-2020	2020-21
Plantation 'A'	225.37	205.02	192.50	235.55	281.23
Robusta Cherry 'AB'	133.18	125.43	137.20	139.09	130.63

Domestic consumption

The average growth rate of domestic Coffee consumption for all Coffee exporting countries is 2.1 per cent while the consumption in India is growing at 3 to 4 per cent. Though the growth rate of domestic Coffee consumption in India is above the exporting countries average, in absolute Coffee consumption, India is lower than most of the major Coffee exporting countries. Presently, the domestic

consumption is estimated at 1,15,000 MT. For the long-term sustainability of the industry, the growth of domestic consumption increases steadily besides realization of better Coffee prices. This will provide a shield to the growers against volatile Coffee prices, provide excellent employment opportunities, encouraging entrepreneurship and overall improvement in the value chain. To support the growing market, the Board has initiated several steps which includes skill development programmes such as Kaapi Shastra, Barista Skills, Entrepreneurship development and Coffee retailing as well as extending support for roasting, grinding and packaging segment to individual units and self-help groups / growers' collectives /cooperatives under the component 'Support for Value Addition'.

Export Promotion

During 2020-21, due to global COVID-19 pandemic, the Coffee Board has not participated in any of the physical events for export promotion. Alternatively, the Coffee Board has organized the Coffee promotion programmes, Buyer Seller Meeting and Business network meet through virtual platform. These virtual trade promotion events helped the exporters to reach the global market and to reach a much larger buyers in the importing countries around the world. Coffee Board made efforts for large-scale participation of Indian Coffee exporters and specialty Coffee growers in all the overseas virtual events. Further, in order to boost promotion of Indian Coffees, Board introduced corporate gift boxes containing high quality GI and other regional specialty Coffees for giving away to VIPs and dignitaries in all overseas events and promotion through Indian Missions in major importing countries. As a part of Board's participation in global events in-association with Indian Missions, Board is updating country wise database / contact information of Importers and Roasters. In order to facilitate the Coffee exports during COVID-19 pandemic, Coffee Board has implemented online issuance of export documents with digital signature *viz.,* RCMC, export permit and ICO Certificate of Origin.

Coffee Research

The Coffee Board Research Department has implemented a number of research programs during the year 2020-21 under the programme 'R & D for Sustainable Coffee Production and Transfer of Technology'. The research projects are implemented through a network of Research Stations mainly at Central Coffee Research Institute (CCRI), Chikkamagaluru, Karnataka and its Regional Stations located at Chettalli (Kodagu, Karnataka), Chundale (Wayanad, Kerala), Thandigudi (Pulneys, Tamil Nadu), R. V. Nagar (Visakhapatnam District, Andhra Pradesh), and Diphu (Karbi Anglong District, Assam) and also the Plant Tissue Culture and Biotechnology Centre, Mysuru and Coffee Quality Division, Bengaluru.

Projects are also implemented in collaboration with International Institutes like M/s Nestle R & D France and World Coffee Research, USA and also with National Institutes like University of Agricultural Sciences,

Bengaluru, Tamil Nadu Agricultural University, Coimbatore, National Bureau of Plant Genetic Resources (NBPGR), New Delhi, and PPV & FRA Authority, New Delhi. CCRI also have collaborative research programmes with private entrepreneurs like Jain Irrigation Systems Ltd, Jalgaon, Maharashtra.

Coffee Board Programmes

During the year, the Board continued to implement the XII plan scheme "Integrated Coffee Development Project" under the Medium Term Framework period with major activities *viz.,* Research & Development, Transfer of Technology, Capacity Building programme, Development Support to stakeholders *viz.,* development support for Coffee in Traditional Areas, development support for Coffee in Non-Traditional Areas (NTA), development support for Coffee in North-East Region (NER), welfare support to children of labourers, Export promotion and support for value addition for improvement of production, productivity, quality of Coffee and increase overall value realization.

Other Initiatives

- **Establishment of Atal Incubation Centre at Coffee Board:** Coffee Board has established an Atal Incubation Centre - Central Coffee Research Institute – Centre for Development (AIC-CCRI-CED) under Atal Innovation Mission (AIM) of NITI Aayog with a grant-in-aid of ₹9.97 Crore over a period of 5 years. The AIC-CCRI-CED is expected to offer business incubation services to startups in Coffee and allied sectors. Presently, AIC-CCRI-CED has on board 22 Incubatees & 25 Incubatees targeted by the end of March 2022.
- **AIC-CCRI-CED in collaboration with NABARD** is assisting / incubating 12 FPOs including one Coffee based FPOs from Karnataka to marketing of their products on TRIFED e-market place through AIC-CCRI-CED.
- **TIES - Coffee Quality Laboratory:** Coffee Board has established a state-of the - art Laboratory Infrastructure for Coffee Quality & Export Certification under Trade Infrastructure for Export Scheme (TIES) exclusively for testing Coffee and Coffee products to meet the international quality standards for exports and to ensure that the Coffees imported meet the country's quality standards. The laboratory is expected to help Indian Coffees to explore premium markets.
- **Digital Extension Services for Coffee Growers - Coffee Krishi Tharanga:** Coffee Board is implementing "Coffee Krishi Tharanga" - a two-way IVR (Interactive Voice Response) service to provide mobile phone-based advice to Coffee farmers through voice calls in local language. Currently, about 67,000 Coffee growers are covered under the project in Traditional Coffee growing areas of Karnataka, Kerala and Tamil Nadu states. The services enable efficient, timely customized advisory on best agricultural

practices, alerts on prices, pest & disease management by leverage existing mobile reach for wider delivery of improved technology.

- **Inclusive development of the Coffee sector**: with financial assistance from the Government of Karnataka (amounting to ₹9.80 crores for a period of four years 2018-2022), Coffee Board has been promoting the production and marketing of Coffee and black pepper that is produced by indigenous tribals in Karnataka. During the year, this programme has reached out to about 2600 tribal growers across three districts, dovetailing with schemes of the State Government. A new tribal Farmer Producer Company (FPC) was established with assistance from NABARD, with in two months of its formation, the FPC has been able to aggregate and sell its members' produce of Coffee to achieve a business turnover of about ₹1.5 Crores. Premium commercial value-added tribal Coffee produces have been launched by the Government of Karnataka under its own brand. A concurrent impact evaluation in Karnataka has shown that, *vis-à-vis* the baseline grower incomes have increased by about 43% in the first two years of the programme implementation.

December, 2021
Bengaluru

Dr. K. G. Jagadeesha, IAS
CEO & Secretary, Coffee Board

CHAPTER - I

EXECUTIVE SUMMARY

Production

- The Final estimates for 2020-2021 were placed at 3,34,000 MT comprising of 99,000 MT of Arabica (30% of total) and 2,35,000 MT of Robusta (70% of total), which is an increase of 12% than the previous year's production of 2,98,000 MT.
- The overall farm productivity of Coffee was 790 Kg/Ha.
- The total area planted with Coffee was around 4.65 lakh hectares, of which the total bearing area was around 4.23 lakh hectares.
- There were around 3,92,398 Coffee holdings in the country of which, around 3,89,501 were small holdings with holding size of less than 10 hectares which accounted for about 99% of the total holdings.

Exports

- As per the export permits issued by the Coffee Board, a total quantity of 3,10,692 MT of Coffee (including 77,390 MT of re-exports) comprising of 46,381 MT of Arabica, 1,63,027 MT of Robusta and 1,01,284 MT of instant, Roasted Coffee beans and Roast & Ground Coffee valued at ₹5,452 crore equivalent to US$ 735 million was exported to 125 countries during the financial year 2020-2021
- The top five export destinations for Indian Coffee were Italy, Germany, Belgium, Russian Federation and Poland.
- The composite unit value of all types of Coffee exported was ₹1,75,477 per MT during the year 2020-2021.
- The total number of exporters registered with Coffee Board stood at 1,423 (including 187 new registrations and 86 Renewal of registration for the year 2020- 2021) as against 1,236 during the previous year.
- A total of 11,446 export permits (Indian origin Coffee - 9,270 and re-exports 2,176) and International Coffee Organization (ICO) Certificate of Origin were issued to 268 registered exporters of Coffee as against 11,546 permits issued during the previous year.

Research

- Exploitation of F_1 hybrid strategy for production improvement in Arabica Coffee has been given the major emphasis. Based on systematic evaluation of 20 F_1 hybrids, six F_1 hybrids with commercial prospects have been identified and efforts are underway for large scale multiplication of the selected F_1 hybrids through public – private partnerships.
- Among the hybrids evolved from crosses between male sterile (ms) plants (S.2660

and S.2678) and distant pollinators (S.2577, S.4595, S.2593 and S.5149), the F_1 progenies, ms x S.5149 and ms x Chandragiri, recorded superior vegetative vigour compared to parents.

- During April 2020, a total of eight hybrids were generated using Chandragiri as recipient parent and S.2803, S.2593, S.2724, S.2665 and S.5168 as the pollen donors. The F_1 hybrid seeds were collected and progenies raised during 2020-21 season.
- In the breeding programme for durable rust resistance to Coffee Leaf Rust (CLR) through gene pyramiding approach, evaluation of the four F_1 progenies (S.5083 to S.5086) developed from reciprocal crosses between Chandragiri (S.4202) x Sln.10, have been continued. The genotypes S.5086 and S.5085 remained free from the incidence and recorded the maximum projected yield of 1,543 kg/ha and 1,268 kg/ha and maximum "A" grade beans of 70% and 72.3% respectively.
- At RCRS, Thandigudi, 11 hybrids generated from the crosses between S.3822 and Sln.10 were evaluated for yield, field tolerance and bean grades. Among the hybrids, S.5319 recorded superior performance with consistent yield (1,518 kg/ha. - mean yield for 3 years), bean quality (73.8% 'A' grade) and the population was found free from the CLR incidence.
- Evaluation of five hybrid progenies (S.5052, S.5053, S.5057, S.5058 and S.5059) revealed that, S.5059 exhibited promising performance compared to all other progenies with respect to yield (1,123 kg/ha), bean quality (64% 'A' grade) and high field tolerance to Coffee leaf rust.
- As part of planting programme of new hybrids,15 hybrids *viz.,* S.4817, S.5283, S.5284, S.5085, S.5086, S.5168, S.5171, S.5119, S.5118, S.4889, S.5146, S.5083, S.5084, S.5087 and S.5082 and clones of Tree Coffee Hybrid (TCH), were planted in two locations, CCRI and CRSS Chettalli.
- Towards breeding for Coffee white stem borer (CWSB) tolerance, established 30,000 tissue culture saplings of the white stem borer tolerant genotype, S.4595 in 27 different locations during 2020-21 planting season for validation of tolerance trait. Further, selfed progenies and clonal saplings of S.4595 - F_1 s were planted at CCRI and CRSS, Chettalli. For planting on-farm trials of S.4595 in different agro climatic zones, seed material of S.5355 (advanced generation of S.4595) was distributed to 77 planters.
- In order to develop trait specific clonal varieties of Robusta, the comprehensive survey for identification of elite mother plants of Robusta was continued during 2020-21 and 106 elite Robusta mother plants were identified in addition to 144 elite plants identified during 2019-20. The yield and quality parameters of these plants have been monitored.

- Under the International collaboration programme with World Coffee Research (WCR), 28 varieties established as International Multi Location Variety Trial (IMLVT) at CCRI have been evaluated. Among the semi-dwarf varieties, the check variety Chandragiri recorded highest yield (1,274 kg/ha) followed by EC-16 (904 kg/ha) and Paraiso (863 kg/ha) during the year. The CLR incidence varied depending on the pedigree of the varieties. Only the variety EC-16 was free from the CLR incidence. The Sarchimor varieties such as Parainema (33%) and Marsellsa (50%), manifested moderate susceptibility. All the Colombian varieties manifested high susceptibility with defoliation under Indian condition.
- Under the collaborative project with Nestle R & D, France, two new Robusta varieties, FRT-133 and FRT-134 and one Arabica variety (GPFA 107) were planted in two locations in addition to four new varieties of Nestle R & D, planted during 2019-20 for field evaluation.
- During 2020-21 season, a total quantity of 20,764 kg of seed Coffee comprising of 17,276 kg of Arabica and 3,488 kg Robusta, was supplied to 22,885 beneficiaries. Out of these, 5717.5 kg was distributed in traditional Coffee growing areas, 9,394.5 kg was distributed in Non - Traditional Areas, and 5,652 kg was distributed in North-Eastern Region.
- Towards popularization of clonal propagation strategy for minimizing the heterogeneity in Robusta, 42,831 nos. of rooted clones of elite plants of Robusta were supplied to 216 beneficiaries for establishment of mother gardens. Besides, 10 hands-on training programmes were conducted for popularization of clonal propagation technology that benefited 144 growers.
- Seven defence related genes isolated from SSH library were screened using 12 Coffee genotypes expressing gradient resistance to Coffee white stem borer (CWSB). Further, 200 Bt strains were screened with *vip* (vegetative insecticidal protein) gene specific primers and which resulted in identification of a new vip1 gene. Four Bt isolates with combination of vip1, vip2 and vip3 genes along with *cry3* genes were selected for bioassay against CWSB.
- Out of seven Arabica Coffee hybrids given to Tissue Culture Division, Mysuru for large scale *in-vitro* multiplication, five hybrids (S.4814, S.4817, S.4932, Sarchimor, S.4595) were successfully regenerated through somatic embryogenesis.
- Genetic fidelity of tissue culture regenerated Arabica Coffee plants and seedlings of different cultivars and species were analyzed using molecular markers. Genomic alterations in coding region of zinc finger protein and chromosomal protein was observed in tissue culture regenerated plants.
- As part of the soil, leaf, agrochemical analysis & advisory service, a total of

6,493 samples (5,889 soils and 604 agro-chemical samples) were analysed and issued recommendations benefiting 2,130 growers.

- Forty on-spot soil testing campaigns were conducted in various Coffee liaison zones in Karnataka, Kerala, Tamil Nadu and Andhra Pradesh and a total of 1,667 soil samples from 1,042 growers were analyzed for soil reaction (pH) and rendered on-spot lime recommendations.
- Long-term field experiment on "Planting design & pruning method" in Arabica cultivar (Chandragiri) was continued at CCRI and Regional Research Stations. Adoption of high density planting systems like hedge row system along with modified pruning methods *viz.,* cyclic and Rock-n-Roll pruning has increased the productivity (30-40%), helped in labour saving (30-50%), reduced the incidence of CWSB and CLR. Further, this method augmented Cost Benefit ratio (1:2).
- Field experiment on "Standardization of fertigation techniques" was continued in Robusta Coffee at CCRI farm. Fertigation with 100% recommended dose of fertilizer (RDF) significantly increased the clean Coffee yield (30-35%) in Robusta Coffee and recorded higher fertilizer use efficiency (3.16 kg per kg of NPK).
- The long-term field experiment on the "Effect of integrated nitrogen management with neem-cake on yield, pest and disease incidence in Arabica Coffee" has indicated that application of oiled and de-oiled neem cake along with RDF has increased the crop yield upto 7 to 15% & 4 to 12%, respectively in Arabica Coffee. Further, the bacterial (582×10^4) and fungal population (155×10^3) was higher in de-oiled neem cake applied blocks.
- The preliminary results on the evaluation of the amino acid based substance ("HYTB") in Robusta Coffee (cv. C×R) revealed that application of amino acid based substance (HYTB @1,000 ml/acre + Nutrient mixture + Planofix) recorded significantly higher yield (12-16%) in Robusta Coffee compared to control.
- Survey conducted on the impact of rainfall on the bean characteristics has revealed that there is a correlation between quantum of rainfall and bean disorders. In both Arabica and Robusta Coffee, the higher rainfall induced bean disorders like empty locules (jollu) and reduction in bean weight.
- Studies on the influence of graft combinations on drought tolerance of Coffee, the graft combinations of S.4595/C×R, Sln.9/S.274 & Sln.5B/C×R has indicated that the root stock of S.4595, Sln.9 & Sln.5B could impart drought tolerance in Robusta Coffee.
- Foliar application of Jasmonic acid @ 1ml/200L of water found to induce drought tolerant traits and increase the yield by 18% in Robusta Coffee.
- In order to identify alternate chemicals for efficient management of important pests and diseases of Coffee, 13 insecticides

and three new fungicides were screened during 2019-20 season, it is further evaluated during current season (2020-21). The efficacy of the five select chemicals was further validated and established in field trials during current season.

- New fungicide molecules Amistar Top (azoxystrobin 18.2% + difenoconazole 11.4% SC) were evaluated under field conditions at two locations i.e., CCRI and CRSS, Chettalli, for management of CLR disease. Result revealed that azoxystrobin 18.2% + difenoconazole 11.4 %SC @ 1.0 ml/L is on par with standard recommended fungicide hexaconazole 5% EC @ 2.0 ml/L in both the locations.
- Towards the Biological control of root disease in Coffee, a total of 102 kg of *Trichoderma harzianum* starter culture prepared using Coffee cherry husk as carrier medium was supplied to Coffee growers.
- Towards development of ideal lure for mass trapping of shot hole borer (SHB) beetles, which is an important pest of Robusta Coffee, extensive experiments were conducted and absolute ethanol was identified as the best attractant for mass trapping of shot hole borer adults in field conditions.
- Laboratory trial on six entomopathogens *viz., Beauveria bassiana, Trichoderma harzianum, Metarhizium anisopliae, Lecanicillium lecanii, Bacillus subtilis*, and *Bacillus cereus*tested for their efficacy against SHB revealed that all the tested entomopathogens caused 100% mortality of SHB adults and its life stages after 5 days of treatments.
- New pesticide molecules were tested for efficacy against CWSB and Coffee berry borer (CBB). Results indicated that the field efficacy of phenthoate 50 EC and fipronil 5 SC against WSB was on-par with the recommended insecticides. The results of another laboratory trial with insecticides such as chlorpyrifos 50 EC + cypermethrin 5 EC, phenthoate 50 EC and fipronil 5 SC recorded significant mortality on CBB and the efficacy was on-par with the recommended insecticide chlorpyrifos 20 EC.
- In order to understand the compatibility of recommended insecticides and fungicides for management of CWSB and CLR respectively, cocktail sprays were undertaken and the spray trials confirmed that the chlorpyrifos 50 EC + cypermethrin 5 EC & chlorpyrifos 20 EC were compatible with fungicide hexaconazole 5 EC. There was no reduction in efficacy of the respective chemicals against the target pest/disease when mixed and sprayed.
- A total of 925 cross vane pheromone traps with lure were supplied to 14 beneficiaries in Karnataka during the 2020-21 season for using as an IPM tool in the management of CWSB.

- A total of 23,400 Broca traps with lure were supplied to 287 beneficiaries for the control of CBB. In addition, 1,200L of lure was supplied to top up traps which were already laid out in the planter's fields. Further, a total of 452 kg of *Beauveria bassiana* was supplied to 21 growers for the biological control of CBB.
- As an eco-friendly measure to manage the mealy bug infestation, 99,900 parasitoids (*Leptomastix dactylopii*) were supplied to 44 growers of Kerala.
- Influence of the stage of harvest on out-turn and quality of Coffee has been evaluated and recommendations issued on the proportion of green fruits in the harvested lot for achieving good out-turn and beverage quality.
- To support the stakeholders on Coffee quality, 584 commercial Coffee samples from 83 stakeholders were evaluated for both raw bean and cup quality parameters and issued quality evaluation reports.
- Analytical laboratory tested 13 Coffee samples from 8 beneficiaries for estimation of Ochratoxin 'A', caffeine and nutritional parameters. A total of 125 moisture meters of 46 beneficiaries were calibrated and tested 44 Coffee samples from 11 beneficiaries for moisture content.
- Three Kaapi Shastra training programmes on Coffee roasting, grinding, packaging and techniques for brewing good quality Coffee were conducted. A total of 52 participants attended the programme.
- Fifteen students who joined the 2019-20 batch of Post Graduation Diploma course in Coffee Quality Management are undergoing third trimester course at Coffee Quality Division, Coffee Board, Bengaluru. Twelve students who joined in the 2020-21 batch have been deputed to CCRI, Balehonnur for pursuing 1st trimester course.
- Implementation of National Accreditation Board for Testing and Calibration Laboratories (NABL) for TIES laboratory was initiated and Scientists of Coffee Quality Division attended induction training conducted by M/s. Analytical Experts and Consultants on ISO/IEC 17025 regarding NABL accreditation for TIES laboratory.
- In order to obtain Geographical Indications registration, 11 applications submitted by the stakeholders have been processed and sent to the GI registry. An awareness programme on authorized user registration on GI tag was conducted at CRSS, Chettalli in coordination with Codagu Planters Association (CPA) on 29thJanuary 2021.
- Physiochemical properties of washed Arabica and washed Robusta revealed that moisture content & water activity in the green Coffee were positively correlated and there was no significant change in bulk density and pH content of washed Arabica and washed Robusta green Coffee samples.
- Analysis of chemical properties of 20 different commercial brands of Coffee products like pure R&G filter Coffee, R&G filter Coffee + chicory blend, pure

instant Coffee, instant Coffee + chicory blend and decaffeinated Coffee available at the local market indicated that caffeine content was highest in pure instant Coffee samples (4.4%) & lowest in decaffeinated Coffee (0.1%), pH was highest in pure R&G filter Coffee (5.82) & lowest in instant Coffee +chicory blend (4.74) and chlorogenic acid content was highest in pure instant Coffee (10.25%) & lowest in R&G filter Coffee + chicory blend (2%).

- Under the scheme "Support for value addition", 28 R & G units set up by the stakeholders were inspected and an amount of ₹77,64,894/- has been sanctioned as subsidy for nine units.
- Towards transfer of technology and for constant flow of technical knowledge to the stakeholders during COVID-19 Pandemic, Research Department conducted 15 webinars that benefited large number of growers as the webinar notices/links were circulated through Grower's associations, social media and also to the individual registered growers.
- Survey was conducted to assess the crop loss due to unprecedented rainfall received in traditional Coffee growing regions during December 2020 and January 2021 and the crop loss reports were prepared and submitted to the nodal Ministry.

Extension and Development

A. Traditional Areas

- Extension personnel carried out 831 field demonstrations, issued 728 advisories through print / electronic / social media to educate the growers on various aspects of Coffee cultivation, conducted 101 village level meetings, 49 training programmes on Coffee cultivations, 10 Exposure visits, 9 vocational training programmes and 2 Seminars.
- During the period under report, the extension units cleared 980 applications pertaining to replantation benefitting 688.74 Ha., 2,724 applications pertaining to 3,007 water augmentation units benefitting 5,047.75 ha.

B. Non-Traditional Areas (Andhra Pradesh & Odisha)

- Extension personnel carried out 606 Method demonstrations, 32 exposure visits, 150 group gatherings and 65 village level meetings for the benefits of tribal Coffee growers and 30 Capacity Building Programmes.
- Support was extended to 4,000 Ha. of Coffee Expansion/Consolidation of Coffee plantations, 11 water augmentation units, construction of 1,207 cement drying yards and purchase of 1,400 baby pulpers units with an objective of improvement of Coffee production and quality.

C. North-Eastern Region

- Extension personnel carried out 1,953 Field demonstrations, 201 group meetings, 80 on-farm trainings and 59 quality awareness campaigns to educate the Coffee growers on various aspects of Coffee cultivation.

- Support was extended to 577.60 Ha. of Coffee expansion/ consolidation, construction of 33 drying yards, 62 water augmentation units and 23 group nurseries to raise 7,26,000 seedlings.

Capacity building programs

- 15 students were graduated from the Post Graduate Diploma course offered by Coffee Quality Division of the Board.
- Three Kaapi Shastra Training Programmes were conducted at Coffee Quality Division and a total of 52 participants have attended the program.

Market Research & Intelligence

- Economic and analytical support was rendered on WTO and trade policy matters pertaining to Coffee. During the year 2020-2021, a total of 175 daily market reports were generated and disseminated.
- The Unit published two issues of comprehensive 'Database on Coffee' for the months of September 2020 and January 2021. The Database on Coffee is very useful for policy makers and stakeholders.
- Crop estimations were carried out using stratified random sampling techniques across different category of holdings and Coffee zones/regions for the season 2020-21.
- The Unit has prepared a proposal for boosting the Coffee exports in the identified clusters under Agriculture Export Policy and submitted proposal to The Karnataka State Agricultural Produce Processing and Export Corporation Limited (KAPPEC) .
- The Unit has provided the requisite inputs with respect to Coffee to the KAPPEC for the implementation of 'Prime Minister Formalization of Micro Food Processing Enterprises (PMFME) scheme in Kodagu district of Karnataka (through One District One Product approach).

Promotion

- The Coffee Board has undertaken seven Virtual Buyer Seller Meeting/ Business Network Meeting/ B2B meeting with active involvement of the Indian Coffee exporters and some of the Indian Embassies.
- During the year, the Coffee Board has participated in eight Food & Beverage / Agri Expos (both Physical & Virtual) in the country for promotion of domestic Coffee consumption.

Administration

- During the year 2020-2021, two Board Meetings were conducted on 27th August 2020 and 11th December 2020.
- During the year a total of 84 officers/ officials were granted financial upgradation under the Modified Assured Career Progression Scheme (MACPS).
- During the year a total of 10 Scientists were granted In-situ promotion under the Modified Flexible Complementing Scheme (MFCS).

- The Staff Strength of the Board as on 31.03.2020 was 587 employees comprising of 62 Group 'A' officers 102 Group 'B' Officers and 423 Group 'C' officials.

Official Language Wing

- The Official Language Wing adhered to the targets fixed in the Annual Programme 2020-21 issued by the Department of Official Language, Ministry of Home Affairs, Government of India.
- Section 3 (3) of Official Languages Act, 1963 and Rule 5 of Official Language Rules, 1976 were complied with. The Target prescribed for originating correspondence & Noting in Hindi has been achieved.
- Translation of 80th Annual report/Audit report 2019-20 of Coffee Board, RTI correspondence, and translations of agenda, notes & minutes for the various committee meetings of the Board has been completed in a stipulated time.
- Official Language Implementation Committee meetings and Hindi Workshops are being conducted in every quarter. Quarterly Progress Report regarding implementation of Official Language in the Board have been forwarded to the Ministry through online and copies of the same has been sent to Town Official Language Implementation Committee (O-2) and Regional Implementation Office, Bengaluru.
- A special incentive scheme which is in vogue for the employees of the Board was continued during the year.
- Hindi Diwas was celebrated on 14.09.2020 by conducting various Hindi competitions to the staff during Hindi Fortnight from 01.09.2020 to 14.09.2020. The Annual In-House Hindi Magazine “ANKUR”(4th edition) was digitally released during the occasion.
- In commemoration of the 150th birth anniversary of Mahatma Gandhiji, "a documentary film based on the life of Mahatma Gandhi" was screened.
- On the occasion of 70th Constitution Day, an essay competition was organized in Hindi, Kannada and English for the children of officers/officials working in all the offices of the Board.
- The Joint Director (E/Admin(i/c)), Coffee Board and one of the officer of Official Language Wing, attended virtually both the **half yearly meetings** conducted by the Town Official Language Implementation Committee (O-2).

  During the year under review, “Rajbhasha Keerti Puraskar” was introduced for the best performance in the progressive use of Official Language in the sections/ units of Head Office and Sub-Offices of Board.

Vigilance and Legal

- Vigilance Division concluded one pending disciplinary case during the year.
- Out of 65 court cases, 13 cases were disposed and 52 court cases are pending.

Engineering Unit

- The Engineering Unit taken up maintenance works of the Board's buildings under the Infrastructure development and a sum of ₹1,61,20,809/- has been incurred during the year.

RTI & Grievances Unit

Right to Information

- Under RTI, 48 applications were disposed out of 51 applications received with three carried forward applications for disposal within the stipulated time during the next year.
- During the year, out of six appeals received under RTI, five appeals were disposed and one appeal carried forward for disposal within the stipulated time during the next year.

Other Initiatives

- **Establishment of Atal Incubation Centre at Coffee Board:** Coffee Board has established an Atal Incubation Centre - Central Coffee Research Institute – Centre for Development (AIC-CCRI-CED) under Atal Innovation Mission (AIM) of NITI Aayog with a grant-in-aid of ₹9.97 Crore over a period of 5 years. The AIC-CCRI-CED is expected to offer business incubation services to startups in Coffee and allied sectors. Presently, AIC-CCRI-CED has on boarded 22 Incubatees & 25 Incubatees targeted by the end of March 2022.
- **AIC-CCRI-CED in collaboration with NABARD** is assisting / incubating 12 FPOs including one Coffee based FPOs from Karnataka to marketing of their products on TRIFED e-market place through AIC-CCRI-CED.
- **TIES - Coffee Quality Laboratory:** Coffee Board has established a state-of the - art Laboratory Infrastructure for Coffee Quality & Export Certification under Trade Infrastructure for Export Scheme (TIES) exclusively for testing Coffee and Coffee products to meet the international quality standards for exports and to ensure that the Coffees imported meet the country's quality standards. The laboratory is expected to help Indian Coffees to explore premium markets.
- **Digital Extension Services for Coffee Growers - Coffee Krishi Tharanga:** Coffee Board is implementing "Coffee Krishi Tharanga" - a two-way IVR (Interactive Voice Response) service to provide mobile phone-based advice to Coffee farmers through voice calls in local language. Currently, about 67,000 Coffee growers are covered under the project in Traditional Coffee growing areas of Karnataka, Kerala and Tamil Nadu states. The services enable efficient, timely customized advisory on best agricultural practices, alerts on prices, pest & disease management by leverage existing mobile reach for wider delivery of improved technology.

- **Inclusive development of the Coffee sector**: with financial assistance from the Government of Karnataka (amounting to ₹9.80 crores for a period of four years 2018-2022), Coffee Board has been promoting the production and marketing of Coffee and black pepper that is produced by indigenous tribals in Karnataka. During the year, this programme has reached out to about 2600 tribal growers across three districts, dovetailing with schemes of the State Government. A new tribal Farmer Producer Company (FPC) was established with assistance from NABARD, with in two months of its formation, the FPC has been able to aggregate and sell its members' produce of Coffee to achieve a business turnover of about ₹1.5 Crores. Premium commercial value-added tribal Coffee produces have been launched by the Government of Karnataka under its own brand. A concurrent impact evaluation in Karnataka has shown that, *vis-à-vis* the baseline grower incomes have increased by about 43% in the first two years of the programme implementation.

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CHAPTER - II

CONSTITUTION AND FUNCTIONS OF THE BOARD

Coffee Board is a statutory organization under the control of Ministry of Commerce, Govt. of India constituted under the Coffee Act 1942, an Act enacted by the Parliament.

The Board comprises 33 members, including Secretary (who is the Chief Executive Officer of the Coffee Board) and 32 members including members of both the houses of Parliament, members representing various interests of Coffee Industry appointed by the Government of India.

The Board is reconstituted for a period of three years from 8th March, 2019 to 7th March 2022 with 20 members.

List of Coffee Board Members for the year 2020-21 (from 08th March 2019 to 07th March 2022)

Sl. No.	Category	Appointed under Coffee Rules, 1955 (Amendment) Coffee Rules 2016	No.	Name
1	Chairman	Rule 3 (1)	1	1. Shri.M.S.Boje Gowda
2	Member of Parliament (LS) Member of Parliament (RS)	Rule 3 (1) Rule3 (1)	2 1	1. Shri V.Srinivas Prasad 2. Shri Prathap Simha 1. Shri A.Vijayakumar

Sl. No.	Category	Appointed under Coffee Rules, 1955 (Amendment) Coffee Rules 2016	No.	Name
3	Representing Governments of Principal Coffee growing States	Rule 3 (2)(a)	4	1. Shri Gagandeep Singh Bedi, I.A.S. Agricultural Production Commissioner & Secretary to the Govt., Govt. of TN 2. Shri Rajendra Kumar Kataria, I.A.S. Secretary to Government, Horticulture and Sericulture Dept., Govt. of Karnataka, 3. Ms. Ishita Roy, I.A.S, Principal Secretary and Agriculture Production Commissioner, Govt. of Kerala, 4. -*Vacant*-
4	Representing Large Coffee growers	Rule 3 (2)(b)	3	1. Shri T.T.John 2. Shri Jampana Shri Ramaraju 3. Shri Shaker Nagarajan
5	Representatives of Small Coffee growers	Rule 3 (2)(b)	7	1. Dr.G.S.Mahabala 2. Shri Machamada Dally Changappa 3. -*Vacant*- 4. -*Vacant*- 5. -*Vacant*- 6. -*Vacant*- 7. -*Vacant*-
6	Representing Coffee Trade Interests	Rule 3(2)(c)	3	1. -*Vacant*- 2. -*Vacant*- 3. -*Vacant*-
7	Representing Curing Establishment Interest	Rule 3(2)(c)	2	1. -*Vacant*- 2. -*Vacant*-

Sl. No.	Category	Appointed under Coffee Rules, 1955 (Amendment) Coffee Rules 2016	No.	Name
8	Representing Labour Interest	Rule 3(2)(c)	3	1. Shri Mundhe Dnyanoba Sitaram 2. Shri Sasikant Soni 3. -Vacant-
9	Ex-Officio Member	Rule 3(2)(c)	1	1. Dr. K.G. Jagadeesha, I.A.S. Secretary and CEO, Coffee Board, Bengaluru
10	Representing Coffee Growing States other than Principal Coffee Growing States	Rule 3 (2)(c)	2	1. Shri Parshant Kumar Goyal, I.A.S. Special Secretary, Dept. of Industries & Commerce, Govt. of Tripura, Agartala. 2. Shri Pabitra Ram Khaund, A.C.S Secretary to Govt. of Assam Industries & Commerce Dept., Government of Assam, Dispur
11	Representing Consumers Interests	Rule 3(2)(c)	2	1. Shri Narendra Vaishampayan 2. Shri Kotla Jayant Reddy
12	Representing Instant Coffee Manufacturers	Rule 3(2)(c)	1	1. -Vacant-
13	Eminent personality in the field of Research/ Marketing/ Management/ Promotion of Coffee	Rule 3 (2)(c)	1	1. Dr.Madhava Naidu, Head, Dept. of Spice and Flavour Science, CSIR-CFTRI, Mysuru.

Functions of the Coffee Board :

The main functions assigned to the Coffee Board are:-

1. Promotion of agricultural and technological research in the interest of Coffee Industry.
2. Assistance to Coffee Estates for their development.
3. Promotion of Coffee sale and consumption in India and abroad.
4. Management of the other operations as per the provisions of the Coffee Act.

Besides, the Board gathers statistical and other relevant data concerning the industry and disseminates the information to various segments of the industry; acts as a recognized spokesperson on behalf of the Coffee industry to the Government, media, trade and general public; provides guidance for the overall growth and development of the Coffee industry.

The Coffee Board represents the Indian Coffee industry in the International forum *viz.,* International Coffee Organization, International Science Organizations, Specialty Coffee Associations and work with them for the benefit of Coffee industry.

Statutory Committees

The Board functions through six statutory committees which are appointed for one year term each and the functions of each committee, as per the Coffee Act are:

Sl. No.	Name of the Committee	Functions
1.	Executive Committee	Deals with functions specifically assigned to it under the Coffee Rules. In addition to that deals with matters not specifically assigned to the Propaganda, Marketing, Research, or any other committees constituted by the Board.
2	Propaganda Committee	Deals with matters relating to promotion of sale and increasing the consumption in India and elsewhere of the Coffee produced in India.
3	Marketing Committee	Deals with Coffee marketing scheme as set forth in the Act and Rules.
4	Research Committee	Deals with promotion of agricultural and technological research in the interest of the Coffee industry in India.
5	Development Committee	Deals with the measures that may be undertaken for the development of Coffee estates.
6.	Quality Committee	Deals with all issues relating to the improvement in the quality of Coffee produced in India.

Details of the Meetings of the Board, Statutory Committees and Non-Statutory Committee held during the period from 01-04-2020 to 31-03-2021.

Board Meetings	207th Board Meeting held on 27th August 2020 208th Board Meeting held on 11th December 2020

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CHAPTER - III

ADMINISTRATION AND ESTABLISHMENT

The Coffee Board is a statutory body constituted under the Coffee Act, 1942 (Act of 1942) having perpetual succession and common seal, with powers to acquire and hold property and to contract and to sue and to be sued.

CEO & Secretary

1. Dr. Srivatsa Krishna, IAS - Up to 30.06.2020
2. Dr. K.G. Jagadeesha, IAS - w.e.f. 01.10.2020

Head of the Departments

The following Heads of Departments held the posts shown against their names during the period.

1. Sri. N.N. Narendra, IOFS, Director of Finance
2. Dr. N. Suryaprakash Rao, Director of Research - w.e.f. 30.09.2020

The responsibilities assigned to different departments and the wings are as under:

1. Secretariat Department

The Secretariat Department is responsible for handling all administrative (staff and office establishment) and vigilance matters, allocation of work among various Divisions / Units of the Board and for monitoring compliance for furnishing information under the Right to Information Act, 2005. The department also deals with convening of meetings of the Board and Statutory Committees apart from monitoring the scheme on Labour Welfare Measures.

The six units attached to the Secretariat Department are:

i) Administration Unit
ii) Official Language Unit
iii) Vigilance Unit
iv) Legal Unit
v) Engineering Unit and
vi) RTI & Grievances Unit

2. Research Department

The Research Department is responsible to carry out research activities on various aspects *viz.,* plant breeding, crop management, plant protection comprising of disease and pest management, post-harvest practices of on-farm processing, pollution abatement etc. The Research Department also renders various advisory services to the planting community besides conducting various training programmes for the benefits of different stakeholders. Analytical Laboratory and Quality Division are the other units of Research Department providing quality evaluation support to the Coffee industry.

3. Extension & Development Department

The Extension Department of the Coffee Board is responsible for establishing linkage between the research fraternity and the Coffee growers for continued transfer of technology with the objective of achieving higher productivity and quality levels of Coffee. The department also extends development support to the Coffee growers on various activities related to Coffee cultivation, production and quality improvement.

4. Market Development & Promotion Department

The Export Unit of the department is responsible for registration of exporters, renewal of registration, issue of export permits and ICO certificate of origin for export of Coffee from India, furnishing of periodical reports to the Ministry and ICO on Coffee exports from India besides extending incentive support for export of high value Coffee to far-off markets and to enhance export of value added Coffee as Indian Brand and export awards in recognition of the best performance in Coffee exports. The external promotion is responsible for participation in International Conferences, Events, deliberations of the International Coffee Organization and Brand Promotion activities. The promotional activity under domestic promotion includes participation in domestic events, media campaign and providing training to prospective entrepreneurs on setting up of Coffee Roasting, Grinding and Packaging Units. This training compliments the scheme for setting up processing unit.

The Market Research & Intelligence unit carried out the activities of market information and intelligence as a part of Board's role as a facilitator to the industry in respect of Coffee exports. It provides inputs on crop conditions, crop estimates and market data / information, monitors the export and provides useful trade related data pertaining to the industry on a daily basis.

5. Accounts & Finance Department

The Accounts and Finance Department of the Board is responsible for allocation / administration of funds of the Board, maintenance of accounts and all matters relating to managing finances of the Board. The Internal Audit Party (IAP) of the Board is a part of the department for internal check of finance and accounts of the head office and sub offices to ensure better efficiency in functioning of the office and maintenance of records.

Secretariat Department

Administration Unit

(a) Recruitment

During the year, the post of Director of Research has been filled up by direct recruitment through open competition.

(b) Promotions

During the year, no promotions were made as permission to effect promotion from the Ministry was awaited.

(c) Modified Assured Career Progression Scheme (MACPS):

During the year a total of 84 officers / officials were granted financial upgradation under the Modified Assured Career Progression Scheme (MACPS).

(d) Modified Flexible Complementing Scheme (MFCS):

A total of 10 Scientists were granted In-situ promotion under the Modified Flexible Complementing Scheme (MFCS).

(e) Transfer and Postings:

A total of 30 officials were transferred during the year 2020-21 which were effected based on general transfer guidelines. The details are as under:

Sl. No.	Cadre / Grade	No. of officers / officials transferred
1.	Group 'A'	8
2.	Group 'B'	4
3.	Group 'C'	18
Total		**30**

Employee's Welfare Measures (01-04-2020 to 31-03-2021)

i) No Conveyance Purchase Advance was granted during the period under report.

ii) No Personal Computer Advance was granted during the period under report.

iii) No House Building advance was granted during the period under report.

iv) The Coffee Board has a tie up with the Life Insurance Corporation of India for operating the scheme called "Group Savings Linked Insurance". At the end of March, 2021, the scheme had 494 members on the roll comprising employees in various cadres. An amount of ₹26,99,926/- was settled to 47 members during the financial year 2020-21 due to retirement, demise etc.

Labour Welfare Measures

a) Educational Stipends: Stipends at the rate of ₹2,250/- were granted to those SC/ST students who passed SSLC/10th class examination during the academic year 2019-20 and who had taken up higher studies after SSLC/10th class to 11th class, Diploma/ Vocational Training etc., during the academic year 2020-21.

b) Incentive Award: An Incentive Award of ₹1,500/- and ₹1,000/- each was granted to one girl SC/ST student and one boy SC/ST student respectively in each division who had scored highest marks in the SSLC/10th class examination during the academic year 2019-20 and continuing further studies.

c) Financial Assistance: Financial Assistance were granted to eligible SC/ST students who pursued graduation and professional courses after 12th standard during 2019-20. The details of Financial Assistance granted are as detailed below:-

Financial Assistance

Details	₹ Per Head	
	SC	ST
Financial Assistance		
a. Graduation (Arts, Science & Commerce)	3,750/-	3,750/-
b. Post-Graduation	7,500/-	7,500/-
Financial Assistance Professional Course		
Medical Science, Agriculture and allied science/ Animal husbandry/ Engineering/ Pharmacy/ Nursing/ other equivalent degree	7,500/-	7,500/-

Fund Utilization during the Financial year 2020-21

Particulars	No. of Beneficiaries	Amount (in ₹)
Educational Stipends	2243	50,46,750
Incentive Awards		
Financial Assistance		
Graduation	3636	1,36,35,000
Post-Graduation	419	31,42,500
Professional Course	357	26,77,500
Grand Total	**6655**	**2,45,01,750**
Scheduled Castes	3244	1,22,37,750
Scheduled Tribes	3411	1,22,64,000
Grand Total	**6655**	**2,45,01,750**

A Sum of ₹2,45,01,750/- was granted to 6655 beneficiaries during the year 2020-21 under Labour Welfare Measures.

Staff Strength of Coffee Board as on 31.03.2021

The details of group wise staff strength, number of Scheduled Caste and Scheduled Tribe employees and particulars of female staff strength of the Board as on 31.03.2021 is summarized below:

Sl. No.	Total		SC / ST				Female	
	Classification	No. of Employees	SC	ST	Percentage of representation		No. of Female Employees	Percentage of Female Representation
					SC	ST		
(1)	Group 'A'	62	5	5	8.06	8.06	9	14.52
(2)	Group 'B'	102	18	9	17.65	8.82	26	25.49
(3)	Group 'C'	423	73	26	17.26	6.15	99	23.40
Total		**587**	**96**	**40**	**16.35**	**6.81**	**134**	**22.83**

Official Language Wing

- The official language wing adhered to the targets fixed in the Annual programme issued by Ministry of Home Affairs, Government of India.
- Total No. of 12,216 documents issued under section 3 (3) of Official Languages Act 1963 were in bilingual form. The prescribed target of 60% for 'C' region in original correspondence and 30% in noting was achieved.
- Translation of 80th Annual report/Audit report 2019-20 of Coffee Board, RTI correspondence, agenda, notes and minutes for the various meetings of the Board and statutory committee meetings was carried out from time to time within the stipulated time.
- Four Hindi workshops were organized for the employees one each in every quarter at the Head Office of the Coffee Board. In these workshops, lectures were organized on topics like Official Language Policies, Rules & Regulation, Quarterly Progress Report, Hindi Typing, Hindi Software Tools etc. by inviting experts and training was imparted to a total of 39 employees during the year and necessary guidelines were given for effective implementation of the official language and its progressive use.
- During the year, Official Language Inspections of various Sections/Units at Head Office were conducted. Official language inspection and workshops could not be organized in the sub-offices of the Coffee Board located in various regions of the country due to the COVID-19 pandemic situation.
- OLIC meetings were conducted in each quarter at Head Office and as per the

norms of Department of Official Language, Ministry of Human Affairs, consolidated quarterly progress report was submitted online from time to time and copies of the same were furnished to TOLIC (O-2) and RIO, Bengaluru.

- A special incentive scheme which is in vogue for Officers/Officials of the Board was continued during the year. As per this scheme, an employee is eligible for a cash award of ₹5,000/- per annum on writing 5,000 words in Hindi and a total of 07 employees participated in the scheme and were awarded for doing their original work in Hindi.
- Hindi Fortnight was conducted at Head Office from 01.09.2020 to 14.09.2020 and various competitions in Hindi were held during the fortnight for the employees of Head office. On 14.09.2019, Hindi Diwas was organised in which Dr. Vinay Kumar Yadav, HOD, Hindi Department, Bishop Cotton Women's Christian College, Bengaluru, was invited as Chief Guest and prizes were distributed to the winners of the various competitions. 4th edition of Annual in-house Magazine in Hindi "ANKUR" online version was digitally released.
- To commemorate the 150th birth anniversary of Mahatma Gandhiji, the Father of the Nation, "a film based on the life of Mahatma Gandhi" was screened at the Head Office on 25.09.2020.
- On the occasion of 70th Constitution Day celebrations, essay competition was organized in Hindi, Kannada and English for the children of employees working in all the offices of the Coffee Board and the winners were awarded with prizes and certificates.
- The Joint Director (Extn / Admin (i/c)), Coffee Board and one of the officers of Official Language Wing virtually attended both the half yearly meetings conducted on 18.11.2020 and 17.03.2021 respectively by the Town Official Language Implementation Committee (O-2).
- "Rajbhasha Keerti Puraskar" was introduced for the best performance in the progressive use of Official Language Hindi in the sections/ units of Head Office and Sub-Offices of Coffee Board. As per the decision of the Evaluation Committee, Promotion section, Export section and Service Records Unit of Head Office and Office of the Deputy Director (Research), RCRS Thandigudi; Office of the Joint Director (Extension), Hassan; Office of the SLO, Sultan Bathery; bagged 1st, 2nd and 3rd Prizes respectively.

Vigilance Unit

The Vigilance Unit is responsible for carrying out the following:-

1. Receiving complaints and taking action thereof.
2. Verification of character and antecedents of persons recruited to the Board's service, preparation and submission of periodical returns to the Ministry of Commerce & Industry.

3. Issuance of Vigilance clearance in respect of employees of Coffee Board for various purposes.
4. Processing of application seeking permission for acquiring moveable and immoveable properties of employees of the Coffee Board and scrutinizing the immovable property returns filed by Group 'A' & 'B' officers.
5. Surprise vigilance check of sub offices / various sections at Head Office.
6. Processing of files relating to disciplinary proceedings.
7. Vigilance Awareness Week was observed from 27th October 2020 to 2nd November 2020.

Details of Vigilance Cases

1.	Pending disciplinary cases as on 01.04.2020	1 case
2.	Disciplinary cases added during the year 01.04.2020 to 31.03.2021	Nil
3.	Disciplinary cases concluded during the year 01.04.2020 to 31.03.2021	1 case
4.	Disciplinary cases pending as on 31.03.2021	Nil

Legal Unit

The Legal cell is responsible for carrying out the following functions:-

- Attending to all the Legal matters pertaining to Service matters, Marketing, Taxation, Intellectual Property Rights (IPR), Plantation Labour, etc.
- Attending litigations pending before various courts *viz.,* Supreme Court, High Courts, Labour Courts, Lower Courts, IPR Tribunal and Sales Tax Appellate Forum etc., of respective States.
- Co-ordination and assisting the Coffee Board's Advocates with relevant records to enable the Advocates in preparing the plaints/counter and for arguments.
- Attending to correspondences connected with Tax (GST and Income Tax), Amendment to Coffee Act and correspondence with the Ministry of Commerce and Industry, Government of India relating to these matters.
- Advising the concerned section connected with filing of periodical returns under GST and pay the tax due wherever payable.
- Furnishing of opinion on files being referred by various sections, *viz.,* Export, Pension, Engineering, Administration, etc.

Status of Court Cases

58 cases were pending at the beginning of the year. During the year, 07 new cases were registered. Out of the total 65 cases, 13 cases were disposed and 52 cases are pending as on 31.03.2021.

Status of Tax Disputes

a) Government of Kerala

The High Court of Kerala vide its order dated 29.08.2008 set aside the orders passed by the STAT confirming the levy of CST for the years 1984/85 to 1990/91, 1994/95 to 1996/97 and remanded the matter to the assessing officer to re-examine the issue in accordance with the law. Similarly, in respect of the Appeals for the

year 1991/92 to 1993/94 and 2000/01 under CST and for the year 1991/92 to 1993/94, 1996-97 and 1997-98 under KGST, the STAT vide its order dated 26.09.2012 remanded the matter to the assessing officer. The Board produced the available relevant records to drop the demand. However, the assessing officer vide order dated 14.3.2014 confirmed the levy of CST and raised demand of ₹34.53 crores and interest of ₹174.09 crores aggregating to ₹208.62 crores for the years 1984/85 to 1990/91, 1994/95 and 1995/1996. The Board filed first and second appeals before the STAT, Palakkad, Kerala. The STAT after hearing the matter in detail passed an order dated 20.5.2016 directing the Assessing Officer to give opportunity to Coffee Board to produce the records and hear in person. However, the State of Kerala filed Revision petitions before the High Court of Kerala which has been dismissed with a direction to complete the assessment within a period of 6 months.

b) Government of Karnataka

The Govt. of Karnataka has issued a revised Notice of Demand of tax of ₹99,640/- under KVAT Act, 2003 and ₹11,43,841/- under CST Act, 1956 for the tax period 2012-13. Now, the Govt. of Karnataka has announced 'Karasamadhana Scheme, 2021'. The Coffee Board intends to opt for this scheme.

Engineering Unit

Coffee Board owns office buildings at various places spread across the country *viz.,* Bengaluru, Mysuru, Chikkamagaluru & Hassan (Karnataka); Chennai & Bodinayakanur (Tamil Nadu); Guwahati & Silchar (Assam); Chinthapalli & Arakuvalley (Andhra Pradesh) and also owns Residential flats in New Delhi, Bengaluru & Hassan (Karnataka); Bodinayakanur (Tamil Nadu) Guwahati & Silchar (Assam) and Chinthapalli & Arkuvalley (Andhra Pradesh).

Besides, there are Research Stations and Residential quarters at Central Coffee Research Institute in Chikkamagaluru district; Coffee Research Sub Stations at Chettalli (Near Madikeri) in Karnataka; Regional Coffee Research Stations at Chundale in Kerala; Thandigudi in Tamil Nadu; R.V.Nagar in Andhra Pradesh and Diphu in Assam. The Technology Evaluation centres maintained by the Extension Department in the States of Karnataka, Kerala, Tamil Nadu, Andhra Pradesh, Odisha, Assam, Arunachal Pradesh, Tripura and Mizoram. India Coffee House in Bengaluru and India Coffee Centre at Bhopal (closed) are also owned and maintained by the Coffee Board.

Details of the Expenditure

The Engineering Unit has taken up the maintenance works of Coffee Board's buildings under Infrastructure Development & a sum of ₹1,61,20,809/- has been incurred towards maintenance works during the financial year.

RTI & Grievances Unit

Right to Information

Under Right to information Act-2005, the Coffee Board received 48 applications from the Citizens of India seeking information/ documents during the year 2020-21 with

three carried forward applications from the previous year. During the year 2020-21, 48 applications were disposed with three carried forward applications for disposal within the stipulated time during the next year. Six appeals received under RTI, of which five appeals were disposed and one appeal carried forward for disposal within the stipulated time during the next year. During the year 2020-21, the Coffee Board received 16 grievances, of which 15 grievances were disposed and one grievance carried forward for disposal within the stipulated time during the next year.

Details of applications under RTI for the year 2020-2021

Sl. No.	Particulars	Status
1.	Opening balance	03
2.	Receipts during the year	48
3.	Total received	51
4.	Disposal during the year	48
5.	Closing balance	03

Details of Appeals under RTI for the year 2020-2021

Sl. No.	Particulars	Status
1.	Opening balance	00
2.	Receipts during the year	06
3.	Total received	06
4.	Disposal during the year	05
5.	Closing balance	01

Details of Grievances for the year 2020-2021

Sl.No.	Particulars	Status
1.	Opening balance	00
2.	Receipts during the year	16
3.	Total received	16
4.	Disposal during the year	15
5.	Closing balance	01

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CHAPTER – III (A)

DETAILS OF STAFF WITH DISABILITY

A total of 16 persons with disabilities are working in the Coffee Board as on 31.03.2021. The cadre wise details are as under:

Sl. No.	Cadre	Group	Personnel Existing	No. of Persons with Disability		Category-wise Persons with Disability		
				No.	Percentage of PwD representation	UR	SC	ST
1.	Dy. Director (Research)	A	5	1	20.00	1	--	--
2.	Junior Liaison Officer	B	13	1	7.69	1	--	--
3.	Research Assistant Gr. I	B	29	3	10.34	3	--	--
4.	Junior Hindi Translator	B	3	1	33.33	1	--	--
5.	Extension Inspector	C	99	2	2.02	2	--	--
6.	Senior Assistant	C	65	1	1.54	1	--	--
7.	Junior Assistant	C	20	6	30.00	6	--	--
8.	Multi-Tasking Staff	C	202	1	0.50	1	--	--
Total			**436**	**16**	**3.67**	**16**	**--**	**--**

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CHAPTER – IV

COFFEE RESEARCH

The Coffee Board research Department has implemented a number of research programs during the year 2020-21 under the programme 'R & D for Sustainable Coffee Production and Transfer of Technology'. The research projects are implemented through a network of Research Stations mainly at Central Coffee Research Institute (CCRI), Chikkamagaluru, Karnataka and its Regional Stations located at Chettalli (Kodagu, Karnataka), Chundale (Wayanad, Kerala), Thandigudi (Pulneys, Tamil Nadu), R. V. Nagar (Visakhapatnam District, Andhra Pradesh), and Diphu (Karbi Anglong District, Assam) and also the Plant Tissue Culture and Biotechnology Centre, Mysuru and Coffee Quality Division, Bengaluru.

Projects are also implemented in collaboration with International Institutes like M/s Nestle R & D France and World Coffee Research, USA and also with National Institutes like University of Agricultural Sciences, Bengaluru, Tamil Nadu Agricultural University, Coimbatore, National Bureau of Plant Genetic Resources (NBPGR), New Delhi and PPV & FRA, New Delhi. CCRI also have collaborative research programmes with private entrepreneurs like Jain Irrigation Systems Ltd., Jalgaon, Maharashtra.

The salient findings under different research projects and other activities implemented during the year 2020 - 2021 are as detailed below:

CROP IMPROVEMENT

Division of Plant Breeding and Genetics

The prime focus of Plant Breeding Division was on four strategies of development of high yielding hybrids through F_1 strategy, breeding for durable rust resistance, breeding for white stem borer tolerance in Arabica and development of trait specific clonal varieties of Robusta. Production and distribution of quality seed of station bred selection to the growers was another important activity undertaken by the Division of Plant Breeding and Genetics.

High yielding hybrids were generated by crossing genetically distant genotypes and by crossing male sterile plants with select pollinators. All the F_1 hybrids generated during 2019 involving two direct crosses of Chandragiri and Rume Sudan parental lines and one reciprocal cross of Chandragiri and Col. Catimor, exhibited superior juvenile vigour compared to its parents. The hybrids, planted at CCRI are under evaluation. During 2020 and 2021, a total of eight direct crosses were made with Chandragiri as the receptor and S.2803, S.2593, S.2724, S.2665 and S.5168 as pollen donors. During March 2021, hybrids were generated crossing Chandragiri with Sln.10 and Parainema with S.881, Rume Sudan ($^1/_1$, $^1/_5$) and also with S.5117.

The crosses of male sterile lines (S.2660, S.2678) and distant pollinators (S.2577,

S.4595, S.2593, S.5149) were repeated during the year. Field evaluation of hybrids developed earlier indicated superior performance of F_1 hybrids S.5363 (S.2678 x S.2577) and S.5357, a progeny developed out of a semi-dwarf pollinator S.5149. The Coffee leaf rust incidence levels ranged from 7-13%, with minimum incidence in S.5363 (S.2678 x S.2577). Additionally cross was generated with distant pollinators like Chandragiri and 60% of resultant F_1 hybrids recorded early emergence of primary branches at nursery stage. The hybrids were established in the field for evaluation.

In the extended field trials of three promising genotypes *viz.,* S.4814 (Colombian Catimor x Sln.5B), S.4817 (Colombian Catimor x S.1934) and S.5146 (Sln.5B x HdeT) along with the control genotypes Chandragiri and Sln.5B, S.4817 recorded high field tolerance in plots of Devon plantation's Badanekhan estate, Hegadde estate and Mahaveer estate of Chikkamagaluru zone with maximum projected yield of 1,624 kg/ha. The semi-dwarf genotypes showed 13-16.5% susceptibility to CLR. The hybrid plants S.4817 $^{2}/_{9}$ and S.4817 $^{3}/_{5}$ recorded 76.12% and 75% "A" grade beans respectively.

The three hybrid progenies S.5327 (S.4889 - $^{23}/_{11}$), S.5328 (S.4889 - $^{24}/_{2}$), and S.5329 (S.4890 - $^{25}/_{1}$), from crosses between Sln. 7.4 x S.3822 were monitored. The fruits from the elite plants, was processed for seed preparation for advancing the generation. Segregation pattern was observed in the seedlings of the F_4 generation of PBG 1 (S.5271 to S.5277) at nursery topee stage. As this progeny is result of multiple crosses, the segregation was recorded in F_3 population. Segregant talls were in a range between 0.2-14.1%.

Breeding for durable rust resistance involved integrating S_H3 gene in semi-dwarf genotypes. Crosses were affected between different semi-dwarf genotypes of Sarchimor, Colombian Catimor, HDT Catuai and S.3822 with Sln.10 as the pollinator and donor for S_H3 gene. Among four hybrid progenies (S.5083 to S.5086) from reciprocal crosses between Chandragiri (S.4202) x Sln.10, S.5085 and S.5086 remained free from leaf rust incidence, with respect to progeny yields. S.5086 recorded the maximum projected yield of 1,543 kg/ha followed by S.5085 (1,268 kg/ha). With respect to bean parameters, S.5085 recorded maximum "A" grade beans (72.3%) followed by S.5086 (70%).

Crosses were generated at RCRS, Thandigudi with S.3822 (Chandragiri) and Sln.10 resulting in 11 hybrid progenies, field established in 2012. Among the progenies, S.5318 recorded highest average yield for four years of 1,583.5 kg/ha followed by S.5319 (1,394.2 kg/ha). The 'A' grade beans in the hybrids was in the range of 48 to 74.8%. S.5319 recorded 74.8% 'A' grade beans followed by S.5313 (73%). The hybrids recorded nil to 16% susceptibility to rust. S.5319 was free from rust incidence.

Among five hybrid progenies of crosses between HDT Catuai and Sln.10 (S.5052, S.5053, S.5057, S.5058 and S.5059), the

hybrid progeny of S.5059 performed superior with 1027 kg/ha mean yield of six years, high field tolerance (with 3% CLR incidence) and quality with 71% of 'A' grade beans.

Among Cavimor crosses (S.5168 & S.5171), average individual plant yields for four years was 919 and 704 kg/ha from S.5168 and S.5171, when compared to 723 kg/ha in mother plant (S.5149) and the hybrids manifested high field tolerance to leaf rust. Four hybrid progenies, S.5117 to S.5120, generated by crossing S.4889 and S.4890 with Sln.10, revealed that, S.5119 was highest yielder (1118.4 kg/ha) with 65.17% 'A' grade bean and 2.70 % rust susceptibility. Evaluation of seedlings of select plants progenies for root traits indicated that hybrid progenies S.5117 ($^{6}/_{1}$) and S.5118 ($^{9}/_{2}$) showed high root volume.

In order to avoid loosing any F_1 hybrids due to pest incidence or any other calamity, all the six promising F_1 hybrids, S.5039, S.5059, S.5168, S.5171, S.5085 and S.5086 were grafted onto Robusta root stock in a compact block. Further, efforts are underway for large scale multiplication of these selected F_1 hybrids through Public - Private Partnership.

Further field planting of new promising genotypes *viz*; S.4817, S.5283. S.5284, S.5085, S.5086, S.5168, S.5171, S.5119, S.5118, S.4595 selfed progenies, tissue culture S.4595 plants, clonal plants of S.4595 F_1 hybrids, clones of Tree Coffee Hybrid (TCH), S.4889, S.5146, S.5083, S.5084, S.5087 and S.5082 was taken up at CCRI and CRSS, Chettalli covering an area of 12.8 ha.

The S.4595 hybrids are being monitored for its WSB tolerance and agronomical characteristics at CCRI, CRSS Chettalli and RCRS, R.V Nagar. Further, in order to validate the WSB tolerance of S.4595, 30,000 tissue cultured F_1 plants raised in collaboration with M/s Jain Irrigation have been planted in 27 locations across the traditional Arabica growing areas like Karnataka (22) and Tamil Nadu (5). In addition, during current season, seed material of S.5355, advanced generation of S.4595, was distributed to 77 planters of different agro climatic zones. Further, F_1 clonal block of S.4595 plants was established at CCRI using 51 rooted clones of S. 4595. The bean grade assessment of S.4595 (28 samples) and S.4596 (7 samples) of the F_1 hybrids showed four plants with more than 40% of 'A' grade beans.

On the Robusta front, with an objective to evolve trait specific clonal varieties of Robusta, the survey, initiated during 2019-20 has been continued for identifying the elite mother plants of Robusta. During the survey,106 elite Robusta mother plants of including S.274 (42), Old Robusta (34) and CxR (30) were identified from the estates in Chikkamagaluru, Kodagu, and Wayanad. Besides, the performance of 120 plants identified during 2019-20 season were monitored to confirm their consistency in yield and quality characteristics. Out of the 28 plants shortlisted last year, based on the yield and quality characteristics, 17 plants showed consistency in yield and quality characteristics. To confirm the pollen compatibility, controlled pollination was carried out among the

shortlisted plants during the current season.

In order to conserve the genetic resources, re-establishment of Arabica germplasm collection of CCRI was initiated during 2019. As part of re-establishment programme, during 2020-21 season, planting of 53 collections, including 25 Portugal hybrids, 5 Abyssinian and 23 world collection were taken up at CCRI. At CRSS, Chettalli, 85 collections, including 31 world collections, 34 Portugal hybrids, 17 Costa Rica and 3 Ethiopian collections were planted.

Under the international collaboration with WCR- IMLVT, 28 varieties were evaluated for yield, quality and field tolerance to Coffee leaf rust. The yield in semi dwarf varieties ranged from 288 kg/ha to 1274 kg/ha. Maximum yield of 1274 kg/ha was recorded in check variety Chandragiri followed by EC-16 (904 kg/ha) and Paraiso (863 kg /ha). Among the tall varieties, maximum yield was recorded by Sln.6 (465 kg/ha) followed by Sln.5B (462 kg/ha) and 'A' grade bean was in the range between 4 to 75%. Maximum 'A' grade bean was recorded in Pacamara, a pure Arabica variety (75%) followed by the IPR-107 (61.38). The control variety, Chandragiri recorded 68% 'A' grade beans. The variety EC-16 was free from the CLR incidence, while susceptibility was moderate among the Sarchimor varieties such as Parainema (33%) and Marsellsa (50%). All the Colombian varieties belong to Catimor types manifested high susceptibility with defoliation under Indian conditions.

In a collaborative research programme, "Introduction and evaluation of new Robusta Coffee varieties of Nestle R & D", two Robusta varieties, *viz.,* FRT-133 and FRT-134 was planted in three locations, *viz.,* CRSS Chettalli, CCRI and RCRS, Chundale during 2020-21 season. This is in addition to the three Nestle Robusta accessions (FRT-65, FRT-97 and FRT-101) established during 2019-20.

Under the industry support programme, during 2020-21 season, a total quantity of 20,764 kg of seed Coffee comprising of 17,276 of Arabica and 3,488 kg Robusta produced from Coffee Board's seed blocks, were distributed to 22,885 beneficiaries across India. Out of these, 5,717.5 kg was distributed in traditional areas, 9,394.5 kg was distributed in Non-Traditional Areas and 5,652 kg was distributed in North-Eastern Region.

Under the pilot programme on scaling up of clonal propagation in Robusta, a total of 42,831 rooted clones of identified mother plants were distributed to 216 beneficiaries from the Research Stations and TECs. Additionally, 10 demonstrations and hands on trainings on clonal propagation have been conducted for 144 growers. Five webinars on vegetative propagation technique were also conducted for the benefit of Coffee growers.

Division of Tissue Culture & Biotechnology, Mysuru

For refinement of mass multiplication technology through tissue culture, leaf cultures of 15 elite F_1 hybrid plants from S.5059, S.5085, S.5086, S.4817 and EC-16, developed by the Division of Plant Breeding and Genetics, CCRI were inoculated in media

containing 2,4-D (1mg/L), KN (4mg/L) along with cysteine HCl and PVP. A recovery of 12 to 54% was recorded.

The effect of Titanium Oxide nanoparticles (TiO_2 NP) and Zinc Oxide nanoparticles (ZnO NP) were tested for recovery and establishment of callus cultures. Results with TiO_2 indicated an initial increase in growth and establishment of callus in 15 mg/L concentration of TiO_2 which later reduced while callus cultures in Zinc Oxide nanoparticles (ZnO NP) showed improvement in callus growth and establishment by 20 to 60%. A reduced recovery and growth of explants were observed in media containing 30 mg/L ZnO NP and above. Investigations conducted in combination media, indicated maximum recovery of 84% in media containing 5 + 5 mg/l mix of ZnO and TiO_2 NPs. An increase in Nano particles content above 15 mg/L was observed to cause reduction in recovery and growth of calli.

A total of 585 regenerated plants of different Coffee cultivars (Sarchimor, S.4932, S.4814, S.4817, CxR, C. racemosa× C×R, C. racemosa, C. stenophylla, C. eugenioides) were kept for hardening and planted in polybags in the nursery. Further, embryogenic cultures and plantlets of S.4814, S.4817, S.4595, S.795, CxR, S.4350, Sln.9 and Cauvery genotypes induced from leaf explants were subcultured onto half strength MS medium with 0.1 mg/l of Kn for embryo germination and plantlet development.

Towards development of transgenic plants, *in vitro* plantlets of transgenic Cauvery plants (S.4350) were regenerated from leaf cultures and the hardened plants were maintained in green house under controlled condition. The *in-vitro* regenerated plants were screened for presence of transgenes using 35s and *Hpt* gene specific primers and results revealed the presence of transgenes in all the plants. Calli cultures of Robusta transgenic plants carrying osmotin gene, CAH_2 gene and 75 leaf explants of decaffeinated Robusta plant using RNAi were generated. The callus cultures of different Robusta transgenic plants (CAH_2, E-13, RT-7 RNAi decaffeinated) were maintained and sub cultured for induction of somatic embryos and the somatic embryos were sub cultured for further multiplication and plantlet development. The inheritance pattern of the transgenes was studied by analysing the T_0, T_1 and T_2 generations using *35s, Hpt,* sgfp epifluorescence and *gus* gene assays. The inheritance of transgenes in T_1 and T_2 progenies of Robusta confirmed a Mendelian ratio of 3:1 and 1:1 segregation patterns respectively. A total of 137 transgenic plants of Arabica and Robusta carrying different transgenes were regenerated through somatic embryogenesis.

Under screening, identification, cloning, expression and bioassay analysis of insecticidal genes (Alpha amylase Inhibitor, cry and vip) from plant and other heterologous sources (Bt) for resistance against Coffee white stem borer, the genomic DNA samples of 15 selected Bt strains were screened using Vip1, Vip2 and Vip3 specific screening and typing primers and a total of four Bt strains, CBC 1357, CBC 1358, CBC 1359 and CBC 1360 carrying different Vip genes were selected for bioassay studies using WSB larvae.

To identify sources of tolerance to WSB by genomic approaches, expression analysis of differentially expressed genes involved in the WSB tolerance mechanism was carried out. Initially, 16 important defense-related genes were selected from the SSH library developed from control and white stem borer infected Robusta plants. The selected genes were studied using genomic DNA samples of 21 different Coffee species. The amplification pattern of all the 16 selected genes were studied in different Coffee genotypes. Further, 26 Coffee cultivars were screened using seven primers specific to isoprene synthase, mannan synthase, peroxisomal membrane protein, aquaporin, cytochrome p450, endoglucanase and PR protein genes. To further sequence characterize these genes and to identify the SNPs and InDels (insertion and deletions) linked with tolerance and to study the expression levels of these genes a panel of 12 Coffee genotypes with varying level of resistance to pest and disease were selected. The seven key genes involved in plant defense such as Isoprene synthase, mannan synthase, cyclophilin and pathogenesis-related proteins were selected for sequence characterization, SNP identification and assessment of expression levels in 12 Coffee genotypes with gradient level of resistance to pest and disease. Amplified sequences of four genes, isoprene synthase, mannan synthase, cytochrome P450 and ABC transporter were sequenced and characterized using genomic tools. The sequences showed 95-99% similarity with the respective genes. Further, the gene sequences were aligned using the ClustalW multiple sequence alignment algorithm of BioEdit software sequence and variations such as SNPs and InDels were identified. The sequence characterization of remaining genes and expression analysis is in progress.

NAC Transcription factor have diverse role in plant during biotic and abiotic stress. Thus, efforts were made to isolate and characterise the NAC TF gene from seven Coffee species including two cultivated Coffee species of *Coffea canephora* (S.274), *Coffea Arabica* (S.795), *Coffea travancorensis*, *Coffea bengalensis*, *Coffea wightiana*, *Coffea jenkinsii* and *Coffea khasiana*. Sequence analysis revealed highest homology of 97.89% to 98.83% with NAC25 like transcript sequence of *Coffea eugenioides*. Further sequences were subject to multiple sequence alignment and sequence variations were studied within the Coffee species.

The nuclear 2C DNA content of five indigenous Coffee species *C. bengalensis, C. jenkinsii, C. khasiana, C. travancorensis and C. wightiana* were estimated using flow cytometry and their ploidy status was ascertained by studying stomatal characteristics. The nuclear DNA content (2C/pg) analysed varied from 1.29 pg in *Coffea wightiana* to 1.48 pg in *Coffea jenkinsii*. Among the stomatal characteristics studied, stomatal chloroplast number recorded significant variation among some species. Based on studies conducted all the five endangered Coffee species analysed in the study were identified as diploids. The study revealed that stomatal guard cell length and

stomatal chloroplast number could be fast, inexpensive, and reliable alternative method for determining the ploidy status of indigenous Coffee species.

Studies were initiated to carry out DNA barcoding of wild diploid Coffee species from India using universal primers such as rbcL, matK and trnL to produce standard barcodes for species identification and to detect the discriminatory power of these standard barcode regions in 11 diploid *Coffea species*. The amplicons of all three genes were sequenced and analysed using ClustalW algorithm of MEGAX software. Dendrogram was constructed using the Maximum likelihood and maximum parsimony method. The species-specific SNPs and InDels were identified in all three gene sequences.

Colletotrichum species causing anthracnose can infect a broad range of host plants including Coffee. Studies conducted on *Colletotrichum* strains infecting Coffee and black pepper with ITS and marker-based identification using 20 SRAP and 15 SCoT markers, revealed that the two *Colletotrichum* strains infecting Coffee and black pepper were genetically distinct.

Studies were carried out for molecular characterisation of 13 *Myrothecium spp.* isolated from Coffee and different plants including weed species from Coffee plantations using 20 SRAP markers during last year. In the current year the SCoT marker assay was carried out and data were analysed. Further, to characterize and identify the 13 species the Internal Transcribed Spacer (ITS) region were amplified and sequenced. Further, the population structure analysis was carried out using delta K values ranging from 1 to 5. The ITS sequences were curated, submitted to genebank.

CROP MANAGEMENT

Division of Agronomy

Studies on new planting designs and pruning systems was continued at CCRI and CRSS Chettalli. The yield performance of Coffee under different planting designs and pruning practices showed significant effect due to the influence of different planting densities and pruning systems. Among the different treatments, T_6 (Hedge row system on multiple stem without topping (6'x3') + Cyclic pruning after each harvest) (5808 plants/ha) registered significantly highest clean Coffee yield of 1,390 kg/ha.

The analysis of labour use efficiency revealed that, modified pruning method like cyclic pruning with square system of planting at close spacing (5x5 ft.) (T_4) require less man days (24 mandays/hectare) to carry out pruning compared to the traditional system (61 mandays/hectare) for pruning. Labour savings to arrange of 26 to 60% is gained by adopting cyclic and rock-n-roll pruning systems compared to normal method of pruning.

The incidence of black rot disease was minimum in modified pruning methods (cyclic and rock-n-roll pruning) compared to T_1 (traditional methods of planting) and T_3 (Square system of planting (6'x6' Quincunx) + training on single stem + multiple stem on middle plant).

Higher net returns of (₹1,41,685/ha) and B:C ratio (2.0) was obtained with high density planting of hedge row system of planting (6'x3') and modified pruning method of cyclic pruning system (T_6) as compared to T_1- Square system at wider spacing with traditional method of pruning (₹33, 575/ha) and B:C ratio (1.21).

Studies on standardization of fertigation techniques in established Robusta Coffee (S.274) were continued. Average yield data of last 4 years indicated significant influence of micro irrigation system and fertigation on clean Coffee yield. Clean Coffee yield recorded significantly higher (2069 cc kg/ha) in T_4 - Fertigation with RDF @ 100%, which was statistically on par with T_5 (Fertigation with 125% RDF -1829cc kg/ha.) and T_3 (Fertigation with RDF @ 75% - 1746cc kg/ha.).

The Water productivity (WP) calculated based on irrigation water applied (WP/IW) was markedly influenced by different micro irrigation system and fertigation treatments. The mean water productivity varied from 1.14 to 2.50 kg m^{-3} in pooled means of last four years. Water productivity (WP/IW) in drip alone and sprinkler irrigation system (2.50 & 2.12 kg m^{-3}) was relatively higher in comparison to WSF fertigation treatments (T_3 to T_6) in pooled means of the experiment (1.14 to 1.49 kg m^{-3}).

The fertilizer use efficiency was worked out by dividing the clean Coffee yield (kg/ha) with total fertilizer applied (kg/ha) indicated that T_3 (Fertigation with 75% RDF) and T_4 (Fertigation with 100% RDF) as WSF recorded comparably higher fertilizer use efficiency of (3.16 & 2.81 kg kg-NPK^{-1}) over the other treatments.

Further, the economics of various fertigation treatments reported higher net returns of T_3 and T_4 (₹80,378 & ₹1,07,114) in pooled mean, respectively. The higher net returns were attributed to higher clean Coffee yield with lower application of fertilizer. Similarly, among the various fertigation treatments, T_3 (Fertigation with RDF @ 75%) registered higher benefit cost ratio (1:1.77 & 1:1.95) by producing 11.62 to 25.42% higher yield over the T_1 (sprinkler irrigation) and T_2 Drip irrigation + 100% soil application).

The field trial initiated to evaluate the effect of amino acid based substance (HYTB) on Robusta Coffee (CxR) indicated that, application of HYTB amino acid based substance along with nutrient mixture (HYTB @1000 ml/acre + Nutrient mixture spray (1kg Urea+1 kg SSP +0.75 kg MOP+1 kg $ZnSo_4$ + 1 kg $MgSo_4$+ 75 ml Planofix) has resulted in significantly higher clean Coffee yield (1158 cc kg/ha) over control (980 kg/ha.).

Study on the impact of application of oiled and de-oiled neem cake on the microbial activity in soils in Arabica Coffee, S.795, initiated during 2017-18 at CCRI indicated that, the total bacterial count and fungal count was highest ($582x10^4$ and $155x10^3$) in treatment supplemented with de-oiled neem cake compared to oiled neem cake ($551x10^4$ and $92x10^3$).

Further, application of neem cake @ 1,200 kg/ha. along with 60 kg of N and 100% P and

K has resulted that higher yield in de-oiled neem applied block (865 kg/ha) compared to oiled neem cake applied block (828 kg/ha). The average clean Coffee yield of four years in Sln.6 indicated that, application of neem cake @ 1,200 kg/ha. along with 60 kg of N and 100% P and K has resulted in numerically higher yield (845 and 740 kg/ha) than control in oiled plot though the variation among treatment was statistically non-significant.

Division of Agricultural Chemistry

The effect of foliar nutrition on Arabica and Robusta Coffee, studied under multi-location field experiment was continued during the year. The yield data of Arabica and Robusta indicated that the yield was significantly influenced by different treatments of foliar nutrition.

The application of foliar nutrition spray of pre and post monsoon (T_{4} - RDF + 19:19:19 + Zn, B, Cu, Mo (Pre-blossom - March) & systemic fungicide (foliar application in pre & post-monsoon periods) recorded maximum yield (CCRI: 865 and Chettalli: 906 kg/ha) and it was found to be on par with planter's practice (T_{10}- RDF + (19 All + Zn, B, Cu, Mo + systemic fungicide) – Pre monsoon & Systemic fungicide alone - post monsoon period) (CCRI:850 and Chettalli: 899 kg/ha) respectively. In Robusta, highest yield of (CCRI : 972 kg/ha; CRSS, Chettali : 1567 kg/ha) was recorded in T_{2} - RDF + 19 All + Zn, B, Cu, Mo – Pre-blossom foliar application -Feb).

Field trials laid out at two locations to study the effect of Mahalaabh, (a proprietary product with Potassium Schoenite, a natural potassic fertiliser) on Arabica and Robusta Coffee has revealed that, application of Mahalaabh @ 75% + MOP @ 25% recorded numerically higher yield in both Arabica (948 kg/ha) and Robusta (1088 kg/ha) at CCRI compared to control.

Under the soil, leaf, agrochemical analysis and advisory service, a total of 6,493 samples (5,889 soils and 604 agro-chemical samples) were analysed and recommendations were issued benefiting 2,130 growers. Based on the soil analytical data, lime and fertilizer recommendations were rendered and the agro-chemicals comprising of liming materials, copper sulphate, fertilizers and organic manures were analysed for their purity.

Forty on-spot mobile soil testing campaign programmes have been organized at different Coffee growing regions to create awareness on the importance of soil test based nutrient management and demonstrated soil sample collection method at village / hobli level. A total of 1,667 soil samples from 1,042 growers were analyzed for soil reaction (pH) and on-spot lime recommendations were given.

Division of Plant Physiology

In order to study the crop behaviour under changing climate, the fruit set and crop behaviour pattern in five zones in Aldur, Chikkamagaluru, Kalasa, Mudigere and Sakleshpur zones in 45 Coffee estates (Arabica - 16 and Robusta - 29) was monitored. Mudigere zone recorded maximum rainfall of

3956.8 mm and Sakleshpur zone recorded lowest rainfall of 1255.8 mm. The percent deficit of rainfall during July and August month rainfall ranged from 19.1% in Kalasa zone to 51.2% in Sakleshpur zone. Survey studies in Chikkamagaluru and Hassan zones indicated fruit set to an extent of 70% to 85% in irrigated Robusta Coffee and 80% to 90% in Arabica Coffee during 2020-21. The unirrigated Robusta estates showed 50% to 55% of fruit set. Torrential rains received during July-August 2020 caused an average premature fruit drop of 2 to 3% in Arabica and 3 to 20% in Robusta Coffee. The maximum fruit drop of 11% to 20% was observed in Kalasa zone due to the incidence of black rot and stalk rot disease. Correlation studies on elevation, rainfall and bean abnormalities indicated more pea berry content and more Jollu percentage in higher elevation under changing climatic conditions in Chikkamagaluru zone. In Robusta Coffee, higher rainfall was found to induce more of Jollu (empty beans) and half locule percentage. While, in Arabica Coffee, higher rainfall doesn't induce more on jollu percentage and doesn't have any impact on out-turn ratio, but a higher rainfall leads to occurrence of higher pea-berry content.

Under Root stock-scion interaction studies for imparting drought tolerance in Robusta Coffee, among the eight scion-stock graft combinations with scions of station-bred Robusta selections (CxR and S.274) grafted on root stocks of Arabica selections (S.4595, Sln.5B, Sln.6, Sln.9), the graft combinations of S.4595/CxR, Sln.9/S.274, Sln.5B/CxR and Sln.6/CxR recorded higher relative water content, epicuticular wax content and gas exchange parameters during before stress, after stress and after alleviation of the stress respectively. The values indicated that the CxR Coffee scion on S.4595 and Sln.5B Arabica root stocks and S.274 Robusta Coffee scion on Sln.5B Arabica root stock were found to be suitable to impart drought tolerance.

Studies using nutrient mixtures (Urea @ 1 kg, SSP @ 1 kg, MOP @ 0.75 kg, $MgSO_4$ & $ZnSO_4$ @ 500g each per 200 litre) and hormonal (Jasmonic acid - 2 ml & growth hormone - Planofix - 50 ml per 200 litre) sprays to mitigate drought in old Robusta Coffee, revealed that foliar application of nutrients (NPK+$MgSO_4$+$ZnSO_4$+Planofix) along with hormones (Jasmonic acid) were effective in mitigating the drought effects in Robusta Coffee during summer season with improved fruit set and yield attributing characters. This combination also helped in controlling pre-mature fruit drop during the monsoon season and contributed in improved the yield by 18% over control (water spray).

Studies were carried out using an inhouse formulation of micronutrients such as Mn, Zn, Bo, Cu, Mo and Fe along with antioxidant growth hormone such as Jasmonic acid to understand its influence on production of cropping nodes, flowering and fruit set parameters in Arabica (cv.Sln.9) and Robusta (cv.S.274) plants indicated improvement in cropping nodes in both Arabica and Robusta plants. In Arabica Coffee, 71.2% and 56.4% improvement were observed in plants treated with Micronutrients + hormone and Single Super Phosphate

respectively while Robusta Coffee showed an increase to an extent of 36.6% and 25.1% with micronutrients + hormone and Single Super Phosphate respectively. In both the cultivars foliar application of micronutrients + Hormone treatment improved the cropping nodes and increased the flower buds per branch at an extent of 53.1% and 45.3% compared to control.

Studies on influence of ripening hormone Ethylene (Ethepon) on Robusta Coffee (CxR and Old Robusta Coffee) revealed, uniform ripening in all the treated plants after 10 days of spraying. However, yellowing and defoliation of leaves was also observed in the sprayed plants as compared to untreated plants. Hence the ripening hormone was found to have a negative impact on retention of the leaves though it resulted in uniform ripening.

CROP PROTECTION

Division of Plant Pathology

Field evaluation of new fungicide molecule Amistar Top (azoxystrobin 18.2 % + difenconazole 11.4 % SC) for the management of CLR disease at two locations i.e., CCRI and CRSS, Chettalli with the susceptible varieties like S.795 and Kents revealed that azoxystrobin 18.2%+ difenconazole 11.4%SC @ 1.0 ml/L is on par with standard recommended fungicide (hexaconazole 5% EC @ 2.0 ml/L).

Field experiments on comparative evaluation of promising fungicides against the Coffee Leaf Rust *viz*., hexaconazole 5% EC, hexaconazole 75 WG, tebuconazole 430 SC, propiconazole 25 EC, pyraclostrobin (133 g/L) + epoxiconazole (50 g/L) w/v SE, Bordeaux mixture (0.5%), carried out at CCRI for two years. Results indicated that the incidence is minimum (1.60%) with pyraclostrobin 133 g/L + epoxyconazole 50 g/L @ 1.0 ml/L treatment. This was on-par with hexaconazole 75 WG and tebuconazole 430 SC. The contact fungicide Bordeaux mixture recorded 52.58% and untreated control recorded (66.28%) incidence. However, all the tested systemic fungicides were found on-par with each other with respect to their efficacy against Coffee leaf rust.

Study conducted for evaluation of fungicides against black rot pathogen, *Koleroga noxia,* indicated that the fungicide Tebuconazole 50% + Trifloxystrobin 25% w/w WG @ 1 g/L was effective and recorded minimum incidence (0.67%) followed by Pyraclostrobin 13.3% + Epoxyconazole 5% w/v SE @ 1 ml/L (2.56%), Tebuconazole 25.6 SC @ 1 ml/L (10.25%). The untreated control recorded the incidence level of 53.35%.

Screening of different Coffee genotypes against brown eye spot disease caused by fungus *Cercospora coffeicola,* under nursery conditions during 2019-20 and 2020-21, revealed that all the genotypes are susceptible to brown eye spot disease. Highest disease incidence was recorded in Robusta genotypes S.274 (12.19%) and CxR (10.53%). Lowest incidence (2.46%) recorded in Arabica cultivar Sln.13.

An experiment was carried out to find an alternative fungicide for management of Coffee root disease. Different concentrations of nine fungicide molecules *viz.,* carbendazim

50 WP, azoxystrobin 23% SC, propiconazole 25% EC, tebuconazole 25.9% EC, difenconazole 25% EC, propiconazole 13.9% + difenconazole 13.9% EC, trifloxystrobin 25% + tebuconazole 50% WG, azoxystrobin 18.2% + difenoconazole 11.4% SC and fluxapyroxad 167 g/L + pyraclostrobin 333 g/L (1000, 2000 and 3000 ppm) were evaluated under *in-vitro* conditions against brown root disease pathogen *Phellinus noxius* (*Fomes noxius*) by poison food technique. 100 per cent mycelial growth inhibition was recorded in treatments propiconazole 25% EC, tebuconazole 25.9% EC, difenconazole 25% EC, propiconazole 13.9% + difenconazole 13.9% EC, trifloxystrobin 25% + tebuconazole 50% WG and fluxapyroxad 167 g/L + pyraclostrobin 333 g/L in all the tested concentrations, while carbendazim 50 WP did not show any control in growth of *Phellinus noxius* mycelium in the tested concentrations.

Antagonistic bacteria (9 no.s) and fungus *Trichoderma* (5 isolates) isolated from Coffee rhizosphere were screened to know the effectiveness against *Phellinus noxius* under *in-vitro* conditions by dual culture technique. Observations after seven days of incubation indicated that 100 per cent mycelia growth inhibition of the pathogen by *Bacillus subtilis* and *Trichoderma* isolate CCRI-5 followed by *Trichoderma* CCRI-2 (97.04%) and *Trichoderma* CCRI-3 (97.78%) and *Bacillus mycoidis* (80%).

In-vitro evaluation of a new combi-fungicide propiconazole 13.9%+difenoconazole 13.9% EC was tested against *Myrothecium roridum* @ 100 ppm (T_1), 250 ppm (T_2), 500 ppm (T_3), 750 ppm (T_4) & 1000 ppm (T_5) along with difenoconazole 25% EC @ 500 ppm (T_6) & 1000 ppm (T_7) and propiconazole 25% EC @ 1000 ppm (T_8) as standard check. Highest (72.50% & 72.00%) mycelial inhibition was recorded in propiconazole 13.9% + difenoconazole 13.9% EC @ 750 & 1000 ppm respectively which was statistically on par with recommended fungicide propiconazole 25% EC @ 1000 ppm (71.67%). However, nil sporulation was observed in propiconazole 13.9% + difenoconazole 13.9% EC @ 500, 750 & 1000 ppm concentrations whereas, treatment propiconazole 25% EC @ 1000 ppm showed low sporulation after 30 days of inoculation at laboratory conditions.

As service support to the stakeholders, a total of 102 kg of *Trichoderma harzianum* starter culture prepared using Coffee cherry husk as carrier medium was supplied to four Coffee growers for the management of root disease in Coffee.

Division of Entomology

Studies on Coffee White Stem Borer (CWSB) was continued on priority. Periodic monitoring on the incidence level of CWSB in nine selected Arabica Coffee estates in Karnataka located at different elevations revealed that the incidence ranged from 5 to 78 plants/acre. The average incidence of CWSB at a higher elevation was low (11 plants/acre) compared to medium (58 plants/acre) and lower elevations (37 plants/acre). Further, less incidence was recorded in the estates located at lower elevation, which followed the timely recommended management practices.

Studies were conducted at CCRI and CRSS to validate the efficacy of currently recommended management interventions against CWSB under the changing climate. All the recommended management measures like maintenance of optimum shade, bark scrubbing, 10% lime application, and spraying of chlorpyrifos 20EC or chlorpyrifos 50EC + cypermethrin 5EC have significantly minimized the CWSB infestation.

Studies were carried out to reduce the input cost towards crop protection. In the confirmatory studies on the compatibility of recommending insecticides and fungicides for CWSB and Coffee Leaf Rust (CLR) disease data revealed, spraying of insecticides like chlorpyrifos 50EC + cypermethrin 5EC and chlorpyrifos 20EC with fungicide hexaconazole 5EC together for CWSB and CLR management neither hinder the effectiveness of the respective chemicals against the target pest/disease nor exhibit any phytotoxic symptoms in plants.

The efficacy of the Non-woven fabric material (NWF) supplied by M/s. Masturlal Private Ltd, Bengaluru was field-tested and was found to be on par with the earlier tested NWF material. Further, the cost of this material is cheaper and the same was popularized among the Coffee growers for effective utilization.

In anticipation of ban on some of the recommended insecticides used for control of CWSB, alternate insecticides were screened to study the efficacy. Results revealed, the efficacy of Phenthoate 50EC@ 2 ml/lit of water and Fipronil 5SC 2 ml/lit of water was on par with currently recommended Chlorpyrifos 20EC and Chlorpyrifos 50EC + Cypermethrin 5EC.

A preliminary survey on incidence of CWSB was carried out in 18 Robusta fields at Pollibetta and Siddapura zones. Symptoms like ridges were noticed on the main stem and thick primaries of S.274, Old Peridenia, and C × R plants. However, exit holes were observed only in S.274 and Old Peridenia cultivars. Though C × R plants had ridges in the main stem and thick primaries but did not show any other symptoms like yellowing of leaves and wilted appearance of the canopy.

A survey on the incidence of Coffee Berry Borer (CBB) was carried out in 35 estates of the Wayanad region during the year 2020-2021. Five estates from seven liaison zones (Chundale, Kalpetta, Sulthan Bathery, Meenangadi, Panamaram, Mananthavady and Pulpally), were surveyed for the incidence of CBB. The highest infestation was noticed in the Bathery zone (10.25%) The least infestation was recorded from the Pulpally zone (4.10%).

Thirteen insecticides, were evaluated for their efficacy against CBB, by using different approaches. Results revealed that, insecticides like Phenthoate 50EC @ 2ml, Fipronil 5SC @ 2ml and Chlorpyrifos 50EC + Cypermethrin 5EC @2ml/ lit of water caused 100% CBB adult mortality and this was on par with currently recommended Chlorpyrifos 20EC.

The incidence level of SHB was monitored in Robusta varieties like old Robusta and CxR

in three locations, like CCRI, Chikkamagaluru, CRSS, Kodagu, and RCRS, Chundale. Kerala. Results revealed that incidence was higher in C×R compared to old Robusta in all the three locations. Further, incidence level in different shade levels like thick and medium (recommended level) revealed that incidence was higher in thick shaded areas.

In order to find out an eco-friendly method to control Shot Hole Borer (SHB), a multi-location field experiment was conducted to study the efficiency of different attractants against SHB. Trapping of SHB adults with different combinations of attracts was observed. Among eight treatments *viz.,* distillery ethanol (40, 50, 60 and 100%), absolute ethanol (50%), broca lure, carbinol and water, 50% absolute ethanol attracted higher number of beetles followed by 40% distillery ethanol.

Evaluation of 12 pesticides against SHB, indicated that insecticides like Chlorpyrifos 50EC + Cypermethrin 5EC, Emamectin benzoate 5SG resulted in 100% mortality of SHB adults at the entrance hole followed by Lambda-cyhalothrin 5EC, Quinalphos 25EC, and Chlorpyrifos 20 EC with 95% mortality. In the case of different stages of insects inside the twigs, the efficacy of insecticides was limited. Among the insecticides, Chlorpyrifos 50EC + Cypermethrin 5EC and Emamectin benzoate 5SG killed 55 and 40% of life stages inside the infested twigs respectively followed by Imidacloprid 17.8 Sl (38.43%) and Emamectin benzoate 5SG (36.20%).

Experiments on SHB control measures in young Robusta plants confirmed that insecticides like Chlorpyrifos 50EC+Cypermethrin 5EC, Carbosulfan 25EC, Thiamethoxam 12.8 + lambda-cyhalothrin 9.5ZC, Propiconazole 25EC and Chlorpyrifos 20EC significantly prevented the new infestation. Field studies conducted to evaluate the efficacy of insecticide and fungicide combination against SHB incidence revealed that the percentage incidence of SHB was less in Chlorpyrifos 50 EC + Cypermethrin 5 EC + Propiconazole 25 EC sprayed plot (6.67%) compared to control (35%).

Studies on efficacy of fungicides was conducted against the SHB associated fungus, Ambrosia, at different concentrations (500, 1000 and 2000 ppm). In the studies conducted under *in vitro* conditions by poison technique, showed all the tested concentrations of Propiconazole 25EC, Tebuconazole 25.9EC, Hexaconazole 75WP and Carbendazim 50WP significantly prohibited the growth of Ambrosia fungus compared to the control plate.

Studies were also conducted to test the efficacy of bio-agents on shot hole borer and its associated fungus *Ambrosia.* Six entomopathogens *viz*., *Beauveria bassiana, Metarrhizium anisopliae, Lecanicillium lecanii, Trichoderma harzianum, Bacillus subtilis*, and *Bacillus cereus* were screened for their efficacy. Results revealed that *B. bassiana, M. anisopliae, T. harzianum*, and *B. subtilis* caused 100% mortality of SHB adults and larval stages 5 days after exposure while, *T. harzianum*, and *B. subtilis* inhibited 100% growth of Ambrosia fungus.

In addition these, studies were also conducted on control of minor pests like mealybug and root grub, which affects Coffee.

Field experiments were conducted at CRSS, Chettalli to study the efficacy of pesticides against root mealybugs. Pesticides like Chlorpyrifos 50 EC + Cypermethrin 5 EC, Dimethoate 30 EC + Hexaconazole 5 EC, Dimethoate 30 EC + Propiconazole 25 EC, Imidacloprid 17.8 SL + Chlorpyrifos 20 EC, Imidacloprid 17.8 SL + Carbendazim 50 WP were drenched around the rootzone of the mealybug infested young Arabica Coffee plant. Results of the experiments revealed that, all the tested pesticides significantly caused mortality on mealybugs.

The preliminary laboratory experiment conducted on the efficacy of 13 different insecticides against root grubs at CCRI revealed 100% mortality of root grubs for Chlorpyrifos 20 EC, Bifenthrin 10 EC, Carbosulfan 25 EC and Lambda Cyhalothrin 5 EC in both tested dosages. Insecticides like Cartap hydrochloride 4 SP and Cyantraniliprole 19.8 w/w + Thiamethoxam 19.8 w/w also produced 100 percent mortality but at higher concentrations. Field experiments revealed a significant reduction in root grub population for Chlorpyrifos 20 EC (93%) followed by Bifenthrin 10 EC (91%), Carbosulfan 25 EC (87%) and Cartap Hydrochloride 4 SP (82%) compared to control.

The service support to the stakeholders, include supply of a total of 925 cross vane pheromone traps with lure and 25 lures alone were supplied to 14 beneficiaries for monitoring as well as management of the CWSB.

To control Coffee Berry Borer, 23,400 broca traps with lure and 1,200 litres of lure alone were supplied to a total of 287 growers a total of 452 kg of *Beauveria bassiana* to 21 growers.

Further, as an eco-friendly measure to manage the mealybug infestation 99,900 parasitoids (*Leptomastix dactylopii)* were supplied to 44 growers of Kerala.

Three soil/root samples were received from two planters were tested for the presence of nematodes and all samples were free from nematode infestation.

In order to create awareness on pest management, six webinars were conducted benefitting 363 beneficiaries, 40 estates were visited, four awareness campaigns were organised, six advisories through print media were issued, four radio talks were given through All India Radio and 10 popular articles were published.

POST- HARVEST TECHNOLOGY

Division of Post-Harvest Technology

A low-cost power operated cherry winnower was developed and evaluated at Central Coffee Research Institute (CCRI) farm during the current season. On-farm trials conducted using Arabica and Robusta cherry Coffees revealed that winnowing was effective at an air velocity of 4 m/sec and feed rate of 20 kg/min. The winnowing capacity of the unit was found to be 1.2 MT/hour (24 bags of cherry per hour each weighing 50 kg dry cherry) and the average power consumption was found to be

0.375 kWh. The cost of winnowing operation is estimated to be ₹87/hr including labour cost for processing about 1.2 MT of dry cherry Coffee. The approximate cost of the winnower is ₹16,000/-. Regarding manpower requirement, the low cost cherry Coffee winnower was found to reduce labour requirement by 50% when compared to manual winnowing.

The cleaning-cum-bagging machine for parchment Coffee, available in the market (M/s. Red Bee Machines, Mysuru) was studied for the performance mainly in the bagging capacity of the machine. Repeated field trials taken up using Arabica parchment revealed that the bagging capacity of the machine was approximately 50 to 60 bags of Arabica parchment per hour (each weighing 50 kg). However, no appreciable difference was observed in manpower used in the use of cleaning–cum-bagging machine for bagging Coffee when compared to manual bagging, but for the easiness of operation. Trials made for cleaning and bagging of cherry Coffee samples using the Red Bee machine, indicated that the machine was not suitable for cherry Coffee as it contained high amount of extraneous materials. The Red Bee machine can however be used for bagging cherry samples after thorough winnowing.

Drying trials using rotary mechanical driers at different temperature levels in comparison with sun drying indicated that Arabica Coffee cherry samples dried in rotary mechanical dryer took 24 hours at 60°C and 40 hours at 50°C and 48 hours at 40°C as against 88 hours for sun drying. The total energy requirement for drying in rotary mechanical dryer ranged from 136 to 518 MJ per tonne of Arabica cherry depending on the temperature level (higher the temperature, greater the energy consumption), while that for sun-drying was found to be 3 MJ/ tonne of cherry. The cost of drying with rotary mechanical dryer ranged from ₹3,191 to ₹7,717 per tonne of Arabica cherry depending on the temperature level (drying cost increases when drying temperature decreases), while, sun drying costed ₹3,240 per tonne of Arabica cherry. Hence, rotary mechanical dryer reduced drying period by about 50% and the cost of drying was almost equal to sun-drying when dried at 40°C.

Drying trials in Robusta Coffee samples indicated that the total drying period for Robusta cherry and parchment Coffee samples subjected to alternate drying temperature was found to be 37 hours and 19 hours respectively, as compared to the drying periods when Coffee samples dried at single temperature level (48 hours for cherry and 24 hours for parchment at 40°C). The alternate drying temperature technique reduced drying time to the tune of 21% to 23%.

On-farm trials were conducted to study the impact of greens (unripe fruits) on out-turn (Ripe cherry to dry cherry & clean Coffee ratio) and quality of Coffee during 2020-2021 season at CCRI farm as well as Coffee Board's Technology Evaluation Centers in Karnataka and Kerala. Results indicated that when only red-ripe fruits were processed, the out-turn from fruit to dry cherry was higher (out-turn

ranged from 43% to 48% with an average of 45.2%), as compared to the out-turn percentage when only greens were processed (outturn ranged from 37.3% to 41.6% with an average of 39.6%). Further, when red-ripe fruits were processed the out-turn percentage from dry cherry to clean Coffee was low (out-turn ranged from 44% to 50% with the average of average of 48%) when compared to the out-turn percentage when only greens were processed (out-urn ranged from 51% to 56% with the average of average of 54%).

The cup quality results of the Robusta Coffee samples from this trial indicated that the quality score of the Coffee sample processed from red-ripe fruits was superior (71.25) and the quality scores reduced as the percentage of greens increased. These results indicated that during dry processing, separation of greens (before exposing the harvested fruits to sun-drying) was essential for improving the cup quality.

Multi-location data on Coffee outturn ratio of Arabica and Robusta Coffee samples processed at various research farms (CCRI, CRSS, Chettalli, RCRS Thandigudi, RCRS, RV Nagar & RCRS, Diphu) and Coffee Board's Technology Evaluation Centres (Karnataka, Kerala & Tamil Nadu), cured at identified curing works were compiled. The results indicated that the average out-turn for Arabica parchment was 81.6%, Robusta parchment 82.9%, Arabica cherry 52% and Robusta cherry 51.8%. These out-turn percentages were in good agreement with the out-turn values recorded in the previous years. The results indicated that there was a need to follow a uniform bench mark out-turn of 50 percent (which corresponds to an outturn of 25 kg of clean Coffee bean/ bag of 50 kg dry cherry) by the traders while deciding the Coffee price as fixing higher bench mark out-turn would tempt the Coffee growers to harvest more of greens which would result in a negative impact on Coffee quality.

Studies were conducted on effect of different fermentation methods (dry fermentation, under-water fermentation & near-anaerobic fermentation) on Coffee quality. Arabica and Robusta Coffee were processed by subjecting to different fermentation methods following standard estate practices at CCRI farm. Data on pH and temperature indicated no much difference in the parameters during the course of fermentation. The Coffee samples subjected to different fermentation techniques were sent to Coffee quality division for sensorial analysis. Fermentation trial using a commercial microbial formulation *viz.,* "Ferbean" (developed by supplied by CFTRI and marketed by Atharva Plantation Services, Mysuru) was also tried following manufacturers recommendations.

The forlit test weight and moisture percentage in dry parchment and dry cherry of Robusta Coffee has been revalidated and the results indicated that the existing test weight standards could be revised to 17.5 kg and 19 kg from the present 16.5 kg & 18 kg for Robusta parchment and Cherry Coffee respectively.

Under studies on pollution abatement and on-farm utilization of effluent, a new treatment

method for treatment of Coffee effluent was evaluated. An effluent treatment plant (ETP) unit *viz.,* Acidification-Neutralization-Sedimentation-Filtration (ANSF) developed at CCRI recently for treating Coffee effluent was evaluated for the fourth consecutive year. Results indicated possibility of reducing the pollution load of Coffee effluent by about 80 to 90% within 8 to 10 days.

Studies were initiated to evaluate the influence of biochar, obtained from cherry husk for its effect on soil pH. The biochar application has slightly increased the soil pH compared to control. Experiments were conducted to produce edible mushroom by using Coffee pulp, cherry husk and parchment husk as substrate. The studies indicated that the combination of Coffee pulp and parchment husk at 50:50 ratio as substrate was better for production of mushroom.

Under service support to the stake holders, a total of 17 Coffee effluent samples received from Coffee growers were analysed for pH, Chemical Oxygen Demand (COD) and Biological Oxygen demand (BOD). The pH, COD & BOD of the effluent ranged from 4.06 to 7.7 and 30 to 1925 mg/L.

A total of four Coffee samples received from the growers were analysed for moisture, grade percentage and out-turn per cent and report were sent to the growers.

COFFEE QUALITY

Division of Coffee Quality

Under studies carried out to analyse different varieties of Arabica and Robusta Coffee for different biochemical parameters, green Coffee samples of six varieties *viz*., Sln. 8, Sln.6, Sln. 9, Sln.5B, Chandragiri and Robusta were tested for protein, fat, caffeine and total ash content. Results indicated Robusta Coffee contained higher amount of caffeine (1.38%) and protein (16.81%) content compared to Arabica varieties. Fat content was higher in Sln.9 (9.39%) and lower in Chandragiri (5.05%). Chandragiri recorded higher ash content of 5.45%.

Physiochemical properties of washed Arabica and washed Robusta green Coffee were evaluated. Moisture content was found 12.02 % and 14.04 % and water activity 0.5893 aω and 0.69389 aω for Arabica and Robusta Coffee respectively. There was no significant change in bulk density, pH. Total ash was 4.42% in Robusta Coffee and 4.08% in Arabica Coffee. The study revealed that moisture content and water activity were positively correlated and there was no significant change in bulk density and pH content of washed Arabica and washed Robusta green Coffee samples.

A comparative study on chemical properties of different commercial brands of Coffee products available in the local market were also carried out. Twenty different commercial brands of Coffee products like Pure R&G filter Coffee, R&G filter Coffee – chicory blend, pure instant Coffee, instant Coffee – chicory blend and decaffeinated Coffee were analysed for various chemical properties like moisture content, caffeine, pH, and chlorogenic acid. The moisture content was found in the range of 1.50 % - 5.55% for different Coffee

products. Caffeine content was found highest in pure instant Coffee samples i.e. 4.4% and decaffeinated Coffee contained 0.1% caffeine content. pH was found to be highest in pure R&G filter Coffee (5.82) and lowest was in instant Coffee – chicory blend (4.74). chlorogenic acid content was found highest in pure instant Coffee samples (10.25 %) and the lowest value was found for R&G filter Coffee – chicory blend (2%).

Steps were initiated for National Accreditation Board for Testing and Calibration Laboratories (NABL) and efforts are underway for implementation of ISO/IEC 17025:2017. The Division was instrumental in Geographical Indications registration for seven Coffees, further to which is facilitating authorised user registration of these Coffee by the stakeholders of the complete Coffee value chain. Awareness program was also conducted for Coffee growers on Authorized user registration on GI tag Coffees.

Under service support to industry, the Division has tested a total number of 584 (Five hundred eighty four only) commercial Coffee samples from 83 beneficiaries for physical and cup quality parameters. A total of 125 moisture meters from 46 beneficiaries including Digital, Sinar and Farmex moisture meters received were calibrated for accurate measurement of moisture level in green Coffee samples and report was sent to the concerned end users.

Moisture content was estimated in 44 Coffee samples received from 11 beneficiaries by oven dry method. Ochratoxin A/caffeine/ nutritional parameters were tested in 13 samples received from 8 beneficiaries and reports have been sent to the stakeholders.

Three Kaapi Shastra training Programmes were conducted during the year and 52 participants were trained.

Under inspection of curing works for grant/ renewal of curing license seven curing works were inspected and licenses have been granted. Under Inspection of units for providing subsidy under the scheme, support for value addition, nine R&G units were inspected and a subsidy amount of ₹77,64,894/- was sanctioned.

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CHAPTER - V

EXTENSION AND DEVELOPMENT

1. Traditional Area

The traditional Coffee growing areas consist of three southern states *viz.,* Karnataka, Kerala and Tamil Nadu. The total planted area under Coffee in traditional areas is 3,67,451 Ha., which accounts for 78.96% of the total area of 4,65,364 Ha. in the country. The number of holdings in Traditional Areas are 1,75,859 which account for around 44.82% of the total number of 3,92,398 holdings in the country.

1.1. Area under Coffee in Traditional Area

The details of planted area, bearing area under Coffee and number of holdings for 2020-21 in the three traditional Coffee growing states are as under:

Table: Planted Area, Bearing Area, No. of holdings in Traditional Area

	Planted Area (Ha.)			Bearing Area (Ha.)			No. of Holdings		
	Arab.	Rob.	Total	Arab.	Rob.	Total	<10 ha.	>10 ha.	Total
Karnataka	107839	138080	**245919**	99004	128098	**227102**	77742	2246	**79988**
Kerala	4231	81649	**85880**	3955	81021	**84976**	77584	277	**77861**
Tamil Nadu	29338	6314	**35652**	27900	6004	**33904**	17665	345	**18010**
Total for Traditional Areas	**141408**	**226043**	**367451**	**130859**	**215123**	**345982**	**172991**	**2868**	**175859**

1.2. Weather Conditions and Crop Production for 2020-21

During the year 2020, the receipt of blossom and backing showers was satisfactory in all the Coffee growing tracts of the Traditional Areas. The southwest monsoon set in during the first and second week of June 2020 and brought in copious showers which helped in rejuvenation of tanks and streams, recharging of Bore wells. During the first fortnight of August 2020, the Coffee growing regions of Karnataka and Kerala has received heavy incessant rains with gusty wind leading to floods / landslides and uprooting of shade trees & Coffee in plantations and substantial crop losses. In this period, there was an excess rainfall of 127% in all traditional Coffee growing areas, leading to significant losses to standing Coffee crop. An area of about 58,655.5 ha. was affected with crop loss ranging from 33 to 50% in Karnataka.

Variation in the weather pattern brought unprecedented rains from moderate to heavy showers during the month of September 2020 resulting in Black rot and Stalk rot incidences in Coffee plantations, especially in high altitude areas.

The monsoon helped in maintaining the soil moisture and vegetative growth of the Coffee plants. The rainfall during the monsoon period of 2020 was less in comparison to the corresponding period of 2019 in traditional areas.

The North East monsoon was set in during first week of November 2020 brought moderate to heavy showers. In other parts of Coffee region the effect of North East monsoon helped in boosting the health of bushes, growth of productive wood and in retention of soil moisture. Further, during the first fortnight of January 2021, majority of the Coffee growing regions of Karnataka, Kerala and Tamil Nadu received rainfall ranging from 25 mm to 200 mm. This rainfall is very unusual and untimely. This has again caused considerable loss to the standing crop and also to the quality.

Overall the seasonal conditions prevailed during 2020-21 was favourable for crop. However, the unprecedented rains received during the month of August / September 2020 & January 2021 has let to substantial crop losses, flooding and landslides in the traditional Coffee growing states.

The COVID-19 pandemic had a profound impact on plantation sector including production. About 30 to 40% of labour shortage was experienced especially during the harvesting season resulting in increased cost for harvesting. The problem was more in big plantations resulting in delay in harvesting. This has resulted in over ripening of berries which in-turn affected the quality.

The final crop estimates for 2020-21 season in respect of traditional Coffee growing areas was placed at 3,22,500 tonnes comprising 87,620 tonnes of Arabica and 2,34,880 tonnes of Robusta. The state-wise details are as under:

Table: Final Estimates of Coffee Production in Traditional Area (2020-21)

State	Production Estimates (Tonnes)		
	Arabica	Robusta	Total
Karnataka	73,000	1,62,500	2,35,500
Kerala	1,820	67,280	69,100
Tamil Nadu	12,800	5,100	17,900
Total for Traditional Area	**87,620**	**2,34,880**	**3,22,500**

1.3. Natural Calamity in Coffee Areas of Karnataka

In 2020 also majority of the Coffee growing regions of Karnataka have witnessed incessant rain during the first fortnight of August 2020 coupled with gusty surface winds resulting in significant damage to the standing crop in the form of pre-mature fruit drop and fungal diseases. The Coffee Board's Extension teams carried out surveys in the affected

areas of Karnataka to estimate the extent of damage to the Coffee plantations.

As per the assessment in Karnataka state, out of the total bearing area of 2,27,102 ha, an area of about 58,655.5 ha has been reported to be affected by crop loss of more than 33%.

The growers in the areas declared as calamity affected will be eligible for relief as per NDRF/ SDRF norms apart from rescheduling of crop / term loans as per the RBI Master Guidelines issued vide Notification No. RBI/FIDD/2018-19/64 Master Direction FIDD.CO.FSD.BC No.09/ 05.10.001/2018-19 October 17, 2018 to all Scheduled Commercial Banks (including Small Finance Banks and excluding RRBs) and No. RBI/FIDD/2018-19/64 Master Direction FIDD.CO.FSD.BC No.10/ 05.10.001/2018-19 October 17, 2018 to all Regional Rural Banks.

The Government of Karnataka vide Notification No. RD 644 TNR 2020 dated 01.02.2021 declared 25 districts and 180 taluks of Karnataka (including major Coffee growing districts, Kodagu, Chikkamagaluru and Hassan) as flood affected regions as per the guidelines of SDRF / NDRF.

1.4. Pests and Diseases

The incidence of White Stem Borer, which is a major pest on Arabica, was generally medium to high in low rainfall zones and endemic areas. The incidence of Coffee Berry Borer was also low in most of the Coffee growing regions. The incidence of other pests like Shot Hole Borer on Robusta and sucking pests was at low level in general. Further, the population of Giant African Snail (GAS) was found to be decreased in Bellaralli and neighbouring villages of Shanivarasanthe zone of Kodagu district.

Among the diseases, the incidence of Coffee leaf rust, a major disease on Arabica was at low to medium level. The incidence of black rot, stalk rot, die back and root diseases were also low.

1.5. Extension Activities

The Extension Offices are under the administrative control of the Director of Research, Coffee Board. The Director of Research, Coffee Board supervises the implementation of Development Support Schemes. The Joint Director (Extension) at Hassan supervises the extension / development activities of the four Deputy Directors of Extension, seven Senior Liaison Officers and all the Junior Liaison Officers in Karnataka. The Joint Director (Extension), Kalpetta supervises the extension activities of the two Deputy Directors of Extension, eight Senior Liaison Officers and all the Junior Liaison Officers in Kerala and Tamil Nadu.

The Extension Personnel of the Board continued to build close rapport with the Coffee growers for transfer of technology and to improve the knowledge and skills on scientific method of Coffee cultivation. Various

individual and group extension approaches and tools were employed for transfer of technology to the growers in general and small growers in particular, besides providing development support for improving the production, productivity and quality of Coffee.

The focused approaches employed and the activities carried out during the period included selection of model estate for conducting method demonstrations / on-farm demonstrations to improve the skills of carrying out operations effectively, advisory through print/ electronic/ social media, organizing village level / group meetings and seminars and other training programmes in order to improve the knowledge and skill levels of Coffee growers and workers.

The Extension Personnel also carried out activities *viz.,* periodical assessment of crops, monitoring & management of pest and disease incidence, procurement and distribution of seed Coffee.

Table: Details of various extension activities carried out during the year 2020-21

Sl. No.	Activities	Achievement (Nos.)
1	Estate Visit	15974
2	Selection of Model Estates	140
3	Field Demonstrations	831
4	Village level meetings	101
5	Seminars	2
6	Capacity Building Programmes on Coffee cultivation at TECs	49
7	Advisory	
	a) Print Media	64
	b) Electronic Media (Radio talks / TV programme)	9
	c) Social media	655
8	Exposure visits	10
9	Vocational training programme for women workers/ growers	9

1.6. Technology Evaluation Centres (TECs)

Ten Technology Evaluation Centers (TECs) of the Board located in different agro climatic zones of traditional areas continued to function for carrying out timely cultural operations as per the annual action plan drawn for each TEC for improving production and productivity. These TECs continued to serve as centers for evaluating the performance of various plant materials by adopting region / location specific agronomic package of practices as training centres and as seed production centres.

Table: Details of Technology Evaluation Centres (2020-21)

Name of the TEC		Year of commencement	Planted Area in Ha.			Bearing Area in Ha.			Production (kgs.)		Productivity (kg/ha)	
			Ar.	Rob.	Total	Ar.	Rob.	Total	Ar.	Rob.	Ar.	Rob.
Karnataka												
1	Arasinaguppe, Chikkamagaluru	1980	6.50	0.00	**6.50**	4.80	0.00	**4.80**	2,421	0	504	0
2	Hesgal, Mudigere	1977	8.83	0.98	**9.81**	8.83	0.42	**9.25**	3,404	226	385	538
3	Matasagara, Sakaleshpur	1959	5.23	1.25	**6.48**	5.23	1.25	**6.48**	1,250	1,280	239	1024
4	Gonikoppal	1958	0.00	10.56	**10.56**	0.00	10.56	**10.56**	0	6,780	0	642
Kerala												
1	Kalpetta	1958	0.27	6.93	**7.20**	0.27	6.50	**6.77**	92	6,657	340	1,024
2	Mananthavady	1979	0.50	8.30	**8.80**	0.50	8.18	**8.68**	112	6,550	224	801
3	Vazhavara	1998	0.70	1.84	**2.54**	0.70	1.84	**2.54**	497	1,785	710	970
Tamil Nadu												
1	Gudalur	1985	2.13	3.44	**5.57**	1.36	2.00	**3.36**	565	1,535	415	768
2	Bodinayakanur	1983	3.50	0.00	**3.50**	3.50	0.00	**3.50**	1,760	0	503	0
3	Yercaud	1986	10.00	0.00	**10.00**	10.00	0.00	**10.00**	5,960	0	596	0

1.7. Development Support for Coffee in Traditional Areas

The Extension Personnel of the Board carried out the works of registration, investigation, processing of subsidy applications / claims and disbursement of subsidy for effective implementation of the development support scheme. Subsidy was extended to the Coffee growers in traditional areas for carrying out re-plantation and water augmentation activities for improving production, productivity and quality of Coffee.

Table: Development Support Achievements during 2020-21 (MTF period)

Sl. No.	Component / Activity	No. of Beneficiaries/ No. of Units	Area benefited in Ha.
1	Replantation	980	688.744
2	Water Augmentation	2,724 / 3,007	5,047.75
3	Eco Certification	9	23.77
4	Quality Upgradation*	172 / 199	117.34

(* - Only to SC growers)

2. Non-Traditional Area [NTA] - (Andhra Pradesh & Odisha)

Coffee Board conducted a Techno-Feasibility Survey in the early 1950's to identify areas suitable for Coffee cultivation in the states of Andhra Pradesh (AP) and Odisha. Based on the recommendation in the survey report, the Forest Department of AP first started commercial Coffee cultivation in the Agency areas of Visakhapatnam in 1961. These plantations were later handed over to Andhra Pradesh Forest Development Corporation Ltd., (APFDC) for maintenance. In 1976, the Integrated Tribal Development Agency (ITDA) introduced Coffee as a development initiative for tribal groups to stop the practice of 'Podu' or shifting cultivation. Realizing the potential of Coffee farming in non-traditional area, Coffee Board executed its support for Coffee development in Andhra Pradesh and Odisha from IX five year plan onwards.

2.1. Distribution of Area in NTA

The details of area under Coffee and the number of holdings in Andhra Pradesh and Odisha are as under:

Table: Planted Area, Bearing Area and Number of Holdings in Non-Traditional Area

Liaison zone	Planted Area (Ha.)			Bearing Area (Ha.)			No. of Holdings		
Andhra Pradesh	**Ar.**	**Rob.**	**Total**	**Ar.**	**Rob.**	**Total**	**<10**	**>10**	**Total**
Minumuluru	38283.23	0.52	**38283.75**	31017.23	0.52	**31017.75**	100250	1	**100251**
Chintapalli(E)	14221.58	181.40	**14402.98**	12001.58	181.40	**12182.98**	29974	2	**29976**
Chintapalli(W)	20699.31	82.31	**20781.62**	16622.21	82.31	**16704.52**	35767	1	**35768**
Arakuvalley	15487.60	0.00	**15487.60**	11508.00	0.00	**11508.00**	38215	1	**38216**
Total AP	88691.72	264.23	**88955.95**	71149.02	264.23	**71413.25**	204206	5	**204211**
Odisha	4339.13	0.00	**4339.13**	4135.13	0.00	**4135.13**	4311	19	**4330**
Grand Total	**93030.85**	**264.23**	**93295.08**	**75284.15**	**264.23**	**75548.38**	**208517**	**24**	**208541**

2.2. Weather Conditions and Crop Production

In Andhra Pradesh, the weather was satisfactory and congenial for development of Coffee during 2020-21. Blossom showers received during March 2020 followed by backing showers during April 2020, helped in blossom and fruit set. The South West monsoon was set during June 2020 and was active. These showers are helpful for development of vegetative growth as well as maintaining the soil moisture status. The distribution of rainfall was satisfactory throughout the season facilitating the maintenance of satisfactory soil moisture level.

In Odisha, during the second week of February 2020 blossom showers received and subsequent showers received during April 2020 in most of the Coffee growing areas of Odisha. The South West monsoon commenced during 1st fortnight of June 2020 and continued up to 2nd fortnight of October 2020. During the month of February 2021, the entire Coffee zone of Odisha experienced warm and bright weather.

Considering the overall situation, the final crop estimates for 2020-21 season was 11,340 tonnes comprising 11,310 tonnes of Arabica and 30 tonnes of Robusta.

2.3. Pests and Diseases

In Andhra Pradesh and Odisha, no major outbreak of pests and diseases was reported during the year 2020-21 Regular advisories were rendered through all possible means to sensitize the Coffee growers on the management practices for effective control of pests and diseases.

2.4. Extension Activities

The extension activities undertaken by the Extension Personnel of Andhra Pradesh and Odisha focused on transfer of technology through contact and follow-up visits to Coffee holdings, conducting field demonstrations, group discussions, issue of advisory letters etc., for improvement in production, productivity and quality of Coffee in the tribal sector.

Table: Details of Various Extension Activities carried out in Non-Traditional Areas during the year 2020-21

Sl. No.	Activities	Achievement (Nos.)
1	Estate visits (Nos.)	2169
2	Method demonstration (Nos.)	606
3	Group gatherings addressed (Nos.)	150
4	Village level workshops	65
5	Capacity Building Programmes	30
6	Exposure visits	32

2.5. Technology Evaluation Centres (TECs)

There are two Technology Evaluation Centres (TECs) functioning in NTA, one at Minumuluru (Andhra Pradesh) and another at Koraput (Odisha). These farms continued to serve as Demonstration cum Training Centres apart from seed production centres for quality seed Coffee.

Name of the TEC	Year of commen-cement	Planted Area in Ha.			Bearing Area in Ha.			Production (kgs.)		Productivity (kg/ha)	
		Ar.	Rob.	Total	Ar.	Rob.	Total	Ar.	Rob.	Ar.	Rob
Andhra Pradesh and Odisha											
TEC Minumulur	1971	8.15	0.52	**8.67**	7.75	0.52	**8.27**	2,733	500	353	961
TEC Koraput	1978	9.992	0.55	**10.542**	9.64	0.55	**10.19**	9,070	550	940	1,000

2.6. Mini Coffee Curing Works

The Mini Coffee Curing Works established at Chintapalli in Andhra Pradesh during 2004-05 continued to process raw Coffee of the tribal growers of Andhra Pradesh. During 2020-21, a quantity of 11,297 kgs of Coffee was cured.

2.7. Coffee Development programme in Non-Traditional Area:

The physical achievement under different subsidy schemes implemented in NTA for the year **2020-21** is furnished below:

Table: Achievement under Coffee Development programme during 2020-21

Activities	Area / Units
Coffee Expansion / Consolidation (Area in Ha.)	4,000
Quality up-gradation	
a) Drying yard (No. of units)	1,207
b) Baby pulpers (No. of units)	1,400
c) Water Augmentation (No. of units)	11

3. North Eastern Region (NER)

Coffee was introduced in Cachar district of Assam in the year 1953. The Coffee expansion programme was initially taken up by the Corporations / Departments of the various states of North Eastern Region. As cultivation of Coffee was encouraging, Coffee Board undertook a comprehensive survey during 1982-1990 and identified suitable areas for Coffee cultivation in different states of NER. Thereafter, the Board involved directly in the implementation of Coffee development programmes from IX Plan period (1997-2002) onwards.

3.1. Distribution of Area

The details of area under Coffee and number of holdings in North Eastern States are as under:

Table: Planted Area, Bearing Area and No. of holdings in North Eastern Region

Sl. No.	Liaison Zone/State	Planted Area (Ha)			Bearing Area (Ha)			No. of Holdings		
		Arabica	Robusta	Total	Arabica	Robusta	Total	<10	>10	Total
1	Arunachal Pradesh	2.50	476.70	**479.20**	0.00	161.90	**161.90**	473	2	**475**
2	Assam	274.98	140.47	**415.45**	127.08	84.45	**211.53**	991	1	**992**
3	Manipur	128.30	38.60	**166.90**	14.05	0.00	**14.05**	229	0	**229**
4	Meghalaya	266.70	774.02	**1040.72**	164.59	203.37	**367.96**	2093	0	**2093**
5	Mizoram	1244.65	75.35	**1320.00**	374.22	13.90	**388.12**	2108	1	**2109**
6	Nagaland	830.30	102.00	**932.30**	135.95	1.00	**136.95**	1542	1	**1543**
7	Tripura	134.25	129.45	**263.70**	101.10	12.60	**113.70**	557	0	**557**
	Grand Total of NER	**2881.68**	**1736.59**	**4618.27**	**916.99**	**477.22**	**1394.21**	**7993**	**5**	**7998**

3.2. Weather conditions and Crop Production

The general climate in North Eastern States is mostly tropical and subtropical with distinct features experiencing long days, high rainfall, change in diurnal temperature etc. However, the rainfall in NER was not a limiting factor for Coffee cultivation.

The final crop estimates for 2020-21 season was placed at 160 tonnes comprising 70 tonnes of Arabica and 90 tonnes of Robusta.

3.3. Pests and Diseases

In general, no major incidence of pest and disease was observed in the Coffee estates of North East Region except low incidence of white stem borer and Coffee Leaf rust in some pockets.

3.4. Extension Activities

The extension activities undertaken by the Extension Personnel, focused on transfer of technology through contact and follow-up visits to Coffee holdings, conducting field demonstrations, group discussions, Quality awareness campaigns etc., for improvement in production, productivity and quality of Coffee in the tribal sector.

Sl. No.	Activities	Achievement (Nos.)
1	Estate visits	2631
2	Field demonstration	1953
3	Group meetings / seminars	201
4	Quality awareness campaigns	59 (941 beneficiaries)
5	On-farm training	80 (1,386 beneficiaries)
6	**Study tours**	
	Internal	2 (21 beneficiaries)

3.5. Technology Evaluation Centres (TECs)

Four Technology Evaluation Centers continued to function in North Eastern Region at Deomali (Arunachal Pradesh), Haflong (N.C. Hills, Assam), Bualpui (Mizoram), Tulakona (Agartala, Tripura). The TEC, Bualpui in Mizoram continued to serve as demonstration cum training centre apart from seed production centre.

Name of the TEC	Year of commencement	Planted Area in Ha.			Bearing Area in Ha.			Production (kgs.)		Productivity (kg/ha)	
		Ar.	Rob.	Total	Ar.	Rob.	Total	Ar.	Rob.	Ar.	Rob.
North Eastern Region											
Deomali	1983	0.00	13.00	**13.00**	0.00	13.00	**13.00**	0.00	9,000	0	692
Haflong	1980	2.98	6.62	**9.60**	2.08	4.40	**6.48**	0.50	2.00	240	455
Bualpui	1988	10.50	0.00	**10.50**	8.40	0.00	**8.40**	2,500	0.00	298	0
Tulakona	1986	0.00	8.40	**8.40**	0.00	8.00	**8.00**	0.00	1,000	0	125

3.6. Support under Coffee Development Programme in North Eastern Region

During the year, the Board extended financial support for various activities *viz.,* Expansion, Consolidation and Quality Up-gradation under Coffee Development Programme in North Eastern Region with an overall objective of improving the production and quality of Coffee. The physical achievement with regard to support extended for different activities in NER during the year are furnished below:

Activities	Area / Units
Coffee Expansion/ (in Ha.)	533.45
Consolidation of Coffee (in Ha.)	44.15
Group Nursery (Nos.)	23 (7,26,000 seedlings)
Drying Yard (Units)	33
Water Augmentation (Units)	62

In addition to financial support extended for activities as indicated above, the Board also supported for raising and supply of Coffee seedlings and shade tree saplings through group nurseries to facilitate the Coffee expansion and consolidation activities.

The Board continued to extend necessary financial support to meet the cost of collection of raw Coffee from the tribal growers, processing, transportation and disposal of Coffee produced in North Eastern Region.

3.7. Mini Coffee Curing Works

The Mini Coffee Curing Works established by the Board at Bualpui continued to process the raw Coffee pooled by the growers of Mizoram and Tripura states.

4. Capacity Building for Stakeholders

During the period under report, various training programmes were conducted as a part of the capacity building for stakeholders of Coffee industry as detailed below:

- About 79 Nos. Training and skill building programmes on various aspects of Coffee cultivation for the benefit of Coffee growers, estate workers and supervisory staff were conducted at the Technology Evaluation Centres of Coffee Board.
- Nine Vocational training programmes for women were conducted for the benefit of 188 women growers / workers in association with Krishi Vigyan Kendras of Agricultural Universities / ICAR.

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CHAPTER - VI

MARKET DEVELOPMENT AND SUPPORT FOR PROCESSING

In order to enhance domestic Coffee consumption in a robust domestic Coffee market and with a view to offer better returns to the growers, especially, the small growers during periods of low international prices and to provide scope for value addition, the following two components were approved by the Government of India.

A. Market Development

B. Support for Value addition

A) Market Development

The Component has three sub-components *viz.,* (i) Market Research & Intelligence; (ii) Domestic Coffee promotion and (iii) Support to small grower collectives / SHGs / Cooperatives for Coffee marketing.

(i) Market Research and Intelligence

The component focuses on providing analysis of market trends to growers through web and dissemination of same through the Extension network of the Board to enable the growers to achieve better price discovery in the market. The work carried out by the Market Intelligence Unit mainly covers the supply estimation by carrying annual crop estimation, analysis of market, maintenance of Database on Coffee, Domestic indicator price reports, Domestic consumption and attitude surveys and also carrying out periodical research reports.

(ii) Domestic Coffee Promotion

Coffee Board regularly participates in reputed domestic exhibitions, which are conducted in various parts of the country by displaying different grades of Coffees, Coffee samples of all growing regions, specialty Coffees, literature on Indian Coffee, making the public aware about the advantages of Coffee drinking through publicity materials and also serve pure Coffee to the visitors. Due to COVID-19 pandemic during 2020-21, the Coffee Board participated in three physical events and five virtual events, which are as under;

Details of Domestic Events participation during the year 2020-21

Sl. No.	Name of the event	Mode	Period
1	i-FPT (Food & Agro Processing Technology) Expo	Virtual	22nd July to 21st October, 2020
2	FMCG & Supply Chain Expo (VFSC - 2020) - FICCI	Virtual	27th to 31st July, 2020
3	6th India - CLMV Business Conclave	Virtual	3rd to 4th December, 2020

Sl. No.	Name of the event	Mode	Period
4	FICCI's Annual Expo – 2020	Virtual	12th December, 2020 to 11th December, 2021
5	Geographical Indications Festival of India (GIFI)	Virtual	9th January to 8th February, 2021
6	GI Mahotsav – 2021, TRIFED, Mussoorie	Physical	4th to 5th March, 2021
7	6th Act East Business Conclave at Guwahati	Physical	19th to 23rd March, 2021
8	Indus Food at New Delhi	Physical	20th to 21st March, 2021

During these events, demonstrations were also organized on how to prepare a good cup of Coffee and also making the people aware of career opportunities in the Coffee sector.

Apart from the above, the Coffee Board is promoting sale of pure and high quality Indian Coffee across various locations in the country through India Coffee House and India Coffee Depots. At present, 12 such units are functioning across the country.

Emphasis has also been given for promotion of Coffee through digital media, focusing on strengths of Indian Coffee like eco-friendly, shade grown and sustainable Coffee, popularizing Coffee as favourite beverage among youth.

Training Programmes Conducted by Division of Coffee Quality

1. Kaapi Shastra Training Programme

The objective of this training programme is to create awareness of the latest technologies in the Coffee roasting, grinding and packaging industry and to demonstrate the techniques for brewing good quality Coffee. A total of three programs were conducted during 2020-21 and 52 participants have attended the program at Head Office.

Sl. No.	Venue	Particulars	No. of Participants
1	HO, Bengaluru	07th - 11th December 2020	16
2	HO, Bengaluru	18th - 22nd January 2021	16
3	HO, Bengaluru	15th - 19th February 2021	20
Total			**52**

2. Focus Group Discussion

The main objective of the program is to understand the drivers and barriers to Coffee consumption.

Sl. No.	Venue and Particulars	No. of Participants
1	Tea and Coffee Association, NAVI Coffee, Mumbai on 24th February 2021	18
2	On the House Café, Jaipur on 23rd February 2021	09
3	BABA's Beans Café @ The Aloft Hotel, Delhi on 22nd February 2021	15
Total		**42**

Post Graduate Diploma in Coffee Quality Management

Fifteen students have joined during 2019-20 batch and they completed the second trimester at Coffee Quality Division. The third trimester classes has commenced from March 2021 at Head Office, Bengaluru. Twelve students have joined the 2020-21 batch and currently they are in I trimester at CCRI, Balehonnur.

3. Support to Small Grower Collectives / SHGs / Cooperatives for Coffee marketing

Coffee Board introduced a new sub-component in the XII Plan to support growers' collectives/ Self Help Groups/ Cooperatives of small and tiny growers by extending suitable financial incentives, for taking up marketing of Coffee produced on community based approach. This not only helps to improve the quality of Coffee but also realize better value for their Coffees produced and marketed. The scheme provides a mechanism for better price realization for the group, arising out of both the improvement of quality as well as collective bargaining. The Coffee marketing under this component should be taken up through public auction platform like Indian Coffee Trade Association (ICTA) or direct export or through the recognized Commodity Exchanges wherein, physical delivery of Coffee takes place and later furnish the claim to the Board for reimbursement. Coffee Board will provide the subsidy at ₹4.00 per kg of clean Coffee marketed.

B) Support for Value Addition

A Step in the Direction of Value Addition

In the world Coffee chain hardly 40% of the Coffee economy is in the producing countries while the remaining 60% is captured by consuming countries. Over the years consuming countries have improved the capabilities of processing, manufacturing and marketing Coffee as an end product. Adoption of latest technologies in roasting, grinding and packaging is critical for the sustained development of Coffee value chain and the market. Processing, packaging and marketing of Coffee in the domestic market

would also provide ample opportunities for employment generation especially through small and medium enterprises. As the modern technologies in the areas of Coffee roasting, grinding and packaging are capital intensive; it inhibits the Small and Medium Enterprises (SMEs) to venture into taking up Coffee value addition activities. Therefore, it is found necessary to extend appropriate support to the entrepreneurs to acquire the suitable technology to manufacture and package good quality Coffee powder.

Coffee Board is supporting R&G units by providing subsidy under XII plan MTF scheme component 10 Support for Value Addition.

The details are given below

a) Support to R&G units

The main objective is to enhance quality of Coffee product and achieve value addition through introduction of improved technologies in roasting, grinding and packaging which will result in boosting domestic Coffee consumption and entrepreneurship in the Coffee sector. Support is being extended to Individual units, Partnership firms, Self-Help-Groups (SHG)/Growers' collectives, who are interested to establish Coffee roasting units and also those proposing to modernize the existing units with new automated / energy saving / eco-friendly machinery.

The Components Eligible for Subsidy

i. Roasting Unit, Gourmet Roasting unit 1Kg to < 10 Kg/batch and small roasting units with a capacity of less than 25 Kg capacity are eligible for subsidy support of 40% of the machinery cost with a ceiling of ₹10 lakhs.

ii. For the SHGs, Women Entrepreneurs, SC/ST, Minorities and differently abled beneficiaries, subsidy support is at 50% of the machinery cost with a ceiling of ₹10 lakhs.

Support to gourmet roaster units would enable roasting of specialised blends in smaller quantities. This may also help to encourage large number of small players/new entrepreneurs to take up this venture in non-traditional Coffee drinking areas.

New Units

The roasting, grinding and packaging machinery in any of the following combinations are eligible for subsidy.

a) Roasting machine, grinding machine and packaging machine.

b) Roasting machine and packaging machine.

c) Grinding machine and Packaging machine.

During the year, subsidy was provided for nine R&G units under this component.

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CHAPTER - VII

EXPORT PROMOTION

Coffee Exports
Exporter Registration and Renewal

The total number of exporters registered with Coffee Board as on 31st March 2021 were 1,423 as against 1,236 on 31st March, 2020. This includes 187 new registrations and 86 Renewal of registrations made during the year 2020-21.

Export Permits and ICO Certificate of Origin

Coffee Board is issuing Export Permit under Section 20 of Coffee Act for export of Coffee. As per the Article 33 of the International Coffee Agreement, 2007, London, Coffee Board also issues Certificate of Origin for the export of Coffee to the registered exporters of Coffee.

Exports: E- Permit System

Export permits and ICO Certificates of Origin are being issued against the online applications filed on www.indiacoffee.org/permit. The facility of online filing of export permit and submission of return of confirmation of exports have been extended by providing User-Id and Password to all the registered exporters for both Indian and re-exported Coffee. A total of 11,446 export permits and ICO Certificates of Origin have been issued to 268 Registered Exporters of Coffee during the year 2020-21 as against 11,546 permits issued during 2019-20. Out of 11,446 permits, 9,270 permits were issued for export of Indian origin Coffee and 2,176 permits were issued for re-export of imported Coffee after value addition.

Export facilitation measures

Under Minimizing Regulatory Compliances for Ease of Doing Business and to facilitate Coffee exports during COVID-19 pandemic. During 2020-21, Coffee Board has implemented online issuance with digitally signed Coffee export documents *viz.,* Registration cum Membership Certificate (RCMC) at https://www.indiacoffee.org/ERCMC_Application.aspx, Export permit (Form C) and International Coffee Organization (ICO) certificate of origin at https://www.indiacoffee.org/permit. Further, Coffee Board increased the periodicity of renewal of RCMC certificate from 3 years to 5 years as per Foreign Trade Policy and the validity period of export permit and ICO Certificate of Origin have been extended from 30 days to 60 days.

Interactions with Exporters

Meetings with Coffee Exporters and Exporters Association/Specialty Coffee Association were held during the year. The meetings deliberated on the various stakeholders issues relating to the Export Promotion Scheme, participation in the international events, trade fairs, quality issues, financial assistance etc. All the relevant issues were taken up with the Ministry for appropriate intervention and support.

Reports and Returns

Periodical reports and returns on Coffee exports were generated and furnished to the Ministry and to the International Coffee Organization apart from dissemination of

information to the exporting community to help in their activities. The main reports and returns that were generated during the period are as under:

a. Daily report on export performance for Board's website and Board's Officers.
b. Monthly report to Ministry through Technical Officer, Coffee Board, HO.
c. Monthly reports to International Coffee Organization (ICO) on volume and value by destinations on preliminary exports of Coffee.
d. Statistical data to International Coffee Organization on monthly basis regarding the ICO Certificates of Origin issued for Coffee exported from India.

Apart from the above, reports on exports- Exporter wise, Country wise, Type & Grade wise were generated.

Exportable Types & Grades of Coffee

The details of exportable Types & Grades of Coffee identified by the Board according to the Coffee Quality improvement program of International Coffee Organization (ICO) vide the Resolution No. 420 and subsequent modification in the existing standards of Monsooned Coffee as circulated vide MAR/ EXP/ 33. B / 2010-11/ 790 dated 18/08/2010 are as under:

Exportable Types and Grades of Coffee

Type	Premium Grades	Commercial Grades	Specialty Coffee
Green Coffee Arabica Parchment (Plantation) (Washed Arabica)	PB Bold AA	PB, A,B, C* Bulk	Mysore Nuggets EB
Arabica Cherry (Unwashed Arabica)	PB Bold, AA, A.	PB, AB., C** Bulk***	Monsooned Malabar - AAA Monsooned Malabar - AA Monsooned Malabar - A Monsooned Malabar Arabica Triage#
Robusta Parchment (Washed Robusta)	PB Bold, A	PB, AB, C Bulk	Robusta Kaapi Royale
Robusta Cherry (Unwashed Robusta)	PB Bold AAA, AA, A	PB, AB, C, Bulk, Clean Bulk	Monsooned Malabar Robusta - AA Monsooned Malabar Robusta Triage#
Miscellaneous grades Liberia Excelsia		 Bulk## Bulk##	
INSTANT Coffee			
ROASTED Coffee SEEDS			
ROASTED & GROUND Coffee			

* Exception is available for Plantation-C as indicated in the description of equivalent given in the footnote of the ICO Resolution 407/420.

** Arabica Cherry 'C' should be free from Blacks, Browns and Bits.

*** Arabica Cherry Bulk should contain less than 10% Blacks, Browns and Bits.

Monsooned Arabica Triage and Monsooned Robusta Triage should be free from Blacks, Browns and Bits.

On same defect count as of Robusta.

Note: Moisture level 13.0 - 14.5% for Monsooned Coffees

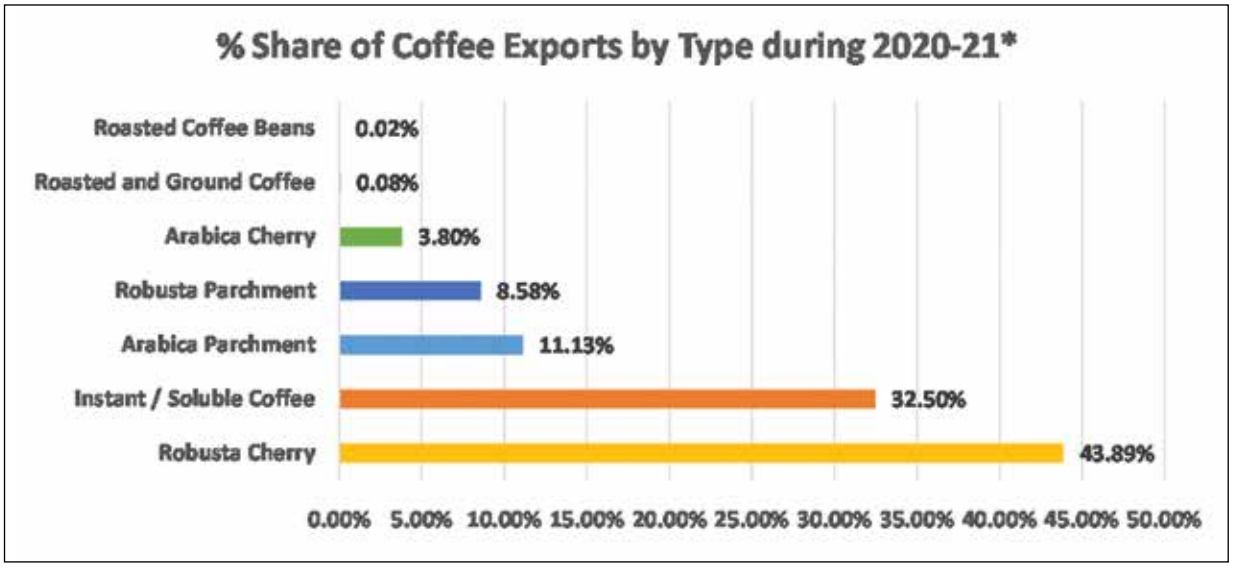
Coffee Exports

During 2020-21, export permits for export of 3,10,692 MT of Coffee (including 77,390 MT of re-exports) were issued valued at ₹5,452 crores equivalent to US$ 735 million with a unit value of ₹1,75,477 per MT. During the year 2019-20, export permits were issued for export of Coffee to the tune of 3,27,413 MT of Coffee (including 92,386 MT of re-exports) valued at ₹5,215 crores equivalent to US$ 736 million with a unit value of ₹1,59,268 per MT. During 2020-21, export permits were issued for export of Coffee to 125 countries as against 118 countries in the previous year, out of which Italy, Germany, Belgium, Russian Federation and Poland were the top five export destinations for Indian Coffees.

Types of Coffee Exports 2020-21*

Type of Coffee	Quantity in Tonnes* (GBE)	Percentage to Total Exports
Arabica Parchment	34586	11.13
Arabica Cherry	11795	3.80
Robusta Parchment	26662	8.58
Robusta Cherry	136365	43.89
Roasted Coffee Beans	57	0.02
Roasted and Ground Coffee	262	0.08
Instant / Soluble Coffee	100965	32.50
Total	**310692**	**100.00**

GBE-Green Bean Equivalent.
*Based on the export permits issued



*Based on export permits issued

Grade Wise Details of Coffee Exports during 2020-2021*
(Both Indian and Re-Exported Coffee)

Sl. No.	GRADE	Quantity (Tonnes)	Value (₹ Lakhs)	Value ($Lakhs)	Unit Value (₹/Tonne)	Unit Value $/Tonne
1	ARABICA CHERRY-A	479	1025.33	13.91	214172	2906
2	ARABICA CHERRY-AA	647	1320.04	17.82	203985	2754
3	ARABICA CHERRY-AB	3824	6506.42	86.96	170134	2274
4	ARABICA CHERRY-BULK	39	229.95	3.10	586009	7900
5	ARABICA CHERRY-C	508	635.55	8.56	125123	1685
6	ARABICA CHERRY-PB	101	163.91	2.25	162609	2232
7	INSTANT Coffee	100965	185966.75	2512.49	184191	2488
8	LIBERIA BULK	234	777.10	10.54	173370	4500
9	MON. MALABAR ARABICA-AAA	56	160.87	2.19	289127	3936
10	MON. MALABAR AR. TRIAGE	35	51.34	0.69	148812	2000
11	MON. MALABAR ARABICA-A	327	770.96	10.44	235696	3192
12	MON. MALABAR ARABICA-AA	5780	15291.43	207.12	264557	3583
13	MON.MALABAR ROBUSTA-AA	1512	2930.62	39.66	193772	2622
14	MYSORE NUGGETS-EB	2670	8630.87	116.80	323262	4375
15	PLANTAION-PB BOLD	19	35.36	0.48	183479	2491
16	PLANTATION-A	11537	33999.78	459.42	294704	3982
17	PLANTATION-AA	8892	26346.82	355.79	296310	4001
18	PLANTATION-B	6161	14644.12	197.38	237709	3204
19	PLANTATION-BULK	2314	7790.62	104.97	336662	4536
20	PLANTATION-C	2161	4094.20	54.91	189419	2540
21	PLANTATION-PB	832	2015.83	27.20	242262	3269
22	ROASTED & GROUND Coffee	262	924.53	12.48	352337	4756
23	ROASTED Coffee SEEDS	57	165.38	2.24	289131	3916
24	ROBUSTA CHERRY AAA	5494	7893.17	106.39	143674	1937
25	ROBUSTA CHERRY-A	25122	35756.89	480.86	142333	1914
26	ROBUSTA CHERRY-AA	21658	31420.70	423.44	145074	1955
27	ROBUSTA CHERRY-AB	63484	86048.80	1157.69	135543	1824
28	ROBUSTA CHERRY-BULK	2739	3805.34	51.16	138943	1868
29	ROBUSTA CHERRY-C	331	412.18	5.47	124601	1654
30	ROBUSTA CHERRY-PB	3869	5214.44	70.40	134778	1820
31	ROBUSTA CHY CLEAN BK.	11921	14480.08	194.89	121464	1635
32	ROBUSTA KAAPI ROYALE	7192	12778.88	171.45	177684	2384
33	ROBUSTA PARCHMENT-A	418	760.12	10.10	182037	2419
34	ROBUSTA PARCHMENT-AB	12232	21284.68	284.81	174008	2328
35	ROBUSTA PARCHMENT-C	1792	2564.82	34.87	143153	1946
36	ROBUSTA PARCHMENT-PB	1722	2680.26	36.09	155675	2096
37	ROBUSTA PMT.-BULK	3307	5614.68	74.84	169776	2263
	Total	**310692**	**545193**	**7350**	**175477**	**2365**

Quantity in Green Bean Equivalent *Based on export permit issued

Country Wise details of Coffee Exports During 2020-21*
[Both Indian & Re-Exported Coffee]

Sl. No.	Name of the Country	Quantity in Tonnes	Value (₹Lakhs)	Value ($Lakhs)
1	ITALY	59002	85601.36	1151.22
2	GERMANY	32205	54642.27	734.16
3	BELGIUM	23856	42869.98	576.95
4	RUSSIAN FEDERATION	16179	27650.45	374.14
5	POLAND	11749	25449.63	343.25
6	LIBYA	9790	14147.63	190.55
7	JORDAN	9197	25067.19	338.31
8	MALAYSIA	8588	11363.18	153.39
9	U.S.A.	8072	16339.58	220.96
10	KUWAIT	6647	17262.61	233.35
11	AUSTRALIA	6168	11777.89	158.73
12	TURKEY	6029	8887.76	120.15
13	UKRAINE	5711	8382.92	113.07
14	GREECE	5503	8251.35	111.14
15	SPAIN	5330	7494.52	100.87
16	SWITZERLAND	4978	10241.37	137.66
17	ISRAEL	4780	7501.25	101.06
18	UNITED ARAB EMIRATES	4839	10764.22	145.55
19	KOREA REPUBLIC OF S	4269	6552.51	87.92
20	SLOVENIA	4155	5442.58	72.72
21	SAUDI ARABIA	3793	9932.45	134.79
22	EGYPT	3764	6091.53	82.40
23	CROATIA	3573	4625.98	62.08
24	UNITED KINGDOM	3388	8228.79	110.14
25	IRAN,ISLAMIC R/O	3253	4620.68	62.46
26	TAIWAN	3134	4790.61	64.37
27	MALI	3100	5408.29	73.15
28	NETHERLANDS	3065	5415.55	72.86
29	BENIN	2838	5460.55	73.70
30	INDONESIA	2636	4833.35	65.62
31	NIGERIA	2510	4563.29	61.94
32	PORTUGAL	2441	3297.08	44.52
33	SYRIA	2054	2978.84	40.37
34	BANGLADESH	1835	3273.54	44.24
35	SINGAPORE	1645	3264.24	44.02
36	FRANCE	1631	2878.86	38.67
37	IRAQ	1447	3016.36	40.94
38	SENEGAL	1404	2812.36	38.04
39	MOROCCO	1368	2359.17	31.97
40	VIETNAM	1356	1692.84	22.87
41	ALBANIA	1317	2029.23	27.40

Sl. No.	Name of the Country	Quantity in Tonnes	Value (₹Lakhs)	Value ($Lakhs)
42	TOGO	1216	2267.39	30.67
43	JAPAN	1148	2894.49	39.23
44	MAURITANIA	1144	3009.94	40.78
45	LATVIA	1126	1770.00	23.86
46	MONTENEGRO	1122	1508.56	20.26
47	MYANMAR	985	1340.78	18.12
48	GHANA	848	1841.29	25.11
49	BURKINA FASO	801	1799.83	24.25
50	ALGERIA	791	1169.00	15.62
51	NEPAL	765	2829.83	38.33
52	CHINA,PEOPLE'S R/O	729	1230.14	16.65
53	ROMANIA	674	1061.12	14.35
54	CANADA	673	1255.82	16.92
55	TURKMENISTAN	644	1351.00	18.40
56	GUINEA	642	5564.30	75.56
57	IVORY COAST	601	1141.53	15.36
58	SULTANATE OF OMAN	594	1343.23	18.15
59	NIGER	545	1006.59	13.65
60	BULGARIA	519	750.62	10.05
61	UZBEKISTAN	511	728.74	9.82
62	GAMBIA	495	1107.72	15.01
63	GEORGIA	477	825.63	11.12
64	LEBANON	402	860.16	11.71
65	CAMEROON	389	787.65	10.68
66	FINLAND	383	690.79	9.36
67	NEW ZEALAND	374	771.23	10.35
68	TUNISIA	262	598.01	8.08
69	OMAN	216	337.11	4.53
70	CONGO	197	493.28	6.72
71	NORWAY	196	546.34	7.37
72	SOUTH AFRICA	177	305.21	4.11
73	KENYA	170	234.99	3.18
74	QATAR	168	468.82	6.36
75	SWEDEN	158	349.36	4.68
76	ARMENIA	157	301.48	4.04
77	CYPRUS	149	223.69	3.05
78	GABON	138	287.32	3.85
79	KAZAKHSTAN	130	237.65	3.23
80	BELARUS	117	180.00	2.40
81	SRI LANKA	110	248.30	3.38
82	KOREA,PEOPLE'S R/O-N	104	161.03	2.16
83	EL SALVADOR	93	158.97	2.14
84	CHAD	82	178.11	2.40

Sl. No.	Name of the Country	Quantity in Tonnes	Value (₹Lakhs)	Value ($Lakhs)
85	LITHUANIA	71	141.51	1.91
86	DENMARK	67	70.54	0.94
87	BOTSWANA	60	79.60	1.07
88	AUSTRIA	49	62.93	0.87
89	TANZANIA	46	71.45	0.96
90	KOSOVO	41	62.20	0.85
91	ARGENTINA	40	53.22	0.72
92	SLOVAKIA	39	60.68	0.82
93	BAHRAIN	39	132.15	1.79
94	MOLDOVA	36	96.64	1.30
95	ESTONIA	32	46.83	0.63
96	SIERRA LEONE	31	65.76	0.87
97	AZERBAIJAN	30	47.23	0.64
98	EQUATORIAL GUINEA	26	41.25	0.55
99	MALDIVES	24	57.64	0.78
100	BHUTAN	23	74.87	1.01
101	HONG KONG	23	37.85	0.50
102	MONGOLIA	20	32.08	0.43
103	MALTA	19	26.48	0.35
104	IRELAND	19	44.85	0.62
105	THAILAND	19	65.83	0.89
106	NAURU	18	33.64	0.45
107	LUXEMBOURG	16	91.18	1.24
108	MEXICO	15	40.78	0.55
109	FIJI	13	32.09	0.44
110	CENTRAL AFRICAN REPUBLIC	10	23.78	0.32
111	UGANDA	9	24.70	0.33
112	TRINIDAD AND TOBAGO	8	21.73	0.30
113	MICRONESIA	7	24.49	0.34
114	PERU	7	13.60	0.18
115	SUDAN	5	11.33	0.15
116	CZECH REPUBLIC	4	1.12	0.01
117	ANGOLA	2	3.74	0.05
118	MACEDONIA	1.60	8.81	0.12
119	GUYANA	1.56	3.71	0.05
120	CAMBODIA	0.19	0.15	0.00
121	SEYCHELLES	0.17	0.26	0.00
122	HUNGARY	0.10	0.20	0.00
123	BRAZIL	0.07	4.72	0.06
124	BRUNEI DARUSSALAM	0.03	0.14	0.00
125	MAURITIUS	0.01	0.20	0.00
	Total	**310692**	**545193**	**7350**

Quantity in Green Bean Equivalent *Based on Export Permit issued

Country Wise details of Coffee Exports During 2020-21*
(Re-exported Coffee)

Sl. No.	Name of the Country	Quantity (Tonnes)	Value (₹ Lakhs)	Value ($ Lakhs)
1	RUSSIAN FEDERATION	11298	19527.56	263.85
2	POLAND	11148	24524.57	330.68
3	MALAYSIA	6862	9850.80	133.00
4	TURKEY	3835	5535.23	74.95
5	U.S.A.	3249	5790.69	77.91
6	UKRAINE	2865	4128.29	55.65
7	INDONESIA	2636	4833.35	65.62
8	BENIN	2522	4891.75	66.01
9	SWITZERLAND	2475	5236.41	70.21
10	TAIWAN	2002	2828.41	37.96
11	BANGLADESH	1534	2833.04	38.26
12	NIGERIA	1522	2640.65	35.85
13	NETHERLANDS	1522	2542.63	34.27
14	UNITED KINGDOM	1520	2909.73	38.94
15	VIETNAM	1334	1660.13	22.44
16	MALI	1201	2082.92	28.14
17	ISRAEL	1112	1696.86	22.82
18	MAURITANIA	1027	2795.82	37.89
19	ITALY	981	1286.98	17.47
20	TOGO	955	1744.60	23.57
21	UNITED ARAB EMIRATES	924	1678.59	22.71
22	BELGIUM	772	1078.89	14.60
23	SINGAPORE	745	1419.37	19.07
24	LIBYA	741	920.92	12.35
25	IRAQ	739	1434.33	19.42
26	SENEGAL	714	1293.94	17.45
27	SYRIA	666	826.16	11.20
28	SPAIN	568	982.47	13.20
29	IVORY COAST	556	1027.21	13.82
30	UZBEKISTAN	465	640.79	8.64
31	GERMANY	427	687.40	9.31
32	AUSTRALIA	425	812.56	10.92
33	LATVIA	419	750.71	10.14
34	ROMANIA	411	598.96	8.10
35	SAUDI ARABIA	395	662.48	8.90
36	CHINA,PEOPLE'S R/O	374	574.22	7.72
37	IRAN,ISLAMIC R/O	368	533.40	7.21
38	TURKMENISTAN	357	707.17	9.60
39	GAMBIA	356	788.16	10.66
40	GHANA	353	677.90	9.23
41	GUINEA	341	802.81	10.76
42	BULGARIA	302	471.85	6.29
43	CAMEROON	295	616.22	8.37
44	NIGER	293	511.44	6.91
45	JAPAN	292	584.15	7.96
46	TUNISIA	262	598.01	8.08

Sl. No.	Name of the Country	Quantity (Tonnes)	Value (₹ Lakhs)	Value ($ Lakhs)
47	LEBANON	230	488.57	6.67
48	GEORGIA	227	408.46	5.49
49	KOREA REPUBLIC OF S	196	317.24	4.27
50	BURKINA FASO	190	416.15	5.61
51	KENYA	169	234.08	3.17
52	FINLAND	148	284.33	3.91
53	ARMENIA	138	244.11	3.26
54	GABON	136	281.92	3.78
55	CYPRUS	130	195.15	2.66
56	CONGO	109	254.91	3.48
57	KAZAKHSTAN	102	171.85	2.33
58	EL SALVADOR	93	158.97	2.14
59	JORDAN	92	140.64	1.91
60	FRANCE	91	137.62	1.84
61	EGYPT	81	129.46	1.74
62	BELARUS	79	113.38	1.51
63	CROATIA	74	112.33	1.51
64	NEW ZEALAND	72	134.34	1.77
65	NEPAL	70	123.01	1.67
66	KOREA,PEOPLE'S R/O-N	62	90.21	1.22
67	BOTSWANA	60	79.60	1.07
68	TAHITI	59	122.43	1.65
69	SLOVENIA	55	75.22	1.01
70	SOUTH AFRICA	53	96.18	1.30
71	AUSTRIA	49	62.69	0.87
72	TANZANIA	46	71.45	0.96
73	GREECE	46	67.53	0.91
74	KOSOVO	41	62.20	0.85
75	SLOVAKIA	39	60.68	0.82
76	LITHUANIA	33	70.63	0.94
77	SIERRA LEONE	31	65.76	0.87
78	SRI LANKA	31	65.20	0.88
79	AZERBAIJAN	30	47.23	0.64
80	EQUATORIAL GUINEA	26	41.25	0.55
81	CHAD	22	51.31	0.68
82	MONGOLIA	20	32.08	0.43
83	IRELAND	19	44.20	0.61
84	ALGERIA	18	37.32	0.50
85	MOROCCO	14	529.49	7.22
86	FIJI	13	32.09	0.44
87	MALDIVES	12	29.34	0.40
88	CENTRAL AFRICAN	10	23.78	0.32
89	MICRONESIA	7	24.49	0.34
90	SUDAN	5	11.33	0.15
91	SHARJAH	0.30	0.74	0.01
92	HONG KONG	0.13	0.61	0.01
	Total	**77390**	**137262**	**1852**

Quantity in Green Bean Equivalent *Based on Export Permit issued

Top 10 Coffee Exporters during 2020-21*
[Both Indian & Re-Exported Coffee]

Sl. No.	Name of the Exporter	Quantity in Tonnes	Value in (₹ Lakhs)	Value ($ Lakhs)
1	CCL PRODUCTS INDIA LIMITED	33157	72162.00	975.11
2	ALLANASONS PRIVATE LIMITED	23102	44982.89	605.93
3	TATA COFFEE LIMITED	22931	44766.93	604.21
4	NKG INDIA COFFEE PRIVATE LIMITED	21026	31770.73	427.80
5	OLAM AGRO INDIA PRIVATE LIMITED	17204	32978.64	444.47
6	SUCDEN COFFEE INDIA PRIVATE LIMITED	15858	22506.35	303.07
7	EMIL TRADERS PRIVATE LIMITED	15443	20715.39	278.19
8	VIDYA HERBS PRIVATE LIMITED	14139	19954.58	269.86
9	VAYHAN COFFEE LIMITED	13597	22007.94	296.15
10	ECOM GILL COFFEE TRADING PRIVATE LIMITED	12468	21412.34	287.95
11	OTHERS	121768	211935.07	2857.18
	Total	**310692**	**545193.00**	**7350.00**

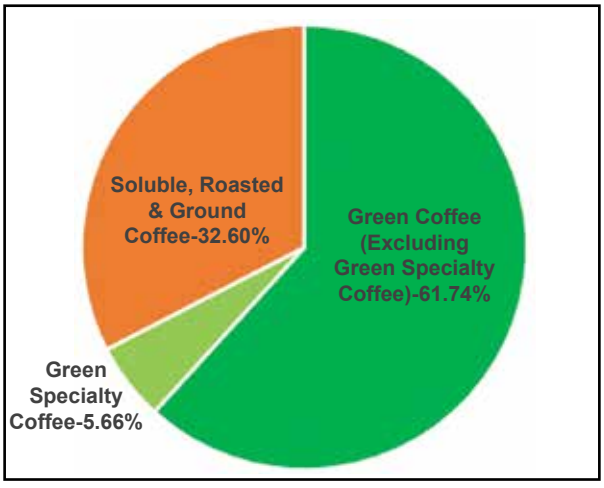
Quantity in Green Bean Equivalent *Based on the export permits issued.

Export of High Value Green Coffee and Specialty Coffee and Value Added Coffee during 2020-2021*

Sl. No	Types of Coffee	Quantity in Tonnes	Value in ₹Lakhs
1	Green Coffee (Excluding Green Specialty Coffee)	191836	317521
2	Green Specialty Coffee	17572	40615
3	Soluble, Roasted & Ground Coffee	101284	187057
	Total	**310692**	**545193**

Quantity in Green Bean Equivalent *Based on the export permits issued.

Percentage Share of Green Coffee, Specialty Coffee and Value Added Coffee in Total Exports during 2020-2021 (Provisional)



Export promotion scheme - Providing Transit/Freight Assistance for Coffee Exports

Under export promotion scheme, Coffee Board is extending Transit/Freight assistance for Coffee Exports. The objective of the scheme is to maximize export earnings by enhancing the market share of value added Coffees by India Brand building and high value differentiated Coffees in important high value international markets. The Export Incentives disbursed during 2020-21 are as follows.

Scale of Transit/Freight Assistance

i) ₹2/- per kg. for the export of High Value Green Coffees to far off high value markets *viz.,* U.S.A., Canada, Japan, Australia, New Zealand, South Korea, Finland and Norway.

ii) ₹3/- per Kg. for export of Value Added Coffees in retail consumer packs exported as 'India Brand', calculated on the Green Coffee utilized for its manufacture/ preparation at the rate of maximum of 2.6 kg for Instant/Soluble Coffee and 1.19 kgs for Roasted Coffee seeds and R & G Coffees.

Sl. No.	Components	Quantity in Tonnes	Amount in ₹Lakhs
1	Incentive extended for export of High Value Green Coffee to far off markets at ₹2/-Kg	14640	292.81
2	Incentive extended for export of Value Added Coffee in retail packs as India Brand at ₹3/-Kg	3463	103.89
	Total	**18103**	**396.70**

Logos for Branding of Indian Coffee

Coffee Board of India continued to promote the export of value added Coffees as India Brand and to strengthen the identity of Indian Coffee through *Coffees of India* logos depicting Indian Coffee as shade grown, sustainable and scintillating. This symbolically describes the fact that Indian Coffee is shade grown and Coffee growing regions in India are one of the 25 bio-diversity hotspots of the world and also highlights the diversity of Coffees grown in India.

Coffees of India

Export Logo

Geographical Indication (GI)

With a view to protect and promote the unique Regional and Specialty Coffees of India, Coffee Board has obtained Geographical Indications registration for seven Coffees, further to which, the Board is facilitating authorised user registration of these Coffees by the stakeholders of the Coffee value chain. In this regard, eight applications of authorised user registration pertaining to Coffee grown in Board's Research Farms and Technology Evaluation Centres were sent to the GI registry. Three applications received from the stakeholders were processed, verified and the No objection Certificate (NoC) has been sent to GI registry. Five more applications have been received for Authorized user registration of Geographical indication tagged Coorg Arabica Coffee which is in progress. The Coffee Board in association with Codagu Planters Association (CPA) conducted awareness program on Authorized user registration on GI tag along with Coffee quality & cupping workshop to Coffee growers on 29th January 2021 at Coffee Research Sub Station, Chettalli, Karnataka.

Trade Infrastructure Export Scheme (TIES)

Coffee Board established a state-of the- art Laboratory Infrastructure for Coffee Quality & Export Certification under the Trade Infrastructure for Export Scheme (TIES) of Ministry of Commerce and Industry, Government of India for facilitating quality certification for exports and domestic market and monitor the quality of Coffee imported into the country. All the laboratories are functional and the process for National Accreditation Board for Testing and Calibration Laboratories (NABL) accreditation is initiated. M/s AnalytiQal Consultants & Experts were hired as a service provider. All the Technical staff members of Coffee Quality Division attended the following training programmes conducted by M/s AnalytiQal Consultants & Experts for regarding NABL accreditation as per ISO/IEC 17025 : 2017 for TIES laboratories.

Sl. No.	Training Programme	Date
1	Induction training programme on ISO/IEC 17025 : 2017	01st February 2021
2	Understanding of Requirements of ISO/IEC/17025 : 2017	11th - 12th February 2021
3	Measurement uncertainty as per ISO/IEC 17025 : 2017	09th - 10th March 2021

External Promotion

Under export promotion, the main activities carried out are centered around the following:

1. Participation in selected international food & beverages fairs, Coffee Conferences & Exhibitions etc., both directly and through the India Trade Promotion Organization (ITPO).
2. Giving visibility to Coffees of India & Coffee Export Logo in the events to support India Branding.
3. India Shows organized with support of Ministry of Commerce to strengthen the international trade presence.
4. Arranging Coffee tasting sessions, buyer-seller meets etc. involving foreign buyers, Indian exporters and Indian Missions abroad.
5. Circulation of various publicity and promotional literatures, DVDs, Films etc., on Coffees of India in overseas events.

During 2020-21 due to global COVID-19 pandemic, the Coffee Board has not participated in any of the physical events for export promotion. Alternatively the Coffee Board has undertaken the following activities through virtual platform.

Sl. No.	Name of the Event & Country	Date of event
1	Participated in Virtual Buyer Seller Meet with buyers from Dubai, UAE; promotion for GI products (Organized by APEDA in association with Indian Missions).	October 28th, 2020
2	Participated in Virtual Buyer Seller Meet with buyers from Washington, D.C, USA for promotion of GI products (Organized by APEDA in association with Embassy of India).	October 28th, 2020
3	Organized Virtual Business Network Meet on Coffees of India with buyers from South Korea (Joint event of Coffee Board, Embassy of India, Seoul, Indian Chamber of Commerce in South Korea and South Korea Trade-Investment Promotion Agency).	January 28th, 2021
4	Organized Virtual B2B meet of Indian Coffee Exporters with the Importers and stakeholders of USA Coffee & Hospitality Industry. (Joint event of Coffee Board & Consulate General of India, New York City, USA).	February 25th, 2021
5	Organized Virtual Business Network Meet / BSM on Coffees of India with Japan. (Joint event of Coffee Board and Embassy of India, Tokyo, Japan). Japanese Cos. in Coffee sector. SCAJ & Brook's Co Ltd, Japan.	March 2nd, 2021

Sl. No.	Name of the Event & Country	Date of event
6	Conducted Exploratory meeting with Enterprise Singapore (ESG). Initiated the steps for participation in Hybrid Coffee Auction and also for virtual BSM.	March 3rd & 9th, 2021
7	Participated in virtual event 'Collect if Café', (*a Paris-based French professional Coffee federation*). Under took publicity of Coffees of India through a live session on Indian Coffees.	March 25th, 2021

These virtual trade promotion events allowed exporters to reach the global market and connect with prospects from around the world. Further, virtual trade promotion events offered new opportunities for exporters, eliminating geographical barriers. Virtual events also helped in creating long lasting impressions, incredible interaction with focused buyers / sellers, marketing opportunities, strengthen trade ties. Besides, Virtual events helped in better value realization for Indian Coffees and created a platform for direct sales to targeted buyers.

Coffee Board made efforts for large-scale participation of Indian Coffee exporters and specialty Coffee growers for all these events. During the year, Coffee Board introduced corporate gift boxes containing high quality GI and other regional specialty Coffees for gifting VIPs and dignitaries in all overseas events and promotion through Indian Missions in important importing countries. As a part of Board's participation in global events in-association with Indian Missions, Board is updating country wise database / contact information of stakeholders including Coffee importers.

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CHAPTER – VIII

MARKET RESEARCH AND INTELLIGENCE

The Market Research & Intelligence Unit of the Board dealt with the following assignments during 2020-2021.

- ❖ The Unit continued to collect and compiled daily market information (both global and India) related to prices, supply, demand and other fundamental and technical factors that are important for market analysis. The same was disseminated to the industry as well as to the Government. During the year 2020-2021, a total of 175 daily market reports were generated and disseminated.
- ❖ Daily e-mail information service giving daily market analysis was continued during the period. The facility was extended to the growers via extension department and posted on the website https//www.indiacoffee.org/.
- ❖ The Unit published two issues of comprehensive 'Database on Coffee' for the months of September 2020 and January 2021. The Database on Coffee is very useful for policy makers and stakeholders.
- ❖ Crop estimations were carried out using stratified random sampling techniques across different category of holdings and Coffee zones/regions for the season 2020-2021.
  - Post-monsoon estimate for 2020-2021 was placed at 3,42,000 MT (Arabica 1,02,000 MT and Robusta 2,40,000 MT).
  - The final estimate for 2020-2021 is placed at 3,34,000 MT comprising of 99,000 MT of Arabica (30% of total) and 2,35,000 MT of Robusta (70% of total).
- ❖ The Unit rendered economic and analytical support on WTO and Trade policy matters related to Coffee. The Unit has identified the tariff barriers and tariff asymmetry for Indian Coffee exports in some of the importing countries and submitted the report to the Ministry to seek tariff concessions for Indian Coffee exports under different bilateral negotiations.
- ❖ The Government of India under Aatma Nirbhar Bharat Abhiyan has launched a centrally sponsored scheme 'Prime Minister Formalization of Micro Food Processing Enterprises (PMFME Scheme) and the Scheme is being implemented in association with the State Governments. The scheme adopts One District One Product (ODOP) approach to convert each District of the country into an Export Hub by identifying products with export potential in the District.

Accordingly, Coffee has been identified under ODOP approach in Kodagu district. In this regard, the Unit has provided the requisite inputs with respect to Coffee to the Karnataka State Agricultural Produce Processing and Export Corporation Limited (KAPPEC), the State nodal agency for the implementation of the scheme.

- The Unit has involved in the identification of potential Coffee markets by analysing the trade data and also prepared the country specific justification for the Board's participation in the Coffee Centric events to leverage the strengths of Indian Coffees in the overseas markets.
- Based on the inputs provided by the exporters, the Unit has worked out the Duties and Taxes associated with the export of Coffee products, which are not exempted or refunded under any other scheme and submitted a proposal to the Ministry for including Coffee under the coverage of Remission of Duties and Taxes on Exported Products (RoDTEP) scheme.
- The Unit involved in estimation of establishment cost for both Arabica and Robusta Coffee and same has been submitted to National Bank for Agriculture and Rural Development (NABARD) for the fixation of Unit Costs.
- The activities of the Export Section were coordinated by the unit.
- The Unit continued to be involved in the maintenance of the Board's website https//www.indiacoffee.org.
- The monthly "market watch" column in 'Indian Coffee' magazine was contributed by the unit.
- The Unit provided weekly estimated indicator prices for all the grades of Coffee to domestic auction centre, Indian Coffee Trade Association (ICTA).

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CHAPTER - IX

ACCOUNTS AND FINANCE

The Accounts and Finance Department of the Coffee Board has the following functions:

- Drawing up Budget Estimates and allocation of budget to various departments of the Board.
- Liaison with the Finance Division of the Ministry of Commerce for release of funds etc.
- Compilation and maintenance of accounts of the various departments of the Board
- Exercising effective control over cash and other financial transactions of the Board, so as to ensure cost efficient deployment of resources.
- Rendering advice on all matters having financial implications.
- Conducting Internal Audit of the offices of the Board.
- Dealing with pending issues of Pool Marketing like sales tax, payments etc.

The Board's accounts have been prepared in three sets *viz.,* Receipts and Payments, Income and Expenditure and Balance Sheet. Details of Grants-in-aid received from Government of India during the year 2020-21 and the expenditure under each head of account is given below:

(₹ in lakh)

Head Of Grant	Grants Received	Expenditure	Remarks
Grants-in-aid - General (ONER)	1100.00	1100.00	
Creation of Capital Assets - Plan (ONER)	50.00	50.00	
Subsidies (ONER) Plantation	2400.00	2400.00	
Subsidies - S.C. Sub-Plan	330.00	330.00	
Subsidies - Tribal Area Sub Plan	640.00	640.00	
Swachhta Action Plan - SAP	80.00	80.00	
Creation of Capital Assets - NER	1.00	1.00	
Subsidies - NER	400.00	365.00	35.00*
Grants-in-aid - General - NER	679.00	679.00	
Grants-in-aid - Salary	11320.00	11755.00	
Grants-in-aid - General	1000.00	1000.00	
Trade Infrastructure for Export Promotion (TIES)	0.00	11.00	47.00**
Total	**18000.00**	**18411.00**	**82.00**

Refunds

* NER - Subsidy - ₹35.00 lakh - refunded to Govt. of India

** TIES - Unspent grant refunded to Govt. of India - ₹47.00 lakh

Pension

The Pension Corpus of ₹24.77 crore (₹24,77,32,823/-) has been deposited as of 31.03.2021 in Nationalized Banks for earning interest. Total interest earned during the year was ₹1.49 crore (₹1,49,46,943/-). Pension payments to 2782 pensioners and pensionary benefits to those who have retired during the financial Year 2020-21 have been paid.

There are 189 employees in New Pension Scheme as of 31.03.2021 who joined the services of the Coffee Board after 01.01.2004.

Provident Fund

During the year, a sum of ₹7.55 crore (₹7,55,53,297/-) has been received as Provident Fund Subscription and refund of Provident Fund advances and a sum of ₹10.18 crore (₹10,18,12,522/-) has been disbursed as advance / partial final withdrawals and final settlement of PF. Surplus fund of ₹35.50 crore has been deposited in various nationalized Banks as per Coffee Act, 1942 and earned an interest of ₹2.20 crore (₹2,20,36,756/-) during the year.

Pool Fund

During the Coffee Pooling era, Pool Fund was raised from sale of Coffee pooled by the planters and the Board was responsible for marketing the pooled Coffee and made payment to the planters. This activity involved maintenance of establishment for propaganda for promotion of Coffee and for marketing of Coffee internal and international consumption. In 1995, the Board decided de-pooling of Coffee which necessitated voluntary retirement of surplus staff engaged for pooling activities. Accordingly, the retirement benefits and the ex-gratia were met out of the Pool Fund and amount outstanding was transferred to Corpus Fund for utilization for payment of pension to the retired employees. The surplus pool fund of ₹7.80 crore has been deposited in Indian Overseas Bank, Cantonment Branch.

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ABBREVIATIONS

AIC	Atal Incubation Centre
aω	Water Activity
BCRL	Bio-Control Research Laboratories
BIS	Bureau of Indian Standards
BIEC	Bengaluru International Exhibition Centre
BSM	Buyer Seller Meet
Bt	*Bacillus thuringiensis*
CODISSIA	Coimbatore District Small Scale Industries Association
cDNA	complementary DNA
CBB	Coffee Berry Borer
CCRI	Central Coffee Research Institute
CDRP	Coffee Debt Relief Package
CED	Centre for Entrepreneurship Development
CFC	Common Fund for Commodities
CIFC	Centro de Investigacao das Ferrugineus do Cafeeiro (Coffee Rust Research Centre)
CIE	Centre for Innovation and Entrepreneurship
CFU	Colony Forming Unit
CIS	Career Improvement Scheme
CLR	Coffee Leaf Rust
CRSS	Coffee Research Sub Station
CxR	Congensis x Robusta
CST	Central Sales Tax
DBT	Department of Biotechnology
DGFT	Director General of Foreign Trade
DNA	De-oxy-ribo Nucleic Acid
DVDs	Digital Video Discs
EU	European Union
EC	Emulsifying Concentration
FPOs	Farmer Producer Organizations
FSSAI	Food Safety and Standards Authority of India

FYM	Farm Yard Manure
GBE	Green Bean Equivalent
GIs	Geographical Indications
HDT	Hybrido-De-Timor
IAP	Internal Audit Party
IAS	Indian Administrative Service
IARI	Indian Agricultural Research Institute
ICAR	Indian Council of Agricultural Research
ICH	India Coffee House
ICO	International Coffee Organization
ICTA	Indian Coffee Trade Association
ICPMS	Inductively Coupled Plasma Mass Spectrometry
IDAS	Indian Defence Accounts Service
IMLVT	International Multi Location Variety Trial
INM	Integrated Nutrition Management
IPM	Integrated Pest Management
IICF	India International Coffee Festival
IIHR	Indian Institute of Horticulture Research
IIPM	Indian Institute of Plantation Management
ITDA	Integrated Tribal Development Agency
ITPO	India Trade Promotion Organization
IT	Information Technology
IEBR	Internal and Extra Budgetary Resources
JNU	Jawaharlal Nehru University
Kg/Ha.	Kilogram/Hectare
KGST	Kerala General Sales Tax
L	Litre
MACP	Modified Assured Career Progression
MFCS	Modified Flexible Complementary Scheme
MAS	Marker Assisted Selection
MENA	Middle East and North Africa
MPEDA	Marine Products Export Development Authority

MT	Metric Tonne
MTS	Multi Tasking Staff
MUTV	Multi Utility Tractor Vehicle
NABARD	National Bank for Agriculture and Rural Development
NBAII	National Bureau of Agriculturally Important Insects
NBC	National Barista Championship
NBFC	Non-Banking Financial Company
NBSS & LUP	National Bureau of Soil Survey and Land Use Planning
NCA	National Coffee Association
NER	North Eastern Region
NTA	Non-Traditional Areas
NPK	Nitrogen, Phosphorus, Potassium
NRCB	National Research Centre for Banana
OLIC	Official language Implementation Committee
PB	Pay Band
PCR	Polymerase Chain Reaction
PF	Provident Fund
PFA	Prevention of Food Adulteration
P & K	Phosphorus & Potassium
PSB	Phosphate Solubilizing Bacteria
PSFT	Price Stabilization Fund Trust
RAPD	Randomly Amplified Polimer Dolymorphic
RCRS	Regional Coffee Research Station
RCMC	Registration Cum Membership Certificate
R&G	Roasted & Ground
R&D	Research & Development
RIO	Regional Implementation Office
RISC	Rainfall Insurance Scheme for Coffee
RTI	Right to Information
RT PCR	Real Time Polymerase Chain Reaction
SC	Scheduled Caste
SCAA	Specialty Coffee Association of America

SCAE	Specialty Coffee Association of Europe
SCAR	Sequence Characterised Amplified Region
SEC	Socio Economic Class
SHG	Self Help Group
Sln	Selection
SLP	Special Leave Petition
SPAD	Soil Plant Analytical Development
SSP	Single Super Phosphate
ST	Scheduled Tribe
SRAP	Sequence Related Amplified Polymorphism
STAT	Sale Tax Appellate Tribunal
STEP	Short Term Executive Programme
TEC	Technology Evaluation Centre
TIES	Trade Infrastructure Exports Scheme
TOLIC	Town Official Language Implementation Committee
TVCs	Television Commercials
UAS	University of Agricultural Sciences
UNO	United Nations Organisation
UPASI	The United Planters' Association of Southern India
US cents/lb	US cents/pound
VAM	Vesicular Arbuscular Mycorrhiza
VAT	Value Added Tax
WA	Writ Appeal
WCR	World Coffee Research
WP	Wettable Powder
WSB	White Stem Borer
WBC	World Barista Championship
WTO	World Trade Organisation

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