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2021-22 – A PERSPECTIVE VIEW

Its my immense pleasure to release the 82nd Annual Report of Coffee Board for the year 2021-2022.

Coffee is one of the most traded agricultural commodities in the world. 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. Over 70 countries produce Coffee in significant amounts; in many of these, earnings from Coffee exports are of vital importance to the country's balance of payments. Coffee is an important agent of development, providing a livelihood for at least 100 million people across Coffee producing countries, generating cash returns in subsistence economies. Coffee production is an important source of rural employment for both men and women since cultural operations and harvesting in Coffee are labour-intensive. The top five Coffee producing countries *viz*., Brazil, Vietnam, Colombia, Indonesia and Ethiopia accounts for about 75% 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.

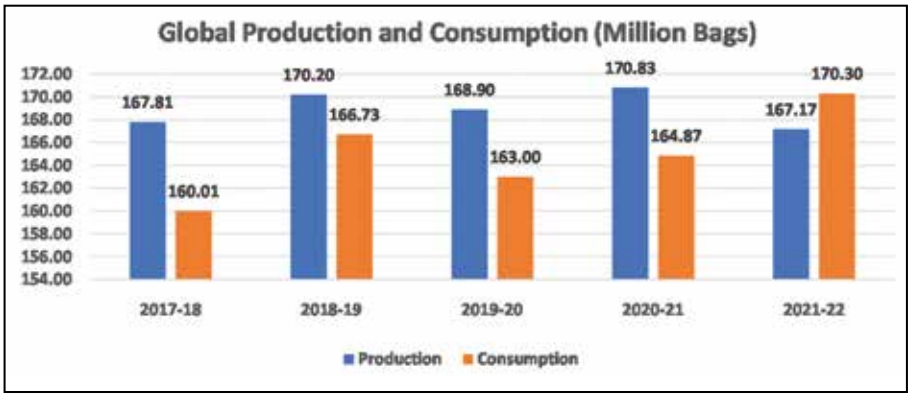
Coffee is predominantly an export-oriented commodity for the producing countries. India is the sixth largest exporter of Coffee in the world with the share of about 5.20% in global exports. Indian high-quality Coffees have created a niche for itself and earning high premiums in the international markets, especially Robusta which is highly preferred for its good blending quality.

In recent years, the major Coffee growing areas in the country are facing severe crisis situation as the Coffee growing regions of Karnataka have received heavy incessant rains with gusty wind resulted in substantial crop losses.

Coffee prices realized by the growers are generally linked to the international prices. The international Coffee prices are highly volatile and keep fluctuating depending upon the supply-demand balance. It is heartening to note that the prices of Coffee showing upward trend since October 2020 and reached to more than a decade high as ICO composite indicator price reached to 210.89 US cents/lb during February 2022.

Global Coffee Production & Consumption

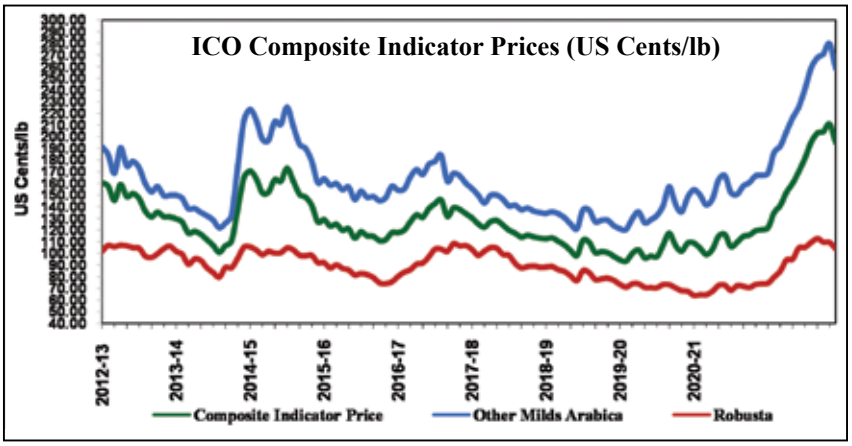
According to the International Coffee Organization, global Coffee production for the year 2021-22 is estimated at 167.17 million bags, representing a 2.1% decrease as compared to 170.83 million bags in 2020-21. World Coffee consumption for 2021-22 is projected at 170.30 million bags, an increase of 3.3% as compared to 164.87 million bags in Coffee year 2020-21. International Coffee Organisation (ICO) reported that, during the year 2021-22, consumption is projected to exceed production by 3.1 million bags.



Source: International Coffee Organization

International Prices

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 2021-22, the ICO composite indicator price rose by 55.31% to 172.50 US cents/lb over 111.07 US cents/lb in 2020-21. The price performance has been driven by reduction in production in key exporting countries like Brazil due to combination of drought and frost, logistical bottlenecks, increased crude oil prices and higher input costs. 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 47.57% to 230.86 US cents/lb compared to 156.44 US cents/lb in 2020-21. The prices for Other Milds ranged between 168.65 US cents/lb and 279.83 US cents/lb. Similarly, Robusta indicator prices recorded an increase of 41.43% to 98.63 US cents/lb compared to 69.74 US cents/lb in 2020-21. The indicator prices for Robusta ranged between 74.47 US cents/lb and 112.76 US cents/lb during 2021-22.



Source: International Coffee Organization

Indian Scenario

During the year 2021, the receipt of blossom and backing showers was satisfactory in all the Coffee growing tracts of the Traditional Areas, followed by normal weather conditions, which helped in retention of general soil moisture in Coffee plantations. The southwest monsoon set in the second fortnight of June 2021 with feeble note and gained its momentum through July-September months and brought in copious showers which helped in rejuvenation of tanks and streams, recharging of bore wells. The monsoon helped in maintaining the soil moisture and vegetative growth of the Coffee plants. The rainfall received during the monsoon period of 2021 was less in comparison to the corresponding period of 2020 in traditional areas. However, during North-East monsoon, depressions in Bay of Bengal and Arabian Sea led to medium to heavy rainfall during November 2021 affecting Coffee by dropping and splitting of fruits thereby reducing the Coffee quality and the yield of Robusta. Overall, the seasonal conditions prevailed during 2021-22 was favorable for the general health of plants and crop.

Production and Exports

Final estimate of Coffee production for 2021-2022 was placed at 3,42,000 tonnes, comprising of 95,000 tonnes of Arabica and 2,47,000 tonnes of Robusta, which is an increase of 2.40% over previous year's (2020-21) production of 3,34,000 tonnes comprising of 99,000 tonnes of Arabica and 2,35,000 tonnes of Robusta.

During 2021-22, India's Coffee exports achieved a record high level of USD 1033 million against the target of USD 1072 million set by the Government. Coffee exports recorded highest in both volume and value terms in 2021-22. During 2021-22, export permits for export of 4,16,247 tonnes of Coffee (including 93,972 tonnes of re-exports) were issued valued at ₹7,700 crores equivalent to US$ 1,033 million with a unit value of ₹2,46,464 per tonne. During the year 2020-21, export permits were issued for export of Coffee to the tune of 3,10,692 tonnes of Coffee (including 77,390 tonnes of re-exports) valued at ₹5,452 crores equivalent to US$ 735 million with a unit value of ₹1,75,477 per tonne. During 2021-22, export permits were issued for export of Coffee to 123 countries as against 125 countries in the previous year, out of which Italy, Germany, Belgium, Russian Federation and Jordan were the top five importing countries.

Domestic Prices

As per the prices prevailed in the auctions conducted by Indian Coffee Trade Association (ICTA), the domestic market price of Arabica (Plantation 'A') Coffee during 2021-22 ranged from ₹304/Kg to ₹416/Kg with an average of ₹352/Kg which is about 25% higher than the price prevailed during the previous year (₹282/Kg). The Robusta (Cherry 'AB') Coffee price during 2021-22 ranged from ₹138/Kg to ₹160/Kg with an average of ₹147/Kg which is an increase of 12% over the price prevailed during the previous year (₹131/ Kg).

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

Financial Year	2017-18	2018-19	2019-20	2020-2021	2021-22
Plant A	205	193	236	282	352
Robusta Chy. AB	125	137	139	131	147

Domestic consumption

The average growth rate of domestic Coffee consumption for all Coffee exporting countries is 3% while the consumption in India is growing at 3 to 4%. 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 tonnes. The growth of the robust domestic Coffee market is essential to protect Coffee growing sector in the wake of any international price fluctuations by acting as a buffer. This will provide a shield to the growers against volatile international Coffee prices, provide excellent employment opportunities, encouraging entrepreneurship and overall improvement in the value chain. To support the growing market, the Coffee 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'. During the year 2021-22, Coffee Board participated in 11 Expos in the country for promotion of domestic Coffee consumption through consumer awareness and education about positive effects of Coffee consumption on human health. 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.

Export Promotion

During 2021-22, due to global COVID-19 pandemic, Coffee Board did not participate in any of the physical events for export promotion. However, Coffee Board made systemic efforts to collaborate with Indian Missions abroad to promote Indian Coffees in the importing countries by organizing promotional programmes *viz.,* Coffee tasting sessions on Indian Coffees, participation in virtual Coffee festivals and organizing virtual buyer seller meets. 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, Coffee 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. Coffee Board organized the meetings with Coffee Exporters and Exporters Association / Specialty Coffee

Association and line departments for resolving the various stakeholders' issues for achieving the Coffee export target set by Government of India. Further, Coffee Board has taken up all the relevant issues raised by the Coffee exporters during the meetings with the Ministry and line departments for appropriate intervention and support.

Coffee Research

The Coffee Board Research Department has implemented a number of research projects during the year 2021-22 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 (Alluri Sitharama Raju 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 Private Ltd, Jalgaon, Maharashtra.

Coffee Board Programmes

During the year, the Coffee Board continued to implement the plan scheme "Integrated Coffee Development Project" during Medium Term Framework 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.

November, 2022
Bengaluru

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

CHAPTER - I

EXECUTIVE SUMMARY

Production

- The Final estimates for 2021-2022 were placed at 3,42,000 tonnes comprising of 95,000 tonnes of Arabica (28% of total) and 2,47,000 tonnes of Robusta (72% of total), which is an increase of 2.40% than the previous year's production of 3,34,000 tonnes.
- The overall farm productivity of coffee was 797 Kg/Ha.
- The total area planted with coffee was around 4.72 lakh hectares, of which the total bearing area was around 4.29 lakh hectares.
- There were around 4,06,691 coffee holdings in the country of which, around 4,03,793 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 4,16,247 tonnes of coffee (including 93,972 tonnes of re-exports) comprising of 46,867 MT of Arabica, 2,47,021 tonnes of Robusta and 1,22,359 tonnes of instant, Roasted coffee beans and Roast & Ground coffee valued at ₹7,700 crores equivalent to US$ 1,033 million was exported to 123 countries during the financial year 2021-2022.
- The top five export destinations for Indian Coffee were Italy, Germany, Belgium, Russian Federation and Jordan.
- The composite unit value of all types of coffee exported was ₹ 2,46,464 per tonne during the year 2021-2022.
- The total number of exporters registered with Coffee Board stood at 1,604 (including 181 new registrations and 102 Renewal of registration for the year 2021- 2022) as against 1,423 during the previous year.
- A total of 13,258 export permits (Indian origin coffee - 10,965 and re-exports - 2,293) and International Coffee Organization (ICO) Certificate of Origin were issued to 308 registered exporters of Coffee as against 11,446 permits issued during the previous year.

Research

- Evaluation of F_1 hybrids (S.5052-S.5059), developed with the objective of generating semi-dwarf cultivars with durable resistance by employing gene pyramiding strategy, indicated that among the eight hybrids S.5059 is superior with regard to yield (1,028 Kg/ha), field tolerance to Coffee leaf rust (12% of the population with mild susceptibility) and the highest percentage of 'A' grade beans (69%).
- During 2021-22, reciprocal crosses were effected between S.5441 and Sln.10

(donor for resistance to Coffee leaf rust) with an objective of integrating S_H3 gene in the semi-dwarf cultivar S.5441, as a pre-emptive breeding strategy.

- Among the four semi-dwarf F_1 progenies (S.5083 to S.5086), developed by the reciprocal crosses between Chandragiri (S.4202) x Sln.10, S.5086 and S.5085 have recorded the maximum yield of 1,322 Kg/ha & 1,185 Kg/ha respectively and maximum 'A' grade beans (69% & 70%). Both genotypes S.5085 and S.5086 have remained free from leaf rust incidence.
- At RCRS Thandigudi, Tamil Nadu, eleven hybrids (S.5309-S.5319) of Chandragiri x Sln.10 were evaluated and among these, S.5319 and S.5318 have recorded consistency with respect to yield (1,580 Kg/ha & 1,432 Kg/ha respectively) and field tolerance to Coffee leaf rust (0 to 20% of the population exhibited mild susceptibility).
- The hybrids (S.5168 & S.5171) generated between Cavimor (S.5149) x Sln.10 have manifested high field tolerance to Coffee leaf rust with an average yield of 930 Kg/ha.
- Four hybrid progenies (S.5117 to S.5120) evolved by crossing S.4889 and S.4890 with Sln.10 were monitored and among these, S.5119 has recorded the highest yield (874 Kg/ha) followed by S.5118 (823 Kg/ha) with high Coffee leaf rust tolerance (5.6% of the population exhibited mild tolerance to leaf rust).
- Towards the exploitation of F_1 hybrids for production improvement in Arabica, leaf samples of three promising hybrids (S.5059, S.5085 & S.5086) were to M/s. Jain Irrigation Systems Ltd. (JISL), Jalgaon, Maharashtra for large-scale multiplication through tissue culture under public-private partnership.
- Monitored the incidence of White Stem Borer (WSB) in the 30,000 tissue culture F_1 plants of S.4595 established in 27 locations in Karnataka and Tamil Nadu. The tissue culture plants are remained free from WSB incidence in all the locations during 2021-22 season.
- Towards validation of WSB tolerance under different agro-climatic conditions, 145.5 Kg seeds of the S.5355 (advanced line of Arabica S.4595) were supplied to growers during 2021-22 season.
- Continued the survey under the programme "Development of trait specific clonal varieties of Robusta" in Kodagu, Chikkamagaluru and Wayanad Districts and identified 104 new elite mother plants during the year 2021-22.
- Under the International collaborative Research Programme with WCR-IMLVT (World Coffee Research - International Multilocation Variety Trial), 28 Arabica varieties were evaluated for yield, quality, and field tolerance to Coffee leaf rust (CLR) disease. Among the 28 varieties, F_1 dwarf hybrid EC-16 has recorded the highest yield (884 Kg/ha) coupled with high field tolerance to CLR. While, among

the semi-dwarfs, the control variety 'Chandragiri' has recorded a high yield of 811 Kg/ha. Among the tall varieties the highest yield of 557 Kg/ha was recorded in control variety, Sln.9, followed by Sln.6 (551 Kg/ha). Highest percentage of 'A' grade bean was recorded in Pacamara (79%) followed by Parainema (67.3%).

- Monitored the growth parameters of six Robusta varieties (FRT-65, FRT-95, FRT-97, FRT-101, FRT-133 and FRT-134) introduced from Nestle R&D, France in comparison with three Indian Robusta selections (Sln.1R, Sln.2R & Sln.3R) under the collaborative Programme, "Introduction and evaluation of new Robusta Coffee varieties of Nestle R & D". The initial observations from the trial blocks established in three locations indicated that the growth parameters of the Nestle Robusta varieties, FRT-97 and FRT-65 are superior compared to other accessions.
- During the year 2021-22, a total quantity of 12,848 Kg seed Coffee comprising of 10,820 Kg of Arabica and 2,028 Kg of Robusta, was produced from the seed blocks established in Research Farms and Technology Evaluation Centres across India. Out of these 3,868.50 Kg was distributed to growers in traditional areas, 7,240 Kg was distributed to non-traditional areas and 1,739.50 Kg was distributed to growers in North-Eastern Region.
- Under the pilot programme for scaling up clonal propagation in Robusta, 44,233 CxR clones were distributed to 197 beneficiaries from Research Farms and Technology Evaluation Centres (TECs). Further, actions were initiated during 2021-22 to establish a new clonal production unit at TEC, Gonikoppal, Kodagu District, Karnataka.
- Genetic fidelity was assessed by comparative sequence analysis of three functional nuclear (NAC25, UGT and Znf) genes and one chloroplast (matK) gene. Nuclear genome showed higher degree of sequence variations in both *in-vitro* and seedling progenies, while chloroplast genome was highly conserved among seedling progenies. Genomic alterations in coding region were observed in zinc finger protein gene sequence of *in-vitro* derived plants.
- Molecular ITS (Internal Transcribed Spacer) based characterization led to the identification of four different fungal strains belonging to *Fusarium lateritium, Aschersonia spp., Ambrosiella xylebori and Acremonium spp.* that causes secondary infection at Coffee shot hole borer (SHB) infection site.
- Under studies on planting designs and pruning systems in Arabica Coffee *cv.,* Chandragiri, higher net returns of ₹1,41,685 ha^{-1} and B:C ratio (2) were obtained with high-density planting with hedge row system and cyclic pruning.

- In standardization of fertigation techniques in established Robusta Coffee (*cv.,* S.274), application of fertilizers through drip fertigation with 100% RDF (Recommended Dose of Fertilizer) as WSF (Water Soluble Fertilizers) has significantly increased the clean Coffee yield (25-30%), as compared to sprinkler irrigation on account of higher fertilizer use efficiency of 2.72 Kg clean yield of per Kg N_2, P_2O_5, K_2O fertilisers.
- Experiments were initiated to study the effect of proprietary formulation viz., Mahalaabh (Potassium Schoenite) on Coffee. The result of the field trials indicated higher yield in both Arabica (1,008 Kg/ha) and Robusta (1,759 Kg/ha) in the treatment receiving the application of 50% Mahalaabh and 50% of Muriate of Potash (N).
- Under the soil, leaf, agrochemical analysis and advisory service, a total of 8,787 soil samples (3,023 beneficiary), 33 leaf samples (4 growers) and 638 agrochemical samples received from 415 Coffee growers were analyzed and reports were communicated to the growers. The soil tests include 4,334 soil samples received from 46 on-spot mobile soil testing campaigns organized at different locations.
- Studies on the influence of 'Calcicare' on Arabica and Robusta Coffee indicated, that the Calcicare treated plants with alpha Naphthalene Acetic Acid in Robusta and Calcicare with Drought Ameliorative Spray in Arabica recorded higher yield of 1,298 Kg/ha and 677 Kg/ha, respectively.
- Foliar spray of micronutrients and growth hormone on induction of flower buds and yield of Robusta Coffee (*cv.,* CxR) resulted in significant improvement of cropping nodes compared to control. The fruit yield has increased from 1,235 Kg/ha (2019-20) to 2,318 Kg/ha (2021-22) in the sprayed plot.
- The graft combinations such as S.4595/CxR, S.4595/S.274, Sln.5B/CxR, Sln.9/CxR and Sln.5B/S.274 are performing better under the field conditions in terms of physiological and gas exchange parameters.
- The White Stem Borer tolerant Arabica cultivar S.4595, with check variety Sln.9 was evaluated for gas exchange parameters during moisture stress conditions. The result indicated that S.4595 has performed well and maintained better gas exchange parameters when compared to the check variety Sln.9 in all the moisture stress conditions. These results indicated that S.4595 is better suited to drought-prone areas.
- Thirty-nine designated rust races (I, II, III, IV, VI, VII, VIII, X, XI, XII, XIII, XIV, XV, XVI, XVII, XIX, XX, XXI, XXII, XXIII, XXIV, XXV, XXVI, XXVII, XXVIII, XIX, XXX, XXXI, XXXII, XXXIII, XXXIV, XXXV, XXXVI, XXXVII, XXXVIII, XXXIX, XL, XLI and XLII) were maintained in Arabica cultivars *viz.,* Bourbon and Mattari. Further, all the 39 rust races were stored in gelatin capsules and preserved at 4°C.

- The results of the field evaluation of new fungicide molecules (Azoxystrobin 18.2% + Difenoconazole 11.4% SC; Propiconazole 13.9% + Difenoconazole 13.9% EC; Picoxystrobin 6.78% + Tricyclazole 20.33% SC & Picoxystrobin 7.05% + Propiconazole 11.71% SC) for the management of Coffee leaf rust (CLR) disease indicated that the efficacy of the standard fungicide molecule *viz.,* Hexaconazole 5EC (2 ml/L) was found to be superior as compared to new fungicide molecules tested.
- The results of combined spraying of fungicide (Hexaconazole 5% EC for the management of Coffee leaf rust), insecticide (Chlorpyriphos 50% + Cypermethrin 5% EC for the management of Coffee White Stem Borer), and nutrients (macro & micronutrients for berry development & bean maturation) during pre and post-monsoon periods indicated that plants sprayed with Hexaconazole 5% EC (2 ml/L) showed minimum rust disease incidence (0.64%) followed by 2.22% of rust disease incidence in Hexaconazole 5 EC (2 ml/L) + nutrient treatment (19:19:19 at the rate of 5 gm/L). Maximum rust disease incidence was recorded in untreated control plants (11.9%). Further, the addition of insecticide and nutrients in the spray mixture did not alter the efficacy of the fungicide.
- The results of the screening of new fungicide molecules for the management of black rot disease incidence in Coffee plantations (in comparison with the recommended fungicide *viz.*, 1% Bordeaux mixture) revealed that the Coffee blocks sprayed with Pyraclostrobin 13.3% + Epoxyconazole 5% SE (1 ml/L) have registered least infestation level (3.84%) when compared to 1% Bordeaux mixture spray (9.52%). Maximum black rot infestation level was seen in the unsprayed control plot (48.33%).
- Field evaluation of various fungicide molecules (Carbendazim 50 WP; Propiconazole 25 EC, Tebuconazole 25 EC, Trifloxystrobin 25% WG + Tebuconazole 50% WG & 1% Bordeaux mixture) for the management of Coffee stalk rot disease in Coffee plantation indicated that least stalk rot disease incidence (1.2%) was recorded in plants treated with Trifloxystrobin 25% WG + Tebuconazole 50% WG (1 gm/L) followed by 1.9% of disease incidence with Tebuconazole 25 EC (1 ml/L), 3.8% of disease incidence with Propiconazole 25 EC (1 ml/L) and 6.12% of disease incidence with both Carbendazim 50 WP (1 gm/L) & 1% Bordeaux mixture. Untreated control plants have recorded the highest stalk rot disease incidence (14.25%).
- A total of 130 Kg of *Trichoderma harzianum* starter culture was supplied to three Coffee growers for the management of root disease in Coffee.

- The results of the random survey conducted in different Coffee liaison zones of Chikkamagaluru, Hassan & Kodagu districts in Karnataka state indicated that the extended rainfall received till December 2021 and unusual weather parameters did not have any influence on the emergence pattern of Coffee White Stem Borer (CWSB) pest during the winter flight period of 2021 (October to December 2021).
- Towards identifying alternate insecticides to Chlorpyrifos 50 EC + Cypermethrin 5 EC (1.2 ml/L) for the management of CWSB, various insecticides were screened for ovipositional deterrence and ovicidal action. The results indicated that Phenthoate 50 EC at the rate of 2 ml/L was found to be very effective with respect to both ovipositional deterrence and ovicidal action. Therefore, Phenthoate 50 EC at the rate of 2 ml/L can be recommended, as an alternate insecticide to Chlorpyrifos 20 EC.
- The Bio-Nano Formulation (BNF) supplied by Tamil Nadu Agriculture University (TNAU), Coimbatore was evaluated under laboratory conditions for the management of CWSB and Coffee berry borer (CBB) pests. The observations indicated that in the case of CWSB, BNF did not show any ovicidal and larvicidal action at all the concentrations tested in the evaluation trial (100, 200, 300, 2,500, 5,000 & 10,000 ppm). However, BNF exhibited 70% of ovipositional deterrence activity at the highest concentration tested in the evaluation trial (i.e., 10,000 ppm). Further, the application of BNF at the rate of 5,000 ppm exhibited a reduction in CBB infestation or avoidance of CBB beetle to the tune of 80%.
- Another bio-formulation *viz*., "Pesto Borer Care" is supplied by M/s. Pestomatic Controls, Ahmed Nagar, Maharashtra was also evaluated at various concentrations (1:1, 1:5, 1:10, 1:15 & 1:20) for the management of CWSB, CBB and shot hole borer (SHB) pests under laboratory conditions. The observation revealed that in the case of CWSB, no ovipositional deterrence, ovicidal and larvicidal activities were observed at all concentrations tested. Similarly, the application of "Pesto Borer Care" showed no mortality of CBB and SHB pests at all concentrations tested.
- Among the various lures tested for the trapping of shot hole borer (SHB) pest, 50% absolute ethanol has attracted the maximum number of SHB adult beetles.
- Field evaluation of various bio-control agents *viz*., *Trichoderma harzianum*, *Beauveria bassiana, Verticillium lecanii, Metarhizium anisopliae, Bacillus subtilis* and *Bacillus cereus* for the management of SHB pest indicated that *Beauveria bassiana has* caused significant mortality of SHB adult beetle (82.5%) followed by *Trichoderma harzianum* (76%) and *Metarhizium anisopliae* (75%).
- Various insecticides (Chlorpyrifos 50 EC + Cypermethrin 5 EC, Chlorpyrifos

20 EC & Lambda-Cyhalothrin 5 EC) and fungicides (Hexaconazole 75 WG, Tebuconazole 25.9 EC & Propiconazole 25 EC) were evaluated either as stand-alone or in a combination of insecticides and fungicides for the management of SHB pests. The result indicated 100% SHB pest mortality in plants sprayed with insecticide alone and the cocktail spray of insecticide and fungicide. Further, plants sprayed with fungicide alone did not cause significant mortality of SHB pest.

- Laboratory evaluation of various bio-agents *viz*., *Beauveria bassiana, Metarhizium anisopliae, Bacillus subtilis, Pseudomonas fluorescens*, *Paecilomyces lilacinus*, *Trichoderma viridae,* and *Steinernema carpocapsae* for the management of root grubs in Coffee plantation indicated that application of *Beauveria bassiana*, *Tricoderma viridae* and *Paecilomyces lilacinus* have showed the highest larval mortality of the root grub.
- A total of 355 cross-vane pheromone traps with lure was supplied to a total of seven planters in Karnataka for monitoring and management of the CWSB pest during the 2021-2022 season.
- A total of 32,635 Broca traps with lure and 1032.75 litres of Broca lure alone were supplied to a total of 321 growers in Karnataka and Kerala states, for the management of Coffee berry borer. Further, 303 Kg of *Beauveria bassiana* (a fungal biocontrol agent) was supplied to 13 growers in Karnataka and Tamil Nadu states for the management of Coffee berry borer.
- To manage the mealy bug pest infestation, 1,68,150 numbers of parasitoids (*Leptomastix dactylopii)* were supplied to sixty growers in Karnataka and Kerala state.
- Cup quality analysis of Arabica and Robusta Coffee samples subjected to different drying techniques (sun drying versus mechanical Coffee dryer) indicated that there are no significant differences in the cup quality scores of Arabica and Robusta cherry samples dried in the sun and rotary mechanical dryer.
- Twelve bacterial and twenty-seven *Yeast* strains were isolated from Arabica ripe Coffee fruits. These strains were screened for pectinase and cellulolytic activities under laboratory conditions. Microbial strains with superior pectinase and cellulolytic activities were identified. These microbial strains will be employed in Coffee fermentation trials and Coffee effluent treatment processes to assess their potential in improving Coffee quality and Coffee effluent treatment processes.
- Biochemical analysis of Coffee bean samples obtained from four tree Coffee species (*Coffea liberica, Coffea excelsa, Coffea abeokutae* and *Coffea arnoldiana*) indicated that the lowest caffeine content (0.295%) and highest chlorogenic acid content (6.95%) were recorded in *Coffea liberica*, as compared to other tree Coffee species.

- Fourteen Coffee effluent samples received from three corporate Coffee estates were analyzed for various pollution parameters (pH and biological oxygen demand levels). The analysis reports along with the advisory notes were communicated to the concerned estate authorities.
- A total of 875 Coffee samples received from eighty-three stakeholders were assessed for physical and cup quality parameters during the year under-reporting. The quality evaluation reports were sent to the concerned stakeholders.
- A total of 128 moisture meters received from forty-seven stakeholders were calibrated at the Analytical Laboratory, Bengaluru, and issued calibration reports to the concerned. Further, thirty commercial Coffee samples received from twenty stakeholders were tested for various phytosanitary and nutritional parameters, and the analysis reports were issued to the concerned stakeholders.
- Four "Kaapi Shastra" training programmes on "Roasting-Brewing-Packaging-Coffee Retailing" were conducted in Bengaluru covering ninety participants. Further, a Three-Day training Programme on "Coffee Entrepreneurship Development on Value Addition and Marketing of Coffee" was organized from 22nd to 24th August 2021 in New Delhi benefitting 14 participants.
- Under the "Support to Value Addition/ Support for R & G Units" Programme, subsidy was extended to nineteen Coffee roasting units during the period under report.
- Fifteen students of the 2019-2020 batch of the PG Diploma in Coffee Quality Management System have successfully completed the course during 2021-22. Twelve students who joined during 2020-2021 batch have completed 1st & 2nd trimesters and currently undergoing the 3rd trimester at Coffee Quality Evaluation Division in Bengaluru. Thirteen students who joined in 2021-2022 academic year are presently attending the 1st trimester at Central Coffee Research Institute, Chikkamagaluru, Karnataka.
- With an objective of protecting and promoting the unique Regional and Specialty Coffees of India, the Coffee Board has obtained Geographical Indication (GI) registration for seven different Coffees. Further, the Coffee Board is extending the facility of Authorized User Registration (AUR) of these GI-tagged Coffees by various stakeholders in the Coffee value chain. In this direction, sixteen AUR certificates were issued (eight certificates for planters and eight certificates for the Research Farms & Technology Evaluation Centres of the Coffee Board) during the period under report. In addition, four applications received from the stakeholders were submitted to GI Registry, Chennai for further processing.
- **Webinars and Capacity Building Programmes**: The Research Department

of the Coffee Board has organized fifteen webinars during the period 2021-2022 and 1,112 stakeholders were participated in webinars. Further, four training Programmes on "**Coffee Production and On-Farm Processing of Coffee**" was conducted covering 101 stakeholders.

Extension and Development

A. Traditional Areas

- Extension personnel carried out 1,207 field demonstrations, issued 1,052 advisories through print / electronic / social media to educate the growers on various aspects of coffee cultivation, conducted 150 village level meetings, 62 training programmes on coffee cultivations, 15 Exposure visits, 14 vocational training programmes and 7 Seminars.
- During the period under report, the extension units cleared 19 applications pertaining to replantation benefitting 23.78 Ha, 280 applications pertaining to 299 water augmentation units benefitting 807.44 Ha.

B. Non Traditional Areas (Andhra Pradesh & Odisha)

- Extension personnel carried out 691 Method demonstrations, 97 exposure visits, 145 group gatherings and 60 village level meetings for the benefits of tribal coffee growers and 30 Capacity Building Programmes.
- Support was extended to construct 157 cement drying yards and for the purchase of 320 baby pulper units with an objective of improving coffee quality.

C. North Eastern Region

- Extension personnel carried out 2,104 Field demonstrations, 264 group meetings, 59 on-farm trainings and 34 quality awareness campaigns to educate the coffee growers on various aspects of coffee cultivation.
- Support was extended to 79.80 Ha. of coffee expansion/ consolidation, construction of 20 drying yards and 25 group nurseries.

Capacity building Programmes

- 15 students were graduated from the Post Graduate Diploma course offered by Coffee Quality division of the Coffee Board.
- Four Kaapi Shastra Training Programmes were conducted at Coffee Quality Division, and a total of 90 participants have attended the programmes.

Market Research & Intelligence

- Economic and analytical support was rendered on WTO and trade policy matters pertaining to Coffee. During the year 2021-2022, a total of 183 daily market reports were generated and disseminated.
- The Unit has published two issues of comprehensive 'Database on Coffee' for the months of July 2021 and January 2022. 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 2021-2022.
- The Unit has provided the requisite inputs with reference to coffee to Karnataka State Agricultural Produce Processing and Export Corporation Limited (KAPPEC), the State nodal agency for the implementation of One District One Product (ODOP) scheme.
- The Unit has involved in organizing two 'VIKRAYAM' incubation Programme during October to November 2021 and February to March 2022 to create a platform for the Coffee growers and entrepreneurs for the direct exports without many intermediaries.

Promotion

- The Coffee Board has undertaken 10 Virtual Buyer Seller Meeting/ Business Network Meeting/ India Coffee tasting session with active involvement of the Indian Coffee exporters and some of the Indian Embassies.
- During the year, the Coffee Board has participated in 11 Food & Beverage / Agri Expos (both Physical & Virtual together) in the country for promotion of domestic coffee consumption.

Administration

- During the year 2021-22, three Board Meetings were conducted on 27th July 2021, 30th November 2021 and 3rd March 2022.
- During the year a total of 83 officers/ officials were granted financial upgradation under the Modified Assured Career Progression Scheme (MACPS).
- During the year, a total of 71 officers / officials were promoted in different 'Scientific' 'Technical' and 'Ministerial' cadre posts.
- The Staff Strength of the Coffee Board as on 31.03.2022 was 548 employees comprising of 65 Group 'A' officers 127 Group 'B' Officers and 356 Group 'C' officials.

Vigilance & Legal

- Vigilance Division conducted Vigilance Awareness Week from 26th October 2021 to 1st November 2021.
- Out of 60 court cases, 07 cases were disposed and 53 court cases are pending.

Right to Information

- Under RTI, 43 applications were disposed out of 45 applications received.
- During the year, out of 3 appeals under RTI, 2 appeals have been disposed leaving behind one appeal pending.

Engineering Unit

- The Engineering Unit has taken up maintenance works of Coffee Board's buildings under Creation of Asset & Swachh Bharath and a sum of ₹2,36,85,390/- has been incurred towards

maintenance works during the financial year 2021-22.

Official Language Implementation

- The Official Language Wing adhered to the targets fixed in the Annual programme 2021-22 issued by the Department of Official Language, Ministry of Home Affairs, Government of India.
- The documents under Section 3(3) of the Official Languages Act 1963 were issued in bilingual form and Rule 5 of the Official Language Rules, 1976 has been complied with. The target set for 'C' region for original correspondence and notings have been achieved.
- The Quarterly Progress Report regarding progressive usage of Hindi and Half Yearly report were submitted to the Department of Official Language, Ministry of Home Affairs, New Delhi, with a copy forwarding to the Ministry of Commerce & Industry, New Delhi and Town Official Language Implementation Committee (O-2), Bengaluru in due course.
- Translation of 81st Annual Report/Audit Report & Annual Accounts 2020-21 of Coffee Board, correspondence related to Right to Information Act and Agenda & Notes/Minutes of the meetings of various committees of the Board have been completed in time.
- A total of four Hindi workshops for the officers/employees were organized in each quarter.
- The meetings of the Official Language Implementation Committee were held in each quarter.
- Inspection of various Sections/Units at Head Office and Inspection/Workshop of two Sub-Offices were conducted during the year under report.
- Incentive scheme implemented for officers/employees for doing original work in Hindi has been continued during the year under report. Further, in view of increasing notings in Hindi and to fulfil the target fixed in the Annual Programme, a new Scheme for writing notings on note files is introduced for the Financial Year 2022-23.
- Hindi fortnight has been observed from 01.09.2021 to 14.09.2021 during which various competitions were organized for the officers/employees of the Board and the winners of the competitions were awarded during Hindi Diwas Celebrations on 14.09.2021. The fifth issue of Annual Hindi In-House Magazine "Ankur" has been digitally released on the occasion. Hindi Diwas has been celebrated in four sub-offices of the Board also.
- A special Lecture on "Health Problems and Solutions" has been organized during October 2021.
- An essay writing competition in Kannada, Hindi and English languages has been organized for the children of officers/ employees of Coffee Board in observation of Vigilance Awareness Week-2021 i.e., from 26th October to 1st November 2021.

- Three officers/employees of Head Office have been nominated for Hindi Prabodh Online Course (January-May 2022 session) of Hindi Teaching Scheme under Central Hindi Training Institute, Koramangala, Bengaluru.
- Three officers of Official Language Wing participated in 'One Day Regional Official Language Conference and Prize Distribution Ceremony' held at Hyderabad on 04.12.2021.
- Three officers of the Official Language Wing participated in the "Bhartendu Rajbhasha Koushal Abhimukhikaran Kaaryakram - 1" organized by BEL Corporate on 08.02.2022 through online under the aegis of Town Official Language Implementation Committee (Office-2), Bengaluru.
- Deputy Director (OL) i/c and the three officers of Official Language Wing have been attended both the half yearly meetings of Town Official Language Implementation Committee (Office-2), Bengaluru held on 07.10.2021 and 11.01.2022 respectively.
- "Hindi Oral Quiz" - Inter - official competition has been organized by the Official Language Wing on 01.12.2021 on the occasion of Joint Hindi Day being celebrated by the Town Official Language Implementation Committee (Office-2), Bengaluru.

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CHAPTER - II

CONSTITUTION AND FUNCTIONS OF THE BOARD

Coffee Board is a statutory organization under the Ministry of Commerce and Industry, Government 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 was reconstituted for a period of three years from 8th March, 2019 with 20 members. Department of Commerce, Ministry of Commerce &Industry vide Gazette notification dated 08.03.2019, appointed ten Members to the Board viz., Chairman, Secretary, (as an Ex-Officio member), two Members of Parliament (Lok Sabha), one Member of Parliament (Rajya Sabha), three members representing Governments of the principal Coffee growing states (Tamil Nadu, Karnataka and Kerala); two members representing the interests of other Coffee growing states of Tripura and Assam. Further, the Department of Commerce, vide Gazette notification dated 22.05.2019, appointed nine members viz., two representing large Coffee growers, two representing small Coffee growers, two representing labour interest, two representing consumers' interest and one representing eminent scientist from Research Institute or an Agricultural University. Subsequently, on expiry of 16th Lok Sabha tenure, the Department of Commerce, vide Gazette notification dated 19.09.2019 re-appointed Members of Parliament (Lok Sabha) and one Member of Parliament (Rajya Sabha). Further, one Member representing Large Coffee growers was appointed vide Department of Commerce Gazette notification dated 03.12.2019.

LIST OF COFFEE BOARD MEMBERS FOR THE YEAR 2021-22

(from 08th March 2019 to 07th March 2022)

Sl. No.	Category	Appointed under Coffee (Amendment) Rules, 2016	No. of Members	Name
1	Chairman	Rule 3 (1)	1	Shri. M.S. Boje Gowda
2	Members of Parliament (LS) Member of Parliament (RS)	Rule 3 (1) Rule 3 (1)	2 1	(1) Shri V. Srinivas Prasad (2) Shri Prathap Simha (3) Shri A. Vijayakumar
3	Members representing Governments of Principal Coffee growing States	Rule 3 (2) (a)	4	(1) Shri C. Samayamoorthy, IAS, Agricultural Production Commissioner & Secretary to the Govt., Govt. of Tamil Nadu (2) Shri Rajender Kumar Kataria, IAS, Secretary to Government, Horticulture and Sericulture Dept., Govt. of Karnataka, (3) Ms.Ishita Roy, IAS, Principal Secretary and Agriculture Production Commissioner, Govt. of Kerala (4) - Vacant .
4	Representatives of large Coffee growers	Rule 3 (2) (b)	3	(1) Shri T.T. John (2) Shri Jampana Sri Rama Raju (3) Shri Shaker Nagarajan

Sl. No.	Category	Appointed under Coffee (Amendment) Rules, 2016	No. of Members	Name
5	Representatives of Small Coffee growers	Rule 3 (2)(b)	7	(1) Dr. G.S. Mahabala (2) Shri Machamada Dally Chengappa (3) - Vacant - (4) - Vacant - (5) - Vacant - (6) - Vacant - (7) - Vacant -
6	Representatives of Coffee Trade Interest	Rule 3(2)(c)	3	(1) - Vacant - (2) - Vacant - (3) - Vacant -
7	Representatives of Curing Establishment Interest	Rule 3(2)(c)	2	(1) - Vacant - (2) - Vacant -
8	Representatives of Labour Interest	Rule 3(2)(c)	3	(1) Shri Mundhe Dnyanoba Sitaram (2) Shri Shashikant Soni (3) - Vacant -
9	Ex-Officio Member	Rule 3(2)(c)	1	(1) Dr. K.G. Jagadeesha, IAS, CEO & Secretary, Coffee Board, Bengaluru

Sl. No.	Category	Appointed under Coffee (Amendment) Rules, 2016	No. of Members	Name
10	Members representing Coffee Growing States other than Principal Coffee Growing States	Rule 3(2)(c)	2	(1) Dr. Parshanth Kumar Goyal, IAS, Special Secretary to Chief Minister, Dept. of Industries & Commerce, Govt. of Tripura, Agartala. (2) Dr. K.K. Dwivedi, IAS Secretary to Govt. of Assam Industries & Commerce Dept., Government of Assam
11	Representing Consumers Interests	Rule 3(2)(c)	2	(1) Shri Narendra V. Vaishampayan (2) Shri Kotla Jayanthu 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 Board:

The main functions assigned to the 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, Coffee 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.

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.

Standing Committees:

The Board may appoint every year the following standing committees:

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, Standing Committees held during the period from 01.04.2021 to 31.03.2022.

Board Meetings	209th Board Meeting held on 27th July 2021 210th Board Meeting held on 30th November 2021 211th Board Meeting held on 3rd March 2022
Standing Committees	162nd Research Committee Meeting held on 01.04.2021 99th Coffee Quality Committee Meeting held on 09.04.2021 166th Propaganda Committee Meeting held on 09.04.2021 96th Development Committee Meeting held on 15.09.2021 100th Coffee Quality Committee Meeting held on 26.10.2021 167th Propaganda Committee Meeting held on 14.02.2022

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CHAPTER - III

ADMINISTRATION AND ESTABLISHMENT

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

Dr. K.G. Jagadeesha, IAS

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 - up to 31.10.2021
3. Dr. Tasveem Ahmed Shoeeb, Director of Research - from 01.11.2021 to 31.03.2022

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 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 benefit 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 Coffee Board is responsible for allocation / administration of funds of Coffee Board, maintenance of accounts and all matters relating to managing finances of Coffee 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, action has been initiated to fill up the post of Director of Research by direct recruitment through open competition.

(b) Promotions

During the year, a total of 71 officers / officials were promoted in different 'Scientific' 'Technical' and 'Ministerial' cadre posts.

(c) Modified Assured Career Progression Scheme (MACPS)

During the year, a total of 83 officers / officials were granted financial upgradation under the Modified Assured Career Progression Scheme (MACPS).

(d) Transfer and Postings

A total of 128 employees were transferred during the year 2021-22. The details are as under:

Sl. No.	Cadre / Grade	No. of Officers / Officials transferred
1.	Group 'A'	19
2.	Group 'B'	46
3.	Group 'C'	63
Total		**128**

Employee's Welfare Measures (01-04-2021 to 31-03-2022)

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 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, 2022, the scheme had 454 members on the roll comprising of different categories. An amount of ₹22,13,486/- was settled to 36 members during the financial year 2021-22.

Staff Strength of Coffee Board as on 31.03.2022

The details of group wise staff strength, number of Scheduled Caste and Scheduled Tribe employees and particulars of female staff strength of Coffee Board as on 31.03.2022 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'	65	6	5	9.23	7.69	10	15.38
(2)	Group 'B'	127	21	7	16.54	5.51	42	33.07
(3)	Group 'C'	356	63	24	17.70	6.74	79	22.19
Total		**548**	**90**	**36**	**16.42**	**6.57**	**131**	**23.91**

Official Language Wing

- The Official Language Wing adhered to the targets fixed for Region 'C' in the Annual Programme 2021-22 issued by the Department of Official Language, Ministry of Home Affairs, Government of India, New Delhi.
- A total of 14,431 documents issued in bilingual form under section 3 (3) of Official Languages Act 1963 during the period under report. The prescribed target of 55% for original correspondence and 30% for notings for 'C' region has been achieved.
- The Hindi version of 81st Annual Report/ Audit Report & Annual Accounts 2020-21, Right to information correspondence, Agenda/Notes, Minutes of the various committee meetings (209th, 210th, 211th Board Meetings; 166th, 167th Propaganda Committee Meetings; 99th, 100th Coffee Quality Committee Meetings; 162nd Research Committee Meeting and 96th Development Committee Meeting), Market Watch editions (January 2021 to August 2021) for Indian Coffee Magazine have been prepared and completed in the stipulated time.
- A total of four Hindi workshops were organized for the officers/employees during each quarter and a total of 35 officers/officials were made aware of Official Language Policies, Rules & Regulations, Preparation of Quarterly Progress Report, Hindi Typewriting, Hindi Software Tools etc. by inviting experts in the specialised fields to deliver lectures on these topics and necessary guidelines were given for effective implementation of Official Language. Similarly, Hindi Workshops were also conducted in sub-offices of the Board *viz.,* Central Coffee Research Institute (CCRI), Chikkamagaluru and Coffee Research Sub Station (CRSS), Chettalli. Inspection regarding implementation of Official Language, workshops and meetings of Official Languages implementation committee were conducted at the O/o Joint Director(Extn.)/Deputy Director (Extn.), Hassan and at Tissue Culture & Biotechnology Centre, Mysuru on 07.03.2022 and 14.03.2022 respectively.
- The meetings of Official Language Implementation Committee were conducted in each quarter regularly. The consolidated quarterly progress report regarding progressive usage of Hindi and Half Yearly report were submitted to the Department of Official Language, Ministry of Home Affairs, New Delhi, with a copy to the Regional Implementation Office, Bengaluru; Ministry of Commerce & Industry, New Delhi and Town Official Language Implementation Committee (Office-2), Bengaluru.
- The incentive scheme for doing original work in Hindi was continued during the year. As per the scheme, an officer/ employee is eligible for a cash award of ₹5,000/- per annum on writing 5,000 words in Hindi on note files/ Registers and typing on computer. Further, with a

view to increase notings in Hindi and to fulfil the target of 30% notings fixed in the Annual Programme 2021-22, a new scheme for writing notings on notefile was introduced for the FY 2022-23.

- Hindi Fortnight was observed from 01.09.2021 to 14.09.2021 and various competitions in Hindi were held during the fortnight for the officers/officials of Head Office and Hindi Diwas was celebrated on 14.09.2021. Dr. Koyal Biswas, Assistant Professor & Head, Hindi Department, Mount Carmel College, Bengaluru, graced the occasion and distributed prizes for the winners of the various competitions. The 5th edition of Annual Hindi In-House Magazine "ANKUR" was digitally released.
- A special lecture on "Health problems and solutions" was organized on 25.10.2021 by inviting two senior doctors from Ramaiah Indic Super-Specialty Ayurveda-Restoration Hospital, Bengaluru, in two sessions *viz.,* "Role of Ayurveda in our lives" and "Psychological aspects of COVID-19".
- The Vigilance Awareness Week, 2021 (26th October to 1st November 2021) was observed in Coffee Board with the theme "Independent India @ 75: Self-Reliance with Integrity". In this context, an essay writing competition on "ಪ್ರಾಮಾಣಿಕತೆಯೊಂದಿಗೆ ಸ್ವಾವಲಂಬನೆ / सत्यनिष्ठा से आत्म निर्भरता / Self reliance with integrity" was conducted in three languages i.e., Kannada, Hindi and English for the children of officers/ employees of Coffee Board. The winners were awarded with cash prizes.
- Three officers of Official Language Wing participated in 'One Day Regional Official Language Conference and Prize Distribution Ceremony' organized at Dr. Homi Bhabha Convention Center Auditorium, Hyderabad on 04.12.2021.
- The officers of Official Language Wing participated in "Bharthendu Rajbhasha Koushal Abhimukhikaran Kaaryakram – 1" organized/sponsored by BEL Corporate office through online on 08.02.2022 under the aegis of Town Official Language Implementation Committee (Office-2), Bengaluru.
- Three officers/officials of the Head Office were nominated for Hindi Prabodh online course for the session January-May 2022 under Hindi Teaching Scheme organized by Central Hindi Training Institute, Koramangala, Bengaluru.
- The Joint Director (E/Admin(i/c)), Coffee Board and the officers of Official Language Wing attended both the half yearly online meetings of Town Official Language Implementation Committee (Office-2) on 07.10.2021 and 11.01.2022 respectively.
- An inter-organization "Hindi oral quiz" competition was organized on 01.12.2021 at Coffee Board under the auspices of Town Official Language Implementation Committee (Office-2), Bengaluru, on the occasion of Joint Hindi Day Celebrations 2021. A total of 38 participants from

various member offices participated in the competition. Similarly, the officers/officials of Coffee Board actively participated in various competitions organized by other member offices.

- During the year, inspections regarding implementation of Official Language, Hindi workshops and meetings of Official Language Implementation Committee were held at the O/o Joint Director (Extn.)/ Deputy Director (Extn.), Hassan and Tissue Culture & Biotechnology Centre, Mysuru on 07.03.2022 and 14.03.2022 respectively.

Vigilance Unit

The vigilance unit is responsible for carrying out the following activities

1. Receiving complaints and taking action thereof.
2. Verification of character and antecedents of persons recruited to the Coffee Board's service, preparation and submission of periodical returns to the Ministry of Commerce & Industry.
3. Issuance of Vigilance clearance in respect of officers / officials of Coffee Board for various purposes.
4. Processing of applications seeking permission for acquiring movable and immovable properties of officers / officials of 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. Further, the Vigilance Awareness Week was conducted from 26th October 2021 to 1st November 2021.

Details of Vigilance Cases

1.	Pending disciplinary cases as on 01.04.2021	Nil
2.	Disciplinary cases added during the year 01.04.2021 to 31.03.2022	Nil
3.	Disciplinary cases concluded during the year 01.04.2021 to 31.03.2022	Nil
4.	Disciplinary cases pending as on 31.03.2022	Nil

Legal Unit

The Legal cell is responsible for carrying out the following functions

- Attending to all the Board's Legal matters pertaining to Service matters, Marketing, Taxation, Intellectual Property Rights (IPR), Plantation Labour, etc.
- Attending litigations pending before various courts of Law *viz.,* Supreme Court, High Courts, Labour Courts, Lower Courts, IPR Tribunal and Sales Tax Appellate Forum etc., of respective States.
- Co-ordination and assisting Coffee Board's Advocates with relevant records to enable them to prepare plaints/counter and for arguments.
- Attending to correspondences connected with Amendment to Coffee Act and correspondence with the Ministry of

Commerce and Industry, Government of India relating to the said matter.

- Furnishing opinion on files being referred by various sections *viz.,* Export, Pension, Engineering, Administration, etc.

Status of Court cases

52 cases were pending at the beginning of the year. During the year, 08 new cases were registered. Out of the total 60 cases, 07 cases were disposed and 53 cases are pending as on 31.03.2022.

Status of Tax Disputes

a) Government of Kerala

The High Court of Kerala vide order dated 29/8/2008 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 26/9/2012 remanded the matter to the assessing officer. Coffee 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. Coffee Board filed first appeal and 2nd appeal 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. As per the judgement, the Assessing authority, State Tax Officer, Kerala GST Department, Chavakkad, has issued notice for production of records. Accordingly, Coffee Board submitted further records to substantiate claims in addition to the records which were submitted at the time of original assessments. The Assessing Authority refused to accept them on the grounds that production of transport receipts/invoices/ bill of lading etc., only be considered as per the Tribunal directions and passed orders for payment of ₹241,66,24,328.00. Coffee Board after consultation with Tax experts and Coffee Board`s Advocate who appeared in the High Court has prepared and filed Appeals before the Joint Commissioner (Appeals), Kerala Tax Department, Thrissur and also filed Stay order applications.

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 & Arakuvalley (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 are maintained by the Extension Department in the states of Karnataka, Kerala, Tamil Nadu, Andhra Pradesh, Odisha, Assam, Arunachal Pradesh, Tripura & 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 maintenance works of Coffee Board's buildings under Creation of Asset & Swachh Bharath and a sum of ₹2,36,85,390/- has been incurred towards maintenance works during the financial year 2021-22.

RTI & Grievances Unit

Right to Information

Under Right to Information Act-2005, Coffee Board has received 42 applications from the Citizens of India seeking information/ documents during the year 2021-22 with three carried forward applications from the previous year. During the year 2021-22, 43 applications were disposed with two carried forward applications for disposal within the stipulated time during the next year. Two appeals received under RTI with one carried forward appeal from the previous year. During the year two appeals were disposed and one appeal carried forward for disposal within the stipulated time during the next year. During the year 2021-22, Coffee Board received six grievances and all the grievances have been disposed.

Details of applications under RTI for the year 2021-22

Sl. No.	Particulars	Status
1.	Opening balance	03
2.	Receipts during the year	42
3.	Total	45
4.	Disposal during the year	43
5.	Closing balance	02

Details of Appeals under RTI for the year 2021-22

Sl. No.	Particulars	Status
1.	Opening balance	01
2.	Receipts during the year	02
3.	Total	03
4.	Disposal during the year	02
5.	Closing balance	01

Details of Grievances for the year 2021-22

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

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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 31.03.2022. 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	12	1	8.33	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	79	2	2.53	2	--	--
6.	Senior Assistant	C	43	1	2.33	1	--	--
7.	Junior Assistant	C	20	6	30.00	6	--	--
8.	Multi-Tasking Staff	C	182	1	0.55	1	--	--
		Total:	**373**	**16**	**4.29**	**16**	**--**	**--**

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CHAPTER – IV

COFFEE RESEARCH

The Coffee Board Research Department has implemented a number of research projects during the year 2021-22 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 (Alluri Sitharama Raju District, Andhra Pradesh) and Diphu (Karbi Anglong District, Assam) and also the Plant Tissue Culture and Biotechnology Centre, Mysuru and Coffee Quality Evaluation Centre, Bengaluru.

The salient findings under different research projects and other activities implemented during the year 2021-2022 are as detailed below:

CROP IMPROVEMENT

Division of Plant Breeding and Genetics

Major focus of Arabica improvement programme was on breeding for durable resistance to Coffee leaf rust (CLR) as well as Coffee white stem borer (CWSB), multi-location evaluation of promising genotypes through extended field trials and multiplication of promising genotypes through tissue culture under Public-Private Partnership. In Robusta, major focus was on the identification of elite plants through conducting survey across the Robusta tracts in collaboration with Growers' Associations and evaluation new Robusta varieties introduced from Nestle R & D, France.

Towards breeding for durable rust resistance in semi-dwarf cultivars using gene pyramiding approach, several F_1 hybrids were developed from the crosses effected between popular semi-dwarf genotype like Chandragiri, HDT Catuai, S.5149, S.4889 and Sln.10 (donor for S_H3 gene) since 2011. The hybrids were established at CCRI and Regional Stations. Among the hybrids, S.5059 has recorded maximum projected yield of 1,028 Kg/ha with mean yield of 1,018 Kg/ha and highest field tolerance to Coffee leaf rust (12% population manifested mild susceptibility) and high percentage of 'A' grade beans (69%).

With an objective of transferring S_H3 gene (introgressed from diploid species, *C. liberica*) into Chandragiri, reciprocal crosses were made between Chandragiri (S.4202) and Sln.10 (donor for S_H3 gene) and four semi-dwarf F_1 progenies (S.5083 to S.5086) were developed and established. Among the hybrid progenies, S.5086 has recorded the maximum projected yield of 1,322 Kg/ha followed by S.5085 (1,185 Kg/ha). S.5085 has recorded maximum 'A' grade beans (70%) followed by

S.5086 (69%). Both, genotypes (S.5085 and S.5086) have remained free from the Coffee leaf rust incidence during the peak month of October. Similar crosses were effected at RCRS Thandigudi and eleven F_1 hybrid progenies were generated (S.5309-S.5319) by crossing S.3822 (Sarchimor) and Sln.10. Among the progenies, S.5319 and S.5318 have exhibited consistency in yield and field tolerance to Coffee leaf rust (CLR). S.5319 and S.5318 have recorded the highest yield of 1,580 Kg/ha and 1,432 Kg/ha respectively and field tolerance to CLR (0 to 20% of population with mild susceptibility).

Among the hybrids generated by crossing Cavimor (S.5149) with Sln.10, two F_1 hybrids (S.5168 & S.5171) manifested high field tolerance to incidence of Coffee leaf rust during the peak period with a higher average yield of 930 Kg/ha for four years.

Monitoring of four hybrid progenies (S.5117 to S.5120) evolved by crossing S.4889 and S.4890 with Sln.10, revealed that, S.5119 is found superior with the highest yield of 874 Kg/ha and high field tolerance to Coffee leaf rust (5.66% of the population exhibited mild susceptibility) followed by S.5118 (823 Kg/ha) with 10.5% of CLR susceptible population.

In order to exploit the F_1 hybrids for production improvement, among the six identified promising Arabica F_1 hybrids, leaf samples of three hybrids (S.5059, S.5085 & S.5086) have been supplied to M/s. Jain Irrigation Systems Ltd. (JISL), Jalgaon, Maharashtra for large scale multiplication under public – private partnership, by envisaging the target of supplying tissue cultured plants during 2025 planting season.

In order to maintain all the promising F_1 Arabica hybrids developed by Central Coffee Research Institute (CCRI), in a single block, the shortlisted hybrids (S.4817, S.5059, S.5085, S.5086, S.5168 & S.5171) were top grafted on collar pruned Robusta plants. Additionally, clones and seedling grafts of all these F_1 hybrids have been raised to establish a separate clonal block of F_1 hybrids. A total 546 grafts were made by using the available suckers. Besides, the important station bred selections and advanced breeding lines of arabica were grafted on Robusta rootstocks to conserve the genetic resources.

Field evaluation of 30,000 tissue culture F_1 plants of S.4595 planted in 27 locations across Karnataka and Tamil Nadu to validate Coffee white stem borer (CWSB) tolerance indicated that growth of the F_1 plants is good under field condition and the plants are free from CWSB incidence. Further, with an objective to validate the incidence of CWSB in the seedling progenies,145.5 Kg of S.5355, (the advanced line of S.4595) was supplied to growers across the CWSB endemic areas.

Under the international collaboration with WCR- IMLVT (World Coffee Research - International Multilocation Variety Trial), 28 Arabica varieties were evaluated for yield, quality and field tolerance to Coffee leaf rust (CLR). Among the dwarf varieties, the F_1 hybrid EC-16 has recorded maximum yield

(884 Kg/ha) coupled with high field tolerance to CLR, while the control variety Chandragiri has recorded maximum yield of 811 Kg/ha. Yield was moderate in tall varieties compared to the dwarf varieties. Maximum yield among tall varieties was recorded in control variety Sln.9 (557 Kg/ha) followed by Sln.6 (551 Kg/ha) and Sln.5B (542 Kg/ha). Pacamara has recorded 79% of 'A' grade beans followed by Parainema (67.3%). As a part of evaluation of beverage quality of the WCR varieties under trial, clean Coffee samples of five different varieties (IPR -103, EC-16, Marsellesa, S.795 and Sln.6) from IMLVT plot were dispatched to World Coffee Research (WCR), Portland, for cup quality assessment. The Marsellesa has scored 'Excellent' with a score of 80.22, followed by S.795 (79.67) and Sln.6 (78.4).

During 2021-22, as a pre-emptive breeding strategy, reciprocal crosses were effected between S.5441 and Sln.10 (donor for resistance to CLR) with an objective of integrating S_H3 gene in the semi-dwarf cultivar S.5441.

With an objective of development of Trait Specific Robusta varieties, a comprehensive survey for identification of elite mother plants of Robusta was continued in Kodagu, Chikkamagaluru and Wayanad Districts, in collaboration with the Codagu Planters Association (CPA). During current year, a total of 104 elite Robusta mother plants were identified from Chikkamagaluru (67) and Kodagu (37) region for further evaluation and exploitation of the vegetative wood for multiplication. Further, the performance of the 205 mother plants identified from the various estates during last two seasons (2019-20 and 2020-21) was monitored. Clones and grafts of all the shortlisted plants have been established at CCRI and Regional Stations for further exploitation.

Under the collaborative programme, "Introduction and evaluation of new Robusta Coffee varieties of Nestle R & D", six Robusta varieties *viz.,* FRT-65, FRT-95, FRT-97, FRT-101, FRT-133 and FRT-134 have been planted along with three Indian selections in three locations *viz.,* Central Coffee Research Institute (CCRI), Chikkamagaluru District, Karnataka, Coffee Research Sub-Station (CRSS), Chettalli, Kodagu District, Karnataka and Regional Coffee Research Station (RCRS), Chundale, Wayanad District, Kerala. Initial observation indicated that, growth parameters of the Nestle Robusta variety FRT-97 is significantly superior followed by FRT-65 compared to other accessions.

During the year 2021-22, a total quantity of 12,848 Kg of seed Coffee comprising of 10,820 Kg of Arabica and 2,028 Kg of Robusta, was produced from seed blocks established at Coffee Board farms across different states. Out of these, 3,868.5 Kg was distributed to growers to traditional areas, 7,240 Kg was distributed in Non-Traditional Areas and 1,739.5 Kg was distributed to growers in North-Eastern Region.

Under pilot programme on scaling up of clonal propagation in Robusta, 44,233 clones from three Research stations and four Technology

Evaluation Centres (TECs) were distributed to 197 beneficiaries. Further, infrastructure facilities were developed to establish a clonal nursery at TEC, Gonikoppal, Kodagu District, Karnataka to meet the demand of the industry.

Division of Tissue Culture & Biotechnology, Mysuru

Among the seven identified elite hybrids (S.4814, S.4817, S.4932, Sarchimor, S.4595, S.5085 and S.5086) shared by Plant Breeding & Genetics Division of CCRI, five hybrids (S.4814, S.4817, S.4932, Sarchimor, S.4595) were successfully regenerated through somatic embryogenesis during 2021-22. Remaining two accessions, S.5085 and S.5086 are in somatic embryogenesis phase.

Towards identification of sources of tolerance to Coffee white stem borer (CWSB), seven important genes among 16 genes showing differential expression levels in response to CWSB infection were sequence characterized. The comparative sequence analysis of isoprin synthase, mannan synthase, cytochrom P450, plastid lipid associated protein, cyclophyllin, zinc finger protein and UDP-glycosyl transferase genes was carried out in 12 Coffee genotypes expressing gradient level of resistance to CWSB. The comparative sequence analysis revealed genomic changes in the form of single nucleotide polymorphism (SNP) and InDels in the coding regions of the gene sequences.

Transgenic plants of *Coffea arabica* carrying rice chitinase gene imparting tolerance to Coffee leaf rust and *Coffea canephora* carrying tobacco osmotin gene imparting drought resistance were multiplied and are being hardened. The expression of transgenes in T_0 and T_1 transgenes plants of *Coffea canephora*, examined using gus and gfp assay in different tissues such as leaf, pollens and flower buds, indicated high levels of transgene expression in both generations. The inheritance of transgenes was confirmed using Polymerase Chain Reaction (PCR) analysis.

To ascertain genetic uniformity of *in-vitro* regenerated plants, comparative study of *in-vitro* regenerated and seedling progeny of CxR plants derived from same mother plant was carried out using Sequence Related Amplified Polymorphism (SRAP) and Start Codon Targeted (SCoT) marker assays. Marker analysis revealed higher genetic fidelity among seedling progeny. Genetic fidelity was assessed by comparative sequence analysis of three functional nuclear genes and one chloroplast (matK) gene indicated higher degree of sequence variations in nuclear genome compared to plastid genome, in both progenies. The plastid genome was highly conserved among seedling progenies. However, genomic alterations in coding region were observed in zinc finger protein gene sequence of *in-vitro* derived plants.

Molecular characterization and population structure analysis of twenty Indian Coffee cultivars using SCoT markers, resulted in identification of cultivar specific bands in four cultivars. The population structure grouped the 20 cultivars into five groups and four admixture populations were identified.

DNA barcoding of nine wild Coffee species including five Indian, four African wild species and two Indian cultivars belonging to *Coffea arabica* and *Coffea canephora* was developed using sequence analysis of three barcoding loci such as rbcL, matK and trnL-trnF. Loci trnL-trnF and matK had higher species discrimination ability as compared to rbcL loci. Unique fixed nucleotide sequence was identified for all the five Indian wild species.

Molecular ITS (Internal Transcribed Spacer) based characterization led to the identification of four different fungal strains belonging to *Fusarium lateritium, Aschersonia spp., Ambrosiella xylebori and Acremonium spp.* that causes secondary infection at Coffee short hole borer infection site.

CROP MANAGEMENT

Division of Agronomy

In order to standardize suitable planting designs and to enable improved efficiency of farm operations like weeding, manuring, and spraying as well as to identify suitable pruning methods to minimize the requirement of labour for pruning, multi-location field trials were initiated at CCRI and CRSS Chettalli during 2006-07 and evaluated during the year 2021-22 on the Arabica variety 'Chandragiri'. Among the different treatments imposed, T_6 (hedge row system on multiple stems without topping (6'x3') + cyclic pruning after each harvest) having 5,808 plants/ha has registered significantly highest clean Coffee yield (1,253 Kg/ha). Further, the modified pruning systems (cyclic system and rock - roll system) has recorded the minimum number of labour requirements (25 to 41 man-days/ha) and a higher percentage of labour-saving (29-56% per hectare) over the traditional pruning system.

An higher net returns of ₹1,41,685 ha^{-1} and B:C ratio of 2 was obtained with the hedge row system of planting and modified cyclic pruning method. The hedge row system on multiple stems without topping followed by cyclic pruning after each harvest recorded a significantly higher yield of 952 Kg/ha over the traditional system of planting (729 Kg/ha).

With regard to the standardization of fertigation techniques in established Robusta Coffee (*cv.,* S.274), the fertigation with a recommended dose of fertilizer (RDF) at 100% as WSF (Water Soluble Fertilizers) through drippers has significantly increased the clean Coffee yield by 37% compared to sprinkler irrigation on account of higher fertilizer use efficiency of 2.72 Kg clean Coffee yield per Kg of N_2, P_2O_5, K_2O fertilizer.

The impact of different forms of neem cake on the yield of Arabica Coffee indicated the application of oiled neem cake powder increased yield by 10% over de-oiled neem cake.

Division of Agricultural Chemistry

To find out the effect of Mahalaabh (a proprietary product *viz*. Potassium Schoenite, a natural potassic fertilizer) on yield of Arabica and Robusta Coffee, a field trial was laid out at CCRI and CRSS, Chettalli during 2019-20.

The two years yield data revealed that, the application of 50% Mahalaabh + 50% MOP has recorded the highest yield in both Arabica (1,008 Kg/ha) and Robusta (1,759 Kg/ha) at CCRI and the same trend was observed at CRSS, Chettalli in both Arabica (951 Kg/ha) and Robusta (1,765 Kg/ha). The yield was increased to an extent of 22% in Arabica and Robusta compared to control. Based on the data, the trial was concluded with application of 50% Mahalaabh + 50% MOP is recommended for achieving higher yield in Coffee.

To assess the efficacy of RCF Chalk-Lime on soil chemical properties and yield of Arabica and Robusta coffees, a field trial was initiated during 2021-22 at CCRI. Higher yield was recorded in the treatment of broadcasting of agriculture lime/dolomite @ 1 tonne/acre (Arabica - 1,045 Kg clean Coffee per ha; Robusta - 1,844 Kg clean Coffee per ha.), compared to the treatment of broadcasting of RCF Chalk @ 1 ton/acre (Arabica - 1,029 Kg clean Coffee per ha; Robusta - 1,813 Kg clean Coffee per ha.)

A total of 8,787 soil samples received from 3,023 growers were analysed for pH, organic carbon, available phosphorus and potassium. Based on the analytical data, lime and fertilizer recommendations were rendered to the planting community.

A total of 638 agro-chemicals comprising of liming materials, copper sulphate, fertilizers and organic manures received from 415 growers were analysed for their purity. The analysis reports along with the advisory note were sent to the concerned planters.

On-spot mobile soil testing campaigns were organized at different Coffee growing regions to create awareness on soil sampling demonstration and the importance of soil test based nutrient management at village/ hobli level. During the year, campaigns were organized at different liaison zones. A total of 4,334 soil samples were analyzed for soil pH and 1,785 planters were benefited from these campaigns.

Division of Plant Physiology

The studies on rootstock scion interaction were undertaken to induce drought tolerance in Robusta Coffee during 2020-21 with Arabica seedlings such as Sln.9, Sln.6, Sln.5B, and S.4595 were used as rootstocks for S.274 and CxR Robusta scion along with individual selections as check plants. During the year 2021-22, the grafts and the respective parental lines were planted in the field to study the field performance of these grafts. The field planted grafts and parental lines were evaluated for leaf area, number of leaves, SPAD chlorophyll content, and gas exchange parameters under normal soil moisture conditions (SMC-75%). The results indicated that, the graft combinations S.4595/CxR, S.4595/S.274, Sln.5B/CxR, Sln.9/CxR and Sln.5B/S.274 are performing better under the field conditions in terms of physiological and gas exchange parameters.

To develop drought mitigating measures and improve fruit set during post-set losses, a study was conducted on 30 years old plantation of Robusta coffee (cv., CxR) at Central Coffee

Research Institute. The nutrient mixtures i.e., Calcicare (a liquid-based foliar nutrient product from M/s. K.S, Agrochemcials, Karnataka, contains Calcium, Boron, magnesium and Zinc) and hormone were sprayed on Arabica (cv, Sln.9) and Robsuta (cv., CxR) coffee during April and May months, 2021. The result of the study indicated that, the calcium sprayed along with hormone (alpha Naphthalene Acetic Acid) in Robusta and Calcicare with Drought Ameliorative Spray (Urea, Single Super Phosphate, Muriate of Potash, Zinc Sulphate and alpha naphthalene acetic acid) in Arabica Coffee recorded higher yield of 576 Kg/ha in Robusta Coffee and 677 Kg/ha in Arabica Coffee respectively as compared to control treatment (456 Kg/ha in Robusta Coffee and 582 Kg/ha in Arabica coffee respectively).

The leaf nutrient status in the Calcicare sprayed plants indicated that after two months of spraying the nutrient composition in the leaf was increased both in Arabica and Robusta Coffee. The nutrients such as Phosphorus (P), Calcium (Ca), Magnesium (Mg), Zinc (Zn) and Iron (Fe) have increased remarkably whereas other nutrients such as Nitrogen (N), Potassium (K) and Copper (Cu) have reduced in all the treatments.

A formulation was developed using micronutrients such as Mn, Zn, B, Cu, Mo, and Fe along with antioxidant growth hormone such as naphthalene acetic acid to understand its influence on the production of cropping nodes, flowering, and fruit set. After three years of continuous spray during August and September months, the improvement in the yield of Robusta Coffee was observed. The fruit yield has increased from 1,235 Kg/ha (2019-20) to 2,318 Kg/ha (2021-22) in the sprayed plot.

Changes in gas exchange parameters indirectly indicate the efficiency of plants to withstand stress conditions. To analyze the gas exchange parameters under normal and stress conditions in Arabica Coffee seedlings of S.4595, a promising cultivar showing resistance against Coffee white stem borer, moisture stress was imposed on nine months old seedlings of S.4595 and Sln.9 used as check by withholding the water till the incipient wilting stage during 2021-22. The gas exchange parameters were recorded with LICOR instrument before and after imposing as well as after alleviation of the treatment. Results indicated that under all the conditions, S.4595 performed well and maintained better gas exchange parameters when compared to the check variety Sln.9 in all the moisture stress condition. This clearly indicate that, S.4595 is best suited to drought prone areas.

CROP PROTECTION

Division of Plant Pathology

Thirty-nine designated rust races (I, II, III, IV, VI, VII, VIII, X, XI, XII, XIII, XIV, XV, XVI, XVII, XIX, XX, XXI, XXII, XXIII, XXIV, XXV, XXVI, XXVII, XXVIII, XIX, XXX, XXXI, XXXII, XXXIII, XXXIV, XXXV, XXXVI, XXXVII, XXXVIII, XXXIX, XL, XLI and XLII) were maintained in Arabica cultivars *viz.,* Bourbon and Mattari. Further, all the 39 rust races were stored in gelatin capsules and preserved at 4^0C.

A new fungicide molecule *viz.,* Amistar (Azoxystrobin 18.2% + Difenoconazole 11.4% SC) was evaluated for its efficacy in Arabica cultivar for the management of Coffee leaf rust (CLR) disease during pre and post monsoon periods in 2021-2022 season, in comparison with the recommended fungicide *viz.*, Hexaconazole 5% EC (2 ml/L) at two locations (research farms in CCRI & CRSS, Chettalli in Karnataka state). The observations recorded at CCRI revealed that least rust disease incidence was recorded in Hexaconazole 5% EC treatment (2.83%) when compared to the Amistar treatment (4.15%). Untreated control plants have recorded the highest rust disease incidence (10.61%). Similar trend was observed at CRSS, Chettalli also i.e., 7.75% of rust disease incidence in Hexaconazole 5% EC treatment; 20.5% of rust disease incidence in Amistar treatment; highest rust disease incidence in untreated control (32.19%).

Another new fungicide molecule *viz.,* Propiconazole 13.9% + Difenoconazole 13.9% EC was also evaluated for its efficacy in Arabica cultivar for the management of Coffee leaf rust disease during pre and post monsoon periods in 2021-2022 season, in comparison with the recommended fungicide *viz.*, Hexaconazole 5% EC (2 ml/L) as well as 0.5% Bordeaux mixture, at private estate. The efficacy of the new fungicide molecule was tested at various concentrations (0.25, 0.50, 1.00 & 1.50 ml/L). The data on rust disease incidence indicated that plants sprayed with Hexaconazole 5% EC have recorded minimum leaf rust incidence (0.28%), as compared to the rust disease incidence recorded in plants treated with the new fungicide molecule at the rate of 1.5 ml/L (1.14%). While, the rust disease incidence in plants treated with 0.5% Bordeaux mixture was 14.78% and the highest rust disease incidence was in untreated control (31.2%). Further, there were no phytotoxic symptoms in plants sprayed with the new fungicide molecule at 1.5 ml/L and 2 ml/L concentrations.

In addition to the above said new fungicide molecules, field trials were also conducted to evaluate two more new fungicide molecule (Picoxystrobin 6.78% + Tricyclozole 20.33% w/w SC & Picoxystrobin 7.05% + Propiconazole 11.71% w/w SC) for its efficacy in Arabica cultivar for the management of Coffee leaf rust during pre and post monsoon periods in 2021-2022 season, in comparison with the recommended fungicide *viz.*, Hexaconazole 5% EC (2 ml/L) as well as 0.5% Bordeaux mixture at private estate. The observation on leaf rust disease incidence revealed that plants sprayed with Hexaconazole have recorded minimum leaf rust disease incidence (0.13%), as compared to the rust disease incidence recorded in plants treated with the new fungicide molecules. Between the two new fungicide molecules, the efficacy of Picoxystrobin + Propiconazole was found to be better compared to the efficacy of Picoxystrobin + Propiconazole. The rust disease incidence recorded in plants treated with new fungicide molecules were in the order of 0.18% disease incidence in Picoxystrobin + Propiconazole (1 ml/L) treatment, 0.19% of disease incidence in Picoxystrobin + Propiconazole (2 ml/L)

treatment, 1.99% disease incidence in Picoxystrobin + Tricyclazole (2 ml/L) treatment and 3.59% disease incidence in Picoxystrobin + Tricyclazole (1 ml/L) treatment. The rust disease incidence in plants treated with 0.5% Bordeaux mixture was 14.63%. The highest rust disease incidence was in untreated control (23.72%).

With an objective of reducing of drudgery, a field trial was taken up to assess the influence of cocktail spraying of fungicide (Hexaconazole 5% EC for the management of Coffee leaf rust), insecticide (Chlorpyriphos 50% + Cypermethrin 5% EC for the management of Coffee white stem borer) and nutrients (macro & micro for berry development & maturation of bean) in Arabica cultivar during pre and post monsoon periods in 2021-2022 season at research farm in CCRI. The observations indicated that plants sprayed with Hexaconazole 5% EC (2 ml/L) have recorded minimum rust disease incidence (0.64%) followed by 2.22% of rust disease incidence in Hexaconazole 5% EC (2 ml/L) + nutrient mixture (19:19:19 at the rate of 5 gm/L) treatment. Maximum rust disease incidence was recorded in untreated control plants (11.9%). Further, addition of insecticide and nutrients in the spray mixture did not alter the efficacy of the fungicide.

The influence of climatic factors such as temperature, relative humidity and rainfall on Coffee leaf rust disease incidence were recorded in two Arabica cultivars Sln.3 (S.795) and Sln.13 (Chandragiri) at research farm in CCRI during 2021-2022 season. The data indicated that the rust disease incidence was observed in Arabica Sln.3 (S.795) throughout the year with the maximum rust disease incidence of 42.71% in January 2022. While in Arabica Sln.13 (Chandragiri) the rust disease initiation was noticed from August 2021 onwards with the peak disease incidence (21.03%) in January 2022. Correlation of weather parameters and rust disease incidence indicated that Coffee leaf rust incidence is positively correlated with maximum temperature & sunshine hours and negatively correlated with minimum temperature, relative humidity & cumulative rainfall.

A bulk field trial was laid out at research farm in CCRI to assess the efficacy of systemic-combi-fungicides *viz*., Pyraclostrobin 13.3% + Epoxyconazole 5% SE, Fluxapyroxad 167 gm/L + Pyraclostrobin 333 gm/L SC and Propiconazol 13.9% + Difenoconazol 13.9% EC in Arabica cultivar for the management of black rot disease during pre-monsoon periods in 2021-2022 season, in comparison with the recommended fungicide *viz*., 1% Bordeaux mixture at research farm in CCRI. The observations recorded two months after the spray indicated that the Coffee blocks sprayed with Pyraclostrobin + Epoxyconazole (1 ml/L) have registered least infestation level (3.84%) followed by 1% Bordeaux mixture spray treatment (9.52%), Fluxapyroxad + Pyraclostrobin at the rate of 0.5 ml/L (26.47%) and Propiconazol + Difenoconazol at the rate of 1 ml/L (36%). Maximum black rot infestation was seen in unsprayed control plot (48.33%).

Field evaluation of various fungicide molecules (Carbendazim 50 WP; Propiconazole 25 EC, Tebuconazole 25 EC, Trifloxystrobin 25% + Tebuconazole 50% WG & 1% Bordeaux mixture) for its efficacy to manage the Coffee stalk rot disease in CxR Robusta variety was carried out at research farm in CCRI during pre-monsoon period in 2021-2022 season. The observations indicated that least stalk rot disease incidence (1.2%) was recorded in plants treated with Trifloxystrobin 25% + Tebuconazole 50% WG (1 gm/L) followed by 1.9% of disease incidence in Tebuconazole 25 EC (1 ml/L), 3.8% of disease incidence in Propiconazole 25 EC (1 ml/L) and 6.12% of disease incidence in both Carbendazim 50 WP (1 gm/L) & 1% Bordeaux mixture. Untreated control plants have recorded the highest stalk rot disease incidence (14.25%).

Laboratory evaluation of new fungicide molecules *viz.,* Bordo Top (Copper 6% + Calcium 1.4% at the rate of 0.5% & 1%) and nano copper (at the rate of 250, 500 & 1,000 ppm) against the germination of leaf rust disease causing fungal spore revealed that there were no germination of fungal spores in Bordo Top and nano copper + spray lime treatments, at all the tested concentrations. However, germination of fungal spore was observed in treatment where only nano copper was applied (45%, 20% & 12% of spore germination at 250, 500 & 1,000 ppm nano copper respectively). The percentage of fungal spore germination in untreated control was 90%.

A new combi-fungicide molecule *viz.,* Propiconazole 13.9% + Difenoconazole 13.9% EC was evaluated against the collar rot disease causing fungus (*Rhizoctonia solanii)* under laboratory condition in comparison with recommended fungicide Carbendazim 50 WP (1 gm/L). The efficacy of the new fungicide was tested at different concentrations (0.5 ml/L, 1 ml/L, 1.5 ml/L, 2 ml/L & 2.5 ml/L). The observations revealed that the recommended fungicide Carbendazim caused 100% suppression of fungal growth when compared to Propiconazole + Difenoconazole which caused suppression of fungal growth to the tune of 30.42%, 31.88%, 36.25%, 36.64%, 46.04% at 0.5 ml/L, 1 ml/L, 1.5 ml/L, 2 ml/L & 2.5 ml/L concentrations, respectively.

Two systemic fungicides *viz.,* Picoxystrobin 6.78% + Tricyclozole 20.33% w/w SC and Picoxystrobin 7.05% + Propiconazole 11.71% w/w SC were evaluated for their efficacy against leaf spot & stem necrosis disease causing pathogen (*Myrothecium roridum*), under laboratory condition in comparison with recommended fungicide *viz.,* Propiconazole 25 EC (1 ml/L). Observations recorded after twenty days of treatment revealed that Picoxystrobin + Tricyclazole at 500, 1,000 & 2,000 ppm and Picoxystrobin + Propiconazole at 500, 1,000 & 2,000 ppm caused 100% suppression of fungal growth. The recommended fungicide *viz.,* Propiconazole caused 97.5% suppression of fungal growth at the recommended dosage.

A study was initiated to understand the influence of application of neem cake in

Coffee plantation on the microbial load in Coffee soil. The soil samples collected from oiled neem cake and de-oiled neem cake applied trial plots were subjected to microbial load under laboratory condition. The observations indicated that both bacterial and fungal population was less in soil samples collected from neem cake applied trial plots as compared to bacterial and fungal population in soil samples collected from un-treated plots.

A total of 130 Kg of *Trichoderma harzianum* starter culture was supplied to three Coffee growers for the management of root disease in Coffee.

Division of Entomology

Regular monitoring of Coffee white stem borer (CWSB) pest incidence was carried out in selected Coffee estates in different zones of Chikkamagaluru, Hassan and Kodagu districts of Karnataka state (total no. of estates visited was thirty-four). The observation revealed that the CWSB pest incidence level ranged from 6 to 50 infested Arabica plants per acre. The pest incidence levels depends mainly on the shade pattern and timely implementation of Package of Practices (PoPs) recommended by the Research Department of Coffee Board.

Data recorded on the monitoring of flight period of CWSB pest in CCRI, Balehonnur (Chikkamagaluru district) and CRSS, Chettalli (Kodagu district) indicated that there were no major changes in peak emergence period, as maximum number of CWSB adult pest emerged between April and May 2021 in summer flight period and October to December 2021 in winter flight period. Further, the results of the random survey also indicated that the extended rainfall received, and unusual weather conditions prevailed till December 2021 had no influence on the emergence pattern of CWSB pest during winter flight period of 2021.

With an objective of identifying alternate insecticide molecules to the standard fungicide molecule (i.e., Chlorpyrifos 50 EC + Cypermethrin 5 EC at the rate of 1.2 ml/L) for the management of CWSB pest, laboratory experiments were carried out to confirm the efficacy of two alternate insecticides molecules *viz.,* Phenthoate 50 EC (2 ml/L) and Fipronil 5 SC (2 ml/L) following standard laboratory methods. The observations indicated that all the three insecticide molecules exhibited 100% ovicidal activity of the CWSB pest. Further, the standard fungicide molecule and Phenthoate 50 EC showed 100% ovi-positional deterrence activity up to 25 days after spray while Fipronil 5 SC exhibited ovi-positional deterrence activity only up to five days after spray. Thus, the efficacy of Phenthoate 50 EC at the rate of 2 ml/L was found to be on par to the efficacy of the standard fungicide molecule.

A multi-location field trial on the effectiveness of non-woven fabric (NWF) material was carried out at Coffee Board's Research farm in CRSS, Chettalli and two selected private estates in Kodagu district for the management of CWSB pest during 2021-2022. A total of 3,720 CWSB infested Arabica plants were wrapped with NWF material followed by spraying of Chlorpyrifos 50 EC + Cypermethrin

5 EC (1.2 ml/L). Random sampling of fifty NWF wrapped Arabica plants across three locations indicated that only seven CWSB adult beetles were escaped from the wrapped Arabica plants in a particular private estate. The reasons for beetle escape from the wrapped plants were poor quality of NWF material and improper wrapping of infested Arabica plants.

With an objective of identifying alternate insecticide and bio-pesticide molecules to the standard insecticide molecule (i.e., Chlorpyrifos 50 EC + Cypermethrin 5 EC at the rate of 1.2 ml/L) for the management of CWSB pest, field trial was conducted at CRSS, Chettalli with alternate insecticide molecule (Spinosad 45 EC) and bio-pesticides (Neemazol™ & Pongamia oil). The infested Arabica Coffee plants were wrapped with NWF material followed by spraying with Spinosad 45 EC (0.3 ml/L), Neemazol™ (6 ml/L) and Pongamia oil (6 ml/L). Random observation of insecticide and bio-pesticides sprayed Arabica plants indicated that Arabica plants wrapped with NWF & sprayed with the standard fungicide molecule (i.e. Chlorpyrifos 50 EC + Cypermethrin 5 EC at the rate of 1.2 ml/L) recorded the highest mortality of CWSB adult beetle (99%) followed by NWF + Chlorpyrifos 50EC (96%), NWF+ Spinsod (94%), NWF + Neemazol (92%) and NWF + Pongemia oil (87%).

The efficacy of Bio-Nano Formulation (BNF) supplied by Tamil Nadu Agriculture University (TNAU), Coimbatore was evaluated against CWSB pest at research farm in CCRI. The BNF was evaluated for its ovi-positional deterrence, ovicidal and the larvicidal action at different concentrations (100, 200, 300, 2,500, 5,000 & 10,000 ppm) following standard laboratory methods. The results of laboratory experiment revealed that the BNF did not show any ovicidal and larvicidal action at all the concentrations tested in the evaluation trial. However, BNF exhibited 70% of ovi-positional deterrence activity at the highest concentration tested in the evaluation trial (i.e., 10,000 ppm).

The efficacy of another bio-formulation “Pesto Borer Care (PBC)” supplied by M/s. Pestmatic Controls, Maharashtra against CWSB pest was evaluated for ovi-positional deterrence, ovicidal action and larval mortality at different levels (1:1, 1:5, 1:10, 1:15, 1:20) by adopting standard laboratory procedures. The observation revealed that the PBC did not show ovi-positional deterrence, ovicidal and larvicidal activities at all the concentrations tested in the evaluation trial.

The efficacy of both BNF and PBC formulations was also evaluated for the management of other major Coffee pests *viz.,* Coffee berry borer (CBB) and shot hole borer (SHB) at laboratory conditions. Application of BNF to the Coffee fruits at the rate of 5,000 ppm achieved reduction of CBB infestation or the avoidance of CBB beetle to the extent of 80%. While application PBC did not show any effect on the mortality of CBB and SHB pests at all concentrations tested in the laboratory trial (1:1, 1:5, 1:10, 1:15 & 1:20).

Monitoring of SHB pest incidence in two Robusta varieties (CxR Robusta & old

Robusta) under different shade patterns at research farm in CCRI revealed that SHB pest incidence ranged from 0.26% to 10.96% in CxR Robusta and 0.24% to 10.4% in old Robusta with the peak incidence level in November month and extended up to March. Further, maximum SHB pest incidence was noticed in plantation under thick shade followed by thin shade and recommended shade level.

Monitoring of SHB pest incidence in two Robusta varieties (CxR & S.274) at research farm in RCRS, Chundale (Kerala) revealed that SHB pest incidence ranged from 7.2% to 18.21% in C×R and 6.4% to 16% in S.274 variety with the peak incidence level in February month.

Random survey of Robusta Coffee estates in Kodagu district for the incidence level of SHB pest from October 2021 to January 2022 revealed that 40% to 60% of the Robusta plant population was found infested with SHB pest with the incidence level of 10 to 20 branches per plant. Further, the incidence of SHB pest was found to be high in fertigated Robusta estates, as compared to those Robusta Coffee estates received irrigation only during the pre and post-blossom periods.

To assess the influence of trap designs for trapping of SHB pest, studies were conducted at research farm in CCRI farm using various types of traps (glass fruit fly trap, cylindrical fruit fly trap, single funnel trap, multiple funnel trap & Broca trap) containing 50% absolute ethanol as lure material. Among the various trap types tested, Broca trap has attracted the highest number of SHB beetles (28 beetles per trap) when compared to other traps tested. The number of SHB beetles trapped in other trap types ranged from one to two SHB beetles.

To determine the ideal trapping lure for trapping maximum numbers of the SHB pest, studies were conducted at the research farm in CCRI using various lures (50% distillery ethanol, 100% distillery ethanol, 50% absolute ethanol, 90% absolute ethanol, 100% absolute ethanol & Broca lure). Among the various lures tested, Broca trap with 50% absolute ethanol has attracted maximum number of SHB adult beetle throughout the study period followed by Broca trap with 95% absolute ethanol. While at the research farm in RCRS, Chundale (Kerala) Broca trap containing Coffee twig/ branch extract in ethyl alcohol has attracted the highest numbers of SHB pest (14 nos.) when compared to other lures tested such as ethyl alcohol (4 nos.), methyl alcohol (2 nos.), isopropyl alcohol (1 no) twig extract in methyl alcohol (1 no) and Broca lure (1 no).

Various bio-control agents (*viz*., *Trichoderma harzianum*, *Beauveria bassiana, Verticillium lecanii, Metarhizium anisopliae, Bacillus subtilis & Bacillus cereus*) were evaluated for the management of SHB pest at research farm in CCRI. The results revealed that *Beauveria bassiana* has caused significant mortality of SHB adult beetle (82.5%) and progeny mortality (76%) followed by *Trichoderma harzianum* (adult mortality-76%; progeny mortality - 70%) and *Metarhizium*

anisopliae (adult mortality-75%; progeny mortality-68.5%).

Laboratory and field evaluation of various insecticides (Chlorpyrifos 50 EC + Cypermethrin 5 EC, Chlorpyrifos 20 EC & Lambda-Cyhalothrin 5 EC) and fungicides (Hexaconazole 75 WG, Tebuconazole 25.9 EC & Propiconazole 25 EC) either as stand-alone or in combination were attempted for the management of SHB beetle at research farm in CCRI. The result indicated that insecticidal spray caused more mortality to SHB pest, as compared to fungicidal spray. Among the insecticides, Chlorpyrifos 50 EC + Cypermethrin 5 EC (1 ml/L), Chlorpyrifos 20 EC (3 ml/L) and Lambda-Cyhalothrin 5 EC (2 ml/L) produced 100% adult mortality. However, the efficacy of these insecticides for the mortality of progenies (larval stages) present inside the Coffee twig/branch was found to be less compared to adult mortality. The maximum progeny mortality of 47% was recorded in plants sprayed with Chlorpyrifos 50 EC + Cypermethrin 5 EC (1 ml/L) followed by Chlorpyrifos 20 EC at the rate of 3 ml/L (41.7%), Chlorpyrifos 50 EC + Cypermethrin 5 EC at the rate of 0.5 ml/L (40.11%) and Lambda Cyhalothrin 5 EC at the rate of 0.5 ml/L (39.78%).

Various bio-control agents *viz*., *Beauveria bassiana, Metarhizium anisopliae, Bacillus subtilis, Pseudomonas fluorescens*, *Paecilomyces lilacinus*, *Trichoderma viridae*, and *Steinernema carpocapsae* were tested for their efficacy to check the root grubs population in Coffee plantation. The observations indicated that fungal bio-control agents produced more mortality of root grubs population than bacterial bio-control agents. Among the bio-control agents tested, *Beauveria bassiana* has caused the highest mortality of root grubs population (70%) followed by *Tricoderma viridae* (66%) and *Paecilomyces lilacinus* (64%).

Field evaluation of various pesticides (Chlorpyrifos 20 EC, & *Dimethoate 30 EC), fungicides (Carbendazim 50 WP* & *Propiconazole 25 EC*) and botanical formulation (Neemazol) was carried out in Arabica plants for the management of root mealy bug at research farm in CRSS Chettalli during 2021-22 season. The results of evaluation study revealed that combined drenching of Dimethoate 30 EC + Propiconazole 25 EC resulted in significant mortality of root grub population (95.81%) followed by Dimethoate 30 EC + Carbendazim 50 WP (93.25%), Chlorpyrifos 20 EC + Propiconazole 25 EC (92.5%) and Chlorpyrifos 20 EC + Carbendazim 50WP (89.41%). The botanicals and fungicide combinations (Neemazol + Propiconazole 25 EC & Neemazol + Carbendazim 50 WP) resulted in 65.25% and 69% of root mealy bugs mortality, respectively.

POST HARVEST TECHNOLOGY

Division of Post-Harvest Technology:

Cup quality analysis of Arabica and Robusta Coffee sample dried in sun and rotary mechanical dryer at 40^{o}C, 50^{o}C and 60^{o}C indicated that the Arabica cherry sample dried in mechanical dryer at 40^{o}C has registered higher cup rating (76.75 out of 100) followed by sun dried sample (76), mechanically dried

sample at 50°C (75.25) and 60°C (74.25). In case of Robusta, sample dried in mechanical dryer at 50°C has scored higher cup rating (76.75) followed by sun dried sample (76) and mechanically dried at 60°C (74.25). These results revealed that there are no significant differences in the cup quality scores of Arabica and Robusta cherry samples dried in sun and rotary mechanical dryer.

Cup quality analysis of Arabica and Robusta Coffee samples subjected to various fermentation techniques indicated that Arabica Coffee samples subjected to under-water fermentation has scored higher cup rating (69 out of 100) followed by dry aerobic fermentation (68.5) and anaerobic fermentation (65.75). While in case of Robusta, anaerobically fermented Coffee has scored higher liquor rating (72) followed by under-water fermentation (70) and dry aerobic fermentation (65).

Arabica Coffee samples processed by semi-dry method (otherwise called as pulped natural or honey Coffee) were dried in sun, semi-shade and full-shade conditions so as to create variations in the quality profile of pulped natural Coffees. The cup quality analysis of these pulped natural Coffees indicated that pulped natural Coffee samples dried in sun has recorded higher cup rating (79.25 out of 100) followed semi-shaded condition (69.25) and fully-shaded condition (63.75).

Outturn refers to the amount of commercial Coffee beans obtained from raw Coffees *viz*., parchment and cherry Coffees and it has direct bearing on price realization (higher the outturn percentage greater the price realization). The outturn percentage of Arabica and Robusta Coffee samples processed at various Coffee Research Stations and Technology Evaluation Centres of Coffee Board were compiled during 2021-22 harvest season. The compiled data indicated that the average outturn percentages for Arabica Parchment, Robusta Parchment, Arabica Cherry and Robusta Cherry were 82.1%, 82.9%, 53.4% & 52.7%, respectively. These outturn values are well within the outturn percentages prescribed by the Research Department of the Coffee Board.

A total of twelve bacterial and twenty-seven *Yeast* isolates were isolated from Arabica ripe Coffee fruits. These microbial isolates were screened for pectinase and cellulolytic activities under laboratory condition. Microbial isolates with superior pectinase as well as cellulolytic activities will be employed in Coffee fermentation trials and Coffee effluent treatment processes to assess their potential in improving Coffee quality and Coffee effluent treatment processes.

Six *Yeast* isolates with superior pectinase and cellulolytic activity (CCRI 2021 RF YI 2, CCRI 2021 RF YI 8, CCRI 2021 RF YI 12, CCRI 2021 RF YI 16, CCRI 2021 RF YI 18 and CCRI 2021 RF YI 21) were mass multiplied under laboratory condition. A known quantity of Robusta ripe fruits was inoculated with the superior *Yeast* isolates in 1:15 ratio (i.e., 400 ml culture in 6 Kg fresh cherry) individually and incubated for 12 hours. Similarly, depulped Robusta fruit and Robusta wet parchment

samples were also inoculated with the superior *Yeast* isolates. Following the inoculation, the depulped Robusta fruits was fermented for 12 and 72 hours while Robusta wet parchment samples was fermented for 12 hours. Then the Coffee samples were sun dried until it attained the prescribed moisture level of 10%. The dried Coffee samples were further processed to obtain Coffee bean samples and the Coffee bean are submitted for the evaluation of cup quality.

With an objective of developing a microbial consortium for treating the effluent generated from wet processing of Coffee, *Yeast* and bacterial isolates (four isolates each) with superior pectinase and cellulolytic activity (CCRI 2021 RF YI 2, CCRI 2021 RF YI 8, CCRI 2021 RF YI 12, CCRI 2021 RF YI 16, CCRI 2021 RF BI 3 and CCRI 2021 RF BI 4, CCRI 2021 RF BI 5 & CCRI 2021 RF BI 7) were mass multiplied under laboratory condition. A known quantity of Coffee effluent was inoculated with the superior *Yeast* and bacterial isolates individually in 1:15 ratio (i.e., 400 ml culture in 6 litre effluent). The initial pH and BOD levels in the Coffee effluent sample were 5.14 & 3,900 ppm, respectively. After twelve days of incubation, the pH level in control effluent sample was 5.56 and 6.81 in effluent inoculated with the *Yeast* isolate *viz.,* CCRI 2021 RF YI 2. While, the BOD level in control effluent sample was 2,300 ppm and 1,300 ppm in effluent sample inoculated with the *Yeast* isolate *viz.,* CCRI 2021 RF YI 2. These data indicated that the *Yeast* isolate *viz.,* CCRI 2021 RF YI 2 is appears to be superior, as compared to other *Yeast* and bacterial isolates. Further studies will be taken up to ascertain the efficacy of the *Yeast* isolate *viz.,* CCRI 2021 RF YI 2 for treating the Coffee effluent.

Biochar is a soil ameliorant produced from the combustion of agro-wastes under no oxygen condition. Biochemical characterization of biochar is very essential for determining its agronomic potential. Biochemical characterization of biochars obtained from Coffee processing wastes (cherry husk & parchment husk) and crop residues from Coffee plantation (diseased uprooted Coffee stem & pepper stem waste) indicated that cherry husk yielded the highest biochar yield (40.53%) followed by parchment husk (30%), diseased uprooted Coffee stem (28.5%) and pepper stem waste (21.95%). The highest pH level was recorded in biochar obtained from pepper stem waste (10.85) followed by diseased uprooted Coffee stem (9.57) and cherry husk (8.88) and parchment husk (8.23). Among the four biomass studied, the highest fixed carbon content was recorded in biochar obtained from cherry husk (54.53%) followed by diseased uprooted Coffee stem (51.82%) parchment husk (48.5%) and pepper stem waste (26.1%). Regarding water holding capacity of biochar, the soil amended with 10% biochar has recorded 34.46% of moisture level in soil samples, as compared to soil sample without biochar (25.38%) indicating the water holding capacity of soil amended with biochar is found to be superior (36% more), as compared to control sample. These data

indicated that biochar from Coffee processing wastes has high agronomic potentials.

Coffee fruits harvested from four tree Coffee species (*Coffea liberica, Coffea excelsa, Coffea abeokutae & Coffea arnoldiana* which are available at tree Coffee museum at research farm in CCRI) were processed during 2020-2021 harvest season. During the year 2021-22, the Coffee bean samples from these four tree Coffee species were analyzed for caffeine and chlorogeneic acid contents at Analytical Laboratory, Bengaluru. The lowest caffeine content was recorded in *Coffea liberica* (0.295%) followed by *Coffea abeokutae* (0.53%), *Coffea excelsa* (0.799%) and *Coffea arnoldiana* (0.814%). The highest chlorogeneic acid content was recorded in *Coffea liberica* (6.95%) followed by *Coffea arnoldiana* (6.91%), *Coffea excelsa* (6.15%) and *Coffea abeokutae* (5.51%). *Coffea liberica* is seems to be potential trees Coffee species, as it contains less caffeine and more chlorogeneic acid.

Fourteen Coffee effluent samples received from three private estates during 2021-2022 harvest season were analyzed for various pollution parameters (pH and biological oxygen demand levels) on chargeable basis. The analysis reports along with advisory notes were communicated to the concerned estate authorities. Further, one Coffee sample received from a planter was tested for moisture content and outturn percentage. The test report along with the advisory note was sent to the concerned planter.

Division of Coffee Quality

Visual and cup quality evaluation of Coffee samples received from various stakeholders in the Coffee value chain and Research Departments of the Coffee Board were assessed. A total of 875 Coffee samples (comprising of 525 commercial samples received from 83 stakeholders & 350 samples supplied by the Research Departments of the Coffee Board) were evaluated for physical and cup quality parameters. The quality evaluation reports were communicated to the concerned stakeholders and research departments.

A total of 128 moisture meters received from fourty-seven Coffee curers / traders were calibrated at the Analytical Laboratory, Bengaluru and issued the calibration reports. Further, two green Coffee samples received from a private Coffee quality laboratory were tested for moisture content following oven dry method and issued the test report. In addition, twenty-three Coffee samples received from fourteen stakeholders were analysed for nutritional parameters and issued the analysis report. Five green Coffee samples received from five Coffee traders was tested for Ochratoxin-A (OTA) residue content and the test reports were issued to the concerned traders.

Four “Kaapi Shastra” training programmes on “Coffee Roasting-Brewing-Packaging-Retailing” were organised by Coffee Board during 2021-2022 period that benefited ninety participants. Further, a 3-Day training programme on “Coffee Entrepreneurship

Development on Value Addition and Marketing of Coffee" was conducted from 22nd to 24th August 2021 at New Delhi covering fourteen participants.

Under the "Support to Value Addition / Support for R & G Units" programme, subsidy was extended to nineteen Coffee roasting units during the period under reporting.

Fifteen students of the Post Graduate Diploma in Coffee Quality Management System (PGDCQMS) belonging to 2019-2020 batch have successfully completed the course during 2021-2022. Twelve students who joined during 2020-2021 batch have completed 1st & 2nd trimesters and currently undergoing 3rd trimester at Coffee Quality Evaluation Division at Bengaluru. Thirteen students who joined in 2021-2022 academic year are presently attending 1st trimester on "Coffee Production System" at Central Coffee Research Institute, Chikkamagaluru, Karnataka.

With an objective of protecting and promoting the unique Regional and Specialty Coffees of India, the Coffee Board has obtained Geographical Indication (GI) registration for seven different Coffees. Further, the Coffee Board is extending the facility of Authorized User Registration (AUR) of these GI tagged Coffees by various stakeholders in the Coffee value chain. In this direction, eight AUR certificates were issued (seven for Coorg Arabica Coffee & one for Wayanad Robusta Coffee) during 2021-22. Further, AUR certificates were also issued to three Research Farms (Coffee Research Sub Station at Chettalli in Kodagu District, Karnataka, Regional Coffee Research Station, Chundale, Wayanad District, Kerala & Regional Coffee Research Station at R.V. Nagar in Andhra Pradesh) and five Technology Evaluation Centres (two in Kerala state and one each in Chikkamgaluru district of Karnataka, Andhra Pradesh & Odisha) of the Coffee Board. In addition, four applications received from the stakeholders were processed and submitted to GI Registry, Chennai for further processing.

Efforts are underway to obtain the National Accreditation Board for Testing & Calibration Laboratories (NABL) accreditation for both quality and analytical laboratories established under the Trade Infrastructure and Export Scheme (TIES) project.

Physio-chemical analysis of twenty commercial Coffee: chicory blends [comprising of both filter Coffee powder (FCP) & Instant Coffee Powder (ICP)] indicated that FCP samples have registered higher pH value (FCP -5% to 5.8%; ICP - 4.7% to 5%), total solid content (FCP -2.9% to 4.9%; ICP - 1.7% to 3.9%), polyphenol content (FCP - 4.1% to 5.2%; ICP – 2.4% to 4%) and melanoidin pigment content (FCP – 0.2 % to 0.8%; ICP- 0.2% to 0.3%). While, ICP samples have recorded higher values in case of moisture level (FCP – 1.5% to 3%; ICP- 2.25% to 5.55%), titratable acidity (FCP- 4.3% to 6.6%; ICP – 6.6% to 10.6%), caffeine content (FCP- 0.7% to 1.2%; ICP- 1.4% to 2.9%), chlorogenic acid content (FCP -2% to 3.9%; ICP- 5.3% to 10.2%) and anti-oxidant activity (FCP- 77% to 86%; ICP- 83% to 87%).

Preliminary results of the study on “Influence of different Coffee brewing methods (Indian filter Coffee, moka pot, french press, aero-press, chemex, pour over and cold brew) on cup and biochemical parameters” indicated that Coffees prepared by moka pot and cold brew methods were found to contain comparatively more caffeine, nitrogen & protein contents followed by aeropress and Indian filter Coffee methods when compared to Coffees prepared by chemex, pour over and french press methods. Chlorogenic acid content was relatively less in Coffees prepared by Indian filter Coffee and moka pot methods as compared to other methods. The results of the electronic nose analysis revealed that there was significant difference in the aromatic profile of the Coffee prepared by moka pot method when compared to other brewing methods.

Under the study on “Mapping of Cup Quality of Coffee Samples from different Coffee growing regions”, four types of Coffee sample (Arabica Parchment, Arabica Cherry, Robusta Parchment & Robusta Cherry) collected from five regions *viz*., Chikkamagaluru, Coorg, Manjarabad, Shevaroys & Pulneys were analysed for aromatic profile using electronic nose. It was noticed that there were significant differences in the aromatic profile of Arabica parchment Coffee samples collected from different regions while there were no striking differences in the aromatic profile of the other Coffee types such as Arabica Cherry, Robusta Parchment and Robusta Cherry.

Webinars and Capacity Building Programmes:

The Research Department of the Coffee Board has organized fifteen webinars during 2021-2022 academic year and 1,112 stakeholders participated in these webinars. In addition, four training programmes on **“Coffee Production and On-Farm Processing of Coffee”** was conducted covering 101 stakeholders.

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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 3,67,582 Ha., which accounts for 77.93% of the total area of 4,71,656.15 Ha. in the country. The number of holdings in Traditional Areas are 1,76,078 which account for around 43.30% of the total number of 4,06,691 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 2021-22 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		
	Arabica	Robusta	Total	Arabica	Robusta	Total	<10 ha.	>10 ha.	Total
Karnataka	1,07,186	1,38,864	**2,46,050**	98,496	1,29,115	**2,27,611**	77,961	2,246	**80,207**
Kerala	4,231	81,649	**85,880**	3,955	81,021	**84,976**	77,584	277	**77,861**
Tamil Nadu	29,338	6,314	**35,652**	27,900	6,004	**33,904**	17,665	345	**18,010**
Total	**1,40,755**	**2,26,827**	**3,67,582**	**1,30,351**	**2,16,140**	**3,46,491**	**1,73,210**	**2,868**	**1,76,078**

1.2.Weather Conditions and Crop Production for 2021-22

During the year 2021, the receipt of blossom and backing showers was satisfactory in all the Coffee growing tracts of the Traditional Areas, followed by normal weather condition, which helped in establishment of new clearings & retention of general soil moisture in Coffee plantations. The southwest monsoon set in during the second fortnight of June 2021 with feeble note and gained its momentum through July-September months and brought in copious showers which helped in rejuvenation of tanks and streams, recharging of bore wells. The monsoon helped in maintaining the soil moisture and vegetative growth of the Coffee plants. The rainfall received during the monsoon period of 2021 was less in comparison to the corresponding period of 2020 in traditional areas.

During North-East monsoon, depressions in Bay of Bengal and Arabian Sea lead to

medium to heavy rainfall during November 2021 affecting Coffee by dropping and splitting of fruits, decaying and mould formation on fruits, thereby reducing the Coffee quality and the yield of Robusta. Overall, the seasonal conditions prevailed during 2021-22 was favorable for the general health of plants and crop.

The Final Crop estimates in respect of Traditional Coffee growing areas for the season 2021-22 was placed at 3,29,520 tonnes comprising 82,640 tonnes of Arabica and 2,46,880 tonnes of Robusta. The state-wise details are as under:

Table: Final Estimates of Coffee Production in Traditional Area (2021-22)

State	Production Estimates (tonnes)		
	Arabica	**Robusta**	**Total**
Karnataka	68,025	1,73,625	2,41,650
Kerala	1,900	68,000	69,900
Tamil Nadu	12,715	5,255	17,970
Total	**82,640**	**2,46,880**	**3,29,520**

1.3. Pests and Diseases

The incidence of White Stem Borer, which is a major pest of Arabica, was generally low to medium and in endemic areas. The incidence of Coffee Berry Borer was also low to medium 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 incidence of Giant African Snail (GAS) was low in the Coffee tracts. Necessary measures were advocated to manage the pests and diseases.

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

1.4. 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 enhance the knowledge & 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 adopted 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, 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 and crop loss survey during natural calamity.

The details of various extension activities carried out during the year 2021-22 are as under:

Sl. No.	Activities	Achieve-ment (Nos.)
1	Estate Visit	22,394
2	Selection of Model Estates	140
3	Field Demonstrations	1,207
4	Village level meetings	150
5	Seminars	7
6	Capacity Building Programmes on Coffee cultivation at TECs	62
7	Advisory	
	a) Print Media	63
	b) Electronic Media (Radio talks / TV programme)	10
	c) Social media	979
8	Exposure visits	15
9	Vocational training programme for women workers/ growers	14

1.5. 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 a training and also as seed production centres.

Table: Details of Technology Evaluation Centres (2021-22)

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.
Karnataka												
1	Arasinaguppe, Chikkamagaluru	1980	6.50	0.00	**6.50**	6.00	0	**6.00**	3391	0	522	0
2	Hesgal, Mudigere	1977	8.83	0.42	**9.25**	8.83	0.42	**9.25**	2136	280	242	667
3	Matasagara, Sakaleshpur	1959	5.23	1.25	**6.48**	4.53	1.25	**5.78**	1931	1959	426	1567
4	Gonikoppal	1958	0	10.56	**10.56**	0	10.56	**10.56**	0	9674	0	916
Kerala												
1	Kalpetta	1958	0.27	6.93	**7.20**	0.27	6.63	**6.90**	21	6050	78	913
2	Mananthavady	1979	0.50	8.30	**8.80**	0.50	8.18	**8.68**	41	4737	82	579
3	Vazhavara	1998	0.70	1.84	**2.54**	0.70	1.84	**2.54**	483	2693	690	1464
Tamil Nadu												
1	Gudalur	1985	2.13	3.44	**5.57**	1.36	2.4	**3.76**	651	2622	479	1093
2	Bodinayakanur	1983	4.15	0	**4.15**	3.10	0	**3.10**	1438	0	464	0
3	Yercaud	1986	10.0	0	**10.00**	10.0	0	**10.00**	2941	0	294	0

1.6. 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 2021-22 (MTF period)

Sl. No.	Component / Activity	No. of Benefic-iaries/ No. of Units	Area benefited in Ha.
1	Replantation#	19	23.78
2	Water Augmentation	280 /299	807.44
3	Quality Upgradation*	17 / 21	19.36

(*-Only to SC growers)

#Excludes 2nd installment beneficiaries of 828 & area benefitted of 619.59 ha.

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 No. 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	40843.23	0.52	**40843.75**	33317.03	0.52	**33317.55**	106605	2	**106607**
Chintapalli (E & W)	37080.89	263.71	**37344.60**	30823.79	263.71	**31087.50**	69961	3	**69964**
Arakuvalley	16767.60	0	**16767.60**	12567.60	0	**12567.60**	41479	1	**41480**
Total AP:	**94691.72**	**264.23**	**94955.95**	**76708.42**	**264.23**	**76972.65**	**218045**	**6**	**218051**
Odisha	4415.53	0	**4415.53**	4182.73	0	**4182.73**	4416	19	**4435**
Chhattisgarh*	8.00	0	**8.00**	0	0	**0.00**	1	0	**1**
Grand Total	**99115.25**	**264.23**	**99379.48**	**80891.15**	**264.23**	**81155.38**	**222462**	**25**	**222487**

*Darbha Block, Bastar District, Chhattisgarh has taken up Coffee in 2018-19 under CHRS, Jagadalpur, CG (IGAU, Raipur)

2.2. Weather Conditions and Crop Production

In Andhra Pradesh, the weather was congenial for development of Coffee during 2021-22. Blossom showers received during April 2021, followed by backing showers during May 2021, helped in better blossom and fruit set. The South West (SW) monsoon was set during June 2021 and was active up to October 2021. These showers were 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, the blossom showers were received during the second week of February 2021 and subsequent showers were received during April 2021 in most of the Coffee growing areas. The SW monsoon commenced during 1st fortnight of June 2021 and continued upto 2nd fortnight of October 2021.

Considering the overall situation, the final crop estimates for 2021-22 season was placed at 12,330 tonnes comprising 12,290 tonnes of Arabica and 40 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 2021-22. 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 of production, productivity and quality of Coffee in the tribal sector.

The details of various extension activities carried out in Non-Traditional Areas during the year 2021-22 are as under:

Sl. No.	Activities	Achievement (Nos.)
1	Estate visits	1,578
2	Method demonstration	691
3	Group gatherings addressed	145
4	Village level workshops	60
5	Capacity Building Programmes at TECs	30
6	Exposure visits	97

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 and also as seed production centres for quality seed Coffee.

Name of the TEC	Year of commence-ment	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											
TEC Minumuluru	1971	**8.15**	**0.52**	**8.67**	**7.75**	**0.52**	**8.27**	**1978**	**316**	**255**	**608**
Odisha											
TEC Koraput	1978	**9.992**	**0.55**	**10.542**	**9.992**	**0.55**	**10.542**	**4236**	**86**	**424**	**156**

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 and Odisha. During 2021-22, a quantity of 11,097 Kg 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 2021-22 is furnished below:

Table: Achievement under Coffee Development programme during 2021-22

Activities	Area / Units
Coffee Expansion / Consolida-tion (Area in Ha.)	-
Quality up-gradation	
a) Drying yard (No. of units)	157
b) Baby pulpers (No. of units)	320

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	153.52	428.50	130.00	84.45	214.45	1,031	1	1,032
3	Manipur	128.30	38.60	166.90	14.05	0.00	14.05	229	0	229
4	Meghalaya	266.70	836.77	1,103.47	164.59	213.37	377.96	2,180	0	2,180
5	Mizoram	1,244.65	75.35	1,320.00	374.22	13.90	388.12	2,108	1	2,109
6	Nagaland	830.30	102.00	932.30	201.05	2.00	203.05	1,542	1	1,543
7	Tripura	134.25	130.05	264.30	101.10	20.00	121.10	558	0	558
	Grand Total	**2,881.68**	**1,812.99**	**4,694.67**	**985.01**	**495.62**	**1,480.63**	**8121**	**5**	**8,126**

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 2021-22 season was placed at 150 tonnes comprising 70 tonnes of Arabica and 80 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	2,526
2	Field demonstration	2,104
3	Group meetings / seminars	264
4	Capacity Building Programmes at TECs	7
5	Quality awareness campaigns	34
6	On-farm training	59
7	Study Tours - Internal	15

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 commen-cement	Planted Area in Ha.			Bearing Area in Ha.			Production (Kg.) (Post-blossom)		Productivity (Kg/ha)	
		Ar.	Rob.	Total	Ar.	Rob.	Total	Ar.	Rob.	Ar.	Rob.
North Eastern Region											
Deomali	1983	0.00	13.0	13.0	0	13.0	13.0	**0**	**10,000**	**0**	**769**
Haflong	1980	2.98	6.62	9.6	2.08	4.4	6.48	**500**	**2,000**	**240**	**455**
Bualpui	1988	10.5	0	10.5	8.4	0.0	8.4	**2,500**	**0**	**298**	**0**
Tulakona	1986	0.00	8.4	8.4	0	8.0	8.0	**0**	**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.)	76.4
Consolidation of Coffee (in Ha.)	3.4
Group Nursery (Nos.)	25
Drying Yard (Units)	20

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 99 Nos. training and skill building programmes on various aspects of Coffee cultivation was conducted for the benefit of Coffee growers, estate workers and supervisory staff at the Technology Evaluation Centres of Coffee Board.
- Fourteen Vocational training programmes for women were conducted for the benefit of 293 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 to Small Grower Collectives / SHGs / Cooperatives for Coffee Marketing
C. 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 Coffee, Coffee samples of all growing regions, special packets containing Coffees powder specialty Coffees, literature on Indian Coffee, making the public aware about the advantages of Coffee drinking through publicity materials and also serves the pure Coffee to the visitors.

During the year 2021-22, Coffee Board participated in 11 Expos in the country for promotion of Coffee consumption through consumer awareness and education about positive effects of Coffee consumption on human health. 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.

Details of Domestic Events Participation during the Year 2021-22

Sl. No.	Name of the event	Period	Remarks
1	IBSA Coffee festival	4th to 5th August 2021	Virtual platform
2	Vanijya Utsav, Ashoka Hotel, Bengaluru	21st 22nd September 2021	Physical event
3	Fro Pro Expo, Nimhans Convention Hall, Bengaluru	22nd 23rd October 2021	Physical event
4	SIAL India, Pragathi Maidan, New Delhi	9th to 11th December 2021	Physical event
5	Indian Restaurant Congress, New Delhi	2nd to 3rd December 2021	Physical event
6	Krishi Mela, UAS, Bengaluru	11th to 14th November 2021	Physical event
7	World Tea & Coffee Expo, Ahmedabad	2nd to 4th December 2021	Physical event
8	Agro Food & Beverage, Goa	2nd to 4th December 2021	Physical event
9	Agro Vision, Odisha	6th to 8th Feb 2022	Physical event
10	AAV, Jorhat	11th to 12th March 2022	Physical event
11	Momentum 2022, Guwahati	24th to 25th March 2022	Physical event

Apart from the above, Coffee Board continued its efforts for promotion of Coffee consumption through India Coffee Houses and India Coffee Depots by sale of Pure and high-quality Indian Coffees across various locations in the country. At present, nine 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 under 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. Totally 04 programmes were conducted during 2021-22 and 90 participants attended the programme at Head Office. The details are as follows:

Sl No.	Venue	Particulars	No. of Participants
1	Head Office, Bengaluru	13th – 17th September 2021	20
2	Head Office, Bengaluru	08th – 12th November 2021	26
3	Head Office, Bengaluru	13th – 17th December 2021	26
4	Head Office, Bengaluru	07th -11th March 2022	18
		Total	**90**

2. Coffee Entrepreneurship Training Programme

Coffee Entrepreneurship Training Programme is conducted for roasters /hoteliers /restaurants / institutional caterers and entrepreneurs. The main objective is to import knowledge on business opportunity in Coffee sector. Also, to evaluate the quality of Coffee, blending of different grades of Coffee and start and manage a café.

It's a three days training programme conducted at Delhi Institute of Hotel Management & Catering Technology, New Delhi during 22nd – 24th August 2021 and 14 participants were attended the programme.

3. Post Graduate Diploma in Coffee Quality Management

Twelve students joined during 2020-21 completed the second trimester at Coffee Quality Division during the year. Thirteen students were enrolled for the course during 2021-22 batch are in their first trimester at Central Coffee Research Institute, Balehonnur during the reporting period.

B) 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.

C) 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 main objective this component 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 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 1 Kg 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 specialized 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 19 units under the component.

CHAPTER – VII

EXPORT PROMOTION

Coffee Exports

Exporter Registration and Renewal

The total number of exporters registered with Coffee Board as on 31st March 2022 were 1,604 as against 1,423 on 31st March, 2021. This includes 181 new registrations and 102 renewal of registrations made during the year 2021-22.

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 of both Indian and re-exported Coffee. A total of 13,258 export permits and ICO Certificates of Origin have been issued to 308 Registered Exporters of Coffee during the year 2021-22 as against 11,446 permits issued during 2020-21. Out of 13,258 permits, 10,965 permits were issued for export of Indian origin Coffee and 2,293 permits were issued for re-export of imported Coffee after value addition.

Interactions with Exporters

Meetings with Coffee Exporters and Exporters Association/Specialty Coffee Association and line departments were held during the year. The meetings deliberated on resolving various stakeholders issues for achieving Coffee export target set by Government of India, Export Promotion Scheme, participation in the virtual international events, trade fairs, quality issues, financial assistance etc. All the relevant issues were taken up with the Ministry and line departments 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
b. Monthly report to the Ministry.
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 the export of Coffee 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 Coffee Board according to the Coffee Quality improvement programme 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

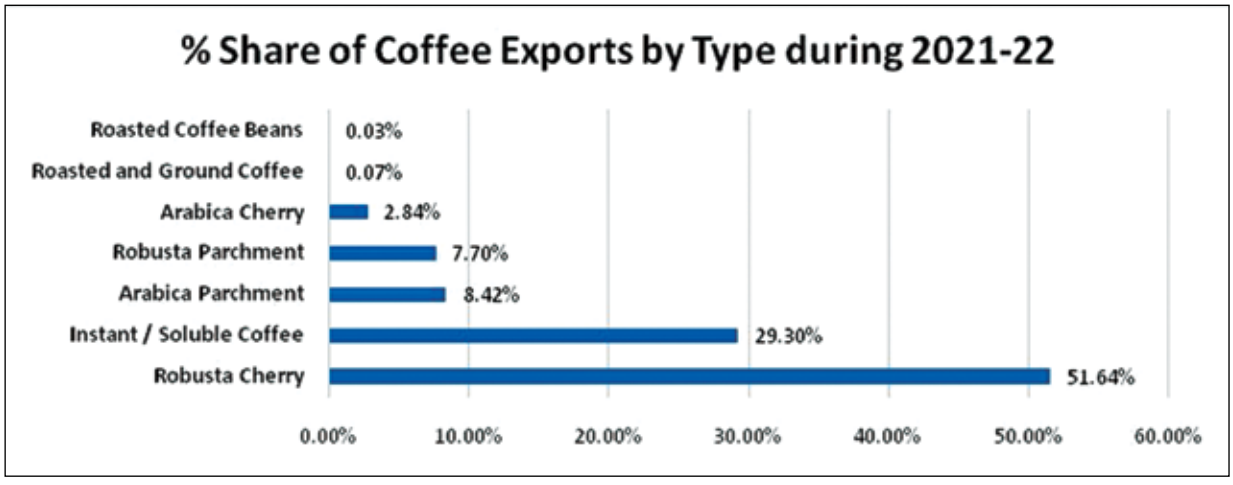
Coffee Exports

During 2021-22, India's Coffee Exports achieved a record level of USD 1033 million against the target of USD 1072 million set by the Government. Coffee exports recorded highest in both volume and value terms in 2021-22. During 2021-22, export permits for export of 4,16,247 tonnes of Coffee (including 93,972 tonnes of re-exports) were issued valued at ₹7,700 crores equivalent to US$ 1,033 million with a unit value of ₹2,46,464 per tonne (Equivalent to US$ 3,316 per tonne) During the year 2020-21, export permits were issued for export of Coffee to the tune of 3,10,692 tonnes of Coffee (including 77,390 tonnes of re-exports) valued at ₹5,452 crores equivalent to US$ 735 million with a unit value of ₹1,75,477 per tonne. During 2021-22, export permits were issued for the export of Coffee to 123 countries as against 125 countries in the previous year, out of which Italy, Germany, Belgium, Russian Federation and Jordan were the top five importing countries.

Types of Coffee Exports 2021-22* (Provisional)

TYPE OF COFFEE	Quantity in tonnes* (GBE)	Percentage to Total Exports
Arabica Parchment	35057	8.42%
Arabica Cherry	11810	2.84%
Robusta Parchment	32068	7.70%
Robusta Cherry	214953	51.64%
Roasted Coffee Beans	107	0.03%
Roasted and Ground Coffee	295	0.07%
Instant / Soluble Coffee	121957	29.30%
TOTAL	416247	100.00%

Note: Quantity in Green Bean Equivalent. *Based on export permit issued



Note: Quantity in Green Bean Equivalent. *Based on export permit issued

GRADE WISE DETAILS OF COFFEE EXPORTS -2021-2022*

(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	506	1230.07	16.62	242909	3282
2	ARABICA CHERRY-AA	351	990.62	13.28	282481	3787
3	ARABICA CHERRY-AB	3490	8279.27	111.31	237214	3189
4	ARABICA CHERRY-BULK	116	477.21	6.40	410991	5512
5	ARABICA CHERRY-C	846	1650.67	22.24	195143	2629
6	ARABICA CHERRY-PB	143	368.18	4.91	258079	3442
7	INSTANT COFFEE	121957	223340.13	2999.32	183130	2459
8	LIBERIA BULK	266	490.35	6.67	184635	2512
9	MON. MALABAR ARABICA-AAA	81	283.84	3.80	350420	4691
10	MON. MALABAR AR. TRIAGE	74	155.87	2.08	212068	2830
11	MON. MALABAR ARABICA-A	642	2015.50	27.14	314019	4228
12	MON. MALABAR ARABICA-AA	5562	18169.96	243.57	326681	4379
13	MON.MALABAR ROB-TRIAGE	4	5.56	0.08	139000	2000
14	MON.MALABAR ROBUSTA-AA	1794	4084.70	54.64	227738	3046
15	MYSORE NUGGETS-EB	3097	11433.60	153.15	369144	4945
16	PLANTATION-A	13319	45762.96	614.49	343580	4613
17	PLANTATION-AA	7539	26972.83	362.24	357761	4805
18	PLANTATION-B	6530	21122.15	283.11	323473	4336
19	PLANTATION-BULK	1715	6933.07	93.31	404358	5442
20	PLANTATION-C	2431	6147.02	82.81	252865	3406
21	PLANTATION-PB	425	1880.58	25.55	442248	6008
22	ROASTED & GROUND COFFEE	295	1021.41	13.71	346592	4652
23	ROASTED COFFEE SEEDS	107	533.39	7.17	499827	6719
24	ROBUSTA CHERRY AAA	8176	13163.29	176.46	160996	2158
25	ROBUSTA CHERRY-A	43988	68495.96	918.98	155715	2089
26	ROBUSTA CHERRY-AA	38665	63528.62	852.21	164305	2204
27	ROBUSTA CHERRY-AB	96065	148556.91	1990.04	154641	2072

Sl No.	Grade	Quantity (tonnes)	Value (₹Lakhs)	Value ($Lakhs)	Unit Value (₹/tonne)	Unit Value ($/tonne)
28	ROBUSTA CHERRY-BULK	5137	7291.76	98.21	141953	1912
29	ROBUSTA CHERRY-C	1120	1615.22	21.63	144193	1931
30	ROBUSTA CHERRY-PB	5714	8409.60	112.86	147173	1975
31	ROBUSTA CHY CLEAN BK.	14025	20539.82	274.72	146457	1959
32	ROBUSTA KAAPI ROYALE	8969	15219.45	204.49	169682	2280
33	ROBUSTA PARCHMENT-A	1227	2332.35	31.25	190045	2546
34	ROBUSTA PARCHMENT-AB	13669	23751.29	318.85	173762	2333
35	ROBUSTA PARCHMENT-C	1653	2626.38	35.25	158860	2132
36	ROBUSTA PARCHMENT-PB	2224	3543.09	47.42	159346	2133
37	ROBUSTA PMT.-BULK	4316	7506.21	100.86	173926	2337
38	ROBUSTA PMT.PB-BOLD	10	21.14	0.29	220208	3021
Total		**416247**	**769950**	**10331**	**246464**	**3316**

Note: Quantity in Green Bean Equivalent. *Based on export permit issued

COUNTRY WISE DETAILS OF COFFEE EXPORTS DURING 2021-22*

[Both Indian & Re-Exported Coffee]

Sl No.	Name of the Country	Quantity (tonnes)	Value (₹Lakhs)	Value ($Lakhs)
1	ITALY	76750	121626.72	1632.01
2	GERMANY	38057	73619.84	987.70
3	BELGIUM	29560	58970.66	792.61
4	RUSSIAN FEDERATION	24802	50379.09	678.29
5	JORDAN	17837	43766.55	586.15
6	TURKEY	15497	26712.52	357.64
7	POLAND	12790	19856.13	266.30
8	LIBYA	10799	17295.22	231.75
9	U.S.A.	10423	21813.51	292.39
10	TUNISIA	9849	16847.54	224.28
11	UNITED ARAB EMIRATES	9754	19193.46	256.83
12	MALAYSIA	8336	12497.88	167.45

Sl. No.	Name of the Country	Quantity in tonnes	Value (₹Lakhs)	Value ($Lakhs)
13	GREECE	7941	12711.03	170.79
14	ISRAEL	7222	12592.38	168.72
15	EGYPT	7139	12715.11	170.81
16	UKRAINE	6899	12154.27	163.58
17	AUSTRALIA	6865	14641.97	196.65
18	SPAIN	6619	10935.55	146.59
19	ALGERIA	6459	9521.97	127.62
20	KUWAIT	6032	18888.43	253.48
21	SYRIA	5900	9256.05	124.39
22	SAUDI ARABIA	5352	13140.39	176.34
23	KOREA REPUBLIC OF S	4948	9508.83	127.70
24	CROATIA	4660	7642.63	102.21
25	SLOVENIA	4609	6962.56	93.70
26	UNITED KINGDOM	4319	9132.09	122.49
27	VIETNAM	4246	5412.38	72.52
28	NETHERLANDS	2938	6074.08	81.22
29	MOROCCO	2890	4651.71	62.37
30	SWITZERLAND	2815	7509.05	100.86
31	INDONESIA	2738	4363.79	58.51
32	BANGLADESH	2455	4588.06	61.76
33	IRAN,ISLAMIC R/O	2450	4012.42	53.97
34	TAIWAN	2427	3553.09	47.73
35	IRAQ	2366	4302.73	57.82
36	BENIN	2294	4779.91	64.08
37	PORTUGAL	2280	3266.28	43.97
38	NIGERIA	1993	3649.90	49.20
39	MAURITANIA	1929	4715.70	63.45
40	MONTENEGRO	1783	2532.13	33.97
41	FRANCE	1627	3181.58	42.66
42	SENEGAL	1533	3607.57	48.45
43	LEBANON	1519	2663.91	35.56
44	ALBANIA	1425	2072.17	27.89
45	TOGO	1448	3229.91	43.32
46	SINGAPORE	1389	2721.21	36.46
47	NIGER	1367	2482.62	33.58
48	ROMANIA	1227	2009.75	26.86
49	LATVIA	1215	2009.67	27.09
50	MALI	1179	2361.12	31.63

Sl. No.	Name of the Country	Quantity in tonnes	Value (₹Lakhs)	Value ($Lakhs)
51	JAPAN	1130	3164.02	42.49
52	GHANA	1098	2703.67	36.20
53	NEPAL	1075	3792.34	50.96
54	IVORY COAST	1054	2238.11	30.02
55	CANADA	931	1783.83	23.93
56	BULGARIA	859	1612.61	21.76
57	GAMBIA	784	1708.48	22.99
58	CHINA,PEOPLE'S R/O	779	1380.32	18.51
59	MYANMAR	754	1070.30	14.38
60	FINLAND	634	1181.25	15.87
61	SRI LANKA	519	794.66	10.70
62	GEORGIA	517	1254.66	16.93
63	NEW ZEALAND	479	1197.57	16.08
64	UZBEKISTAN	466	682.45	9.14
65	GUINEA	451	1106.98	14.84
66	TURKMENISTAN	396	707.28	9.52
67	CONGO	360	834.65	11.18
68	CAMEROON	354	771.35	10.35
69	SULTANATE OF OMAN	341	635.18	8.59
70	ESTONIA	340	784.77	10.38
71	BURKINA FASO	325	593.67	8.05
72	IRELAND	262	464.13	6.24
73	ARMENIA	258	523.74	7.01
74	OMAN	240	445.83	6.01
75	KOSOVO	218	317.15	4.22
76	SOUTH AFRICA	191	358.20	4.78
77	KENYA	187	275.08	3.68
78	QATAR	177	549.83	7.37
79	GABON	150	301.78	4.06
80	NORWAY	143	449.77	6.07
81	EL SALVADOR	142	256.19	3.42
82	PERU	140	540.78	7.20
83	LITHUANIA	130	277.67	3.74
84	CYPRUS	129	202.60	2.72
85	ECUADOR	126	328.39	4.40
86	ARGENTINA	120	170.54	2.27
87	BRAZIL	91	136.50	1.82
88	CHAD	88	178.93	2.40
89	BAHRAIN	81	213.67	2.86

Sl. No.	Name of the Country	Quantity in tonnes	Value (₹Lakhs)	Value ($Lakhs)
90	SWEDEN	80	145.35	1.95
91	ANGOLA	66	159.81	2.14
92	BOTSWANA	63	86.61	1.18
93	KAZAKHSTAN	59	115.86	1.56
94	CENTRAL AFRICAN	57	152.14	2.04
95	EQUATORIAL GUINEA	54	121.01	1.64
96	BELARUS	37	74.72	1.01
97	AZERBAIJAN	35	56.22	0.75
98	SIERRA LEONE	31	48.13	0.65
99	AUSTRIA	31	134.97	1.82
100	TAJIKISTAN	31	58.80	0.79
101	BHUTAN	20	72.65	0.98
102	MONGOLIA	20	42.58	0.56
103	SLOVAKIA	20	32.83	0.44
104	ABU DHABI	19	60.83	0.83
105	LUXEMBOURG	19	95.73	1.28
106	MALDIVES	15	53.73	0.72
107	MOLDOVA	12	29.06	0.39
108	TANZANIA	11	42.31	0.56
109	FIJI	10	28.13	0.38
110	KIRIBATI	8.19	23.19	0.31
111	FRENCH POLYNESIA	48.03	107.64	1.44
112	CZECH REPUBLIC	7.08	24.80	0.33
113	TRINIDAD AND TOBAGO	6.77	20.05	0.27
114	GUAM	4.99	15.72	0.22
115	HONG KONG	3.12	8.17	0.11
116	DENMARK	2.66	7.71	0.11
117	BRUNEI DARUSSALAM	1.58	3.94	0.05
118	MEXICO	1.09	2.56	0.03
119	CAPE VERDE	0.62	1.40	0.02
120	SEYCHELLES	0.41	0.54	0.01
121	MAURITIUS	0.22	0.40	0.01
122	HUNGARY	0.10	0.35	0.000
123	CAMBODIA	0.07	0.07	0.000
Total		416247	769950	10331

Note: Quantity in Green Bean Equivalent. *Based on export permit issued

COUNTRY WISE DETAILS OF RE-EXPORTED COFFEE DURING 2021-22*

Sl. No.	Name of the Country	Quantity (tonnes)	Value (₹Lakhs)	Value ($Lakhs)
1	RUSSIAN FEDERATION	18060	37947.20	511.33
2	POLAND	10813	16510.90	221.58
3	U.S.A.	6361	12052.12	161.15
4	MALAYSIA	5283	7559.75	101.48
5	TURKEY	4809	6947.05	93.31
6	VIETNAM	3185	3896.51	52.23
7	UNITED ARAB EMIRATES	2947	5152.58	69.00
8	UKRAINE	2793	5242.79	70.56
9	INDONESIA	2738	4363.79	58.51
10	ITALY	2446	3560.01	47.74
11	BENIN	1895	3895.42	52.24
12	BANGLADESH	1869	3668.62	49.47
13	MAURITANIA	1679	4199.71	56.49
14	TAIWAN	1572	2264.54	30.40
15	SYRIA	1455	1722.54	23.22
16	GERMANY	1451	2450.16	32.65
17	IRAQ	1347	2205.16	29.71
18	UNITED KINGDOM	1334	2492.71	33.36
19	SWITZERLAND	1332	3580.15	48.29
20	NIGER	1197	2088.35	28.30
21	TOGO	1192	2700.73	36.21
22	NETHERLANDS	1179	1978.98	26.47
23	NIGERIA	1148	1938.65	26.18
24	ISRAEL	1130	1636.79	22.05
25	IVORY COAST	981	2083.09	27.96
26	BELGIUM	954	1525.99	20.46
27	SPAIN	906	1719.44	23.10
28	SINGAPORE	768	1388.21	18.59
29	JAPAN	592	1426.07	19.10
30	GAMBIA	542	1179.66	15.92
31	CHINA,PEOPLE'S R/O	477	791.39	10.58
32	SAUDI ARABIA	435	853.38	11.48

Sl. No.	Name of the Country	Quantity (tonnes)	Value (₹Lakhs)	Value ($Lakhs)
33	FINLAND	428	846.14	11.35
34	GHANA	424	937.99	12.57
35	LATVIA	416	779.75	10.52
36	AUSTRALIA	397	721.35	9.68
37	SENEGAL	394	924.31	12.38
38	ROMANIA	377	599.99	8.05
39	LIBYA	367	1108.59	14.91
40	TUNISIA	356	607.28	8.18
41	TURKMENISTAN	330	585.39	7.88
42	GUINEA	320	780.37	10.46
43	GEORGIA	317	897.68	12.17
44	MALI	308	572.88	7.68
45	JORDAN	287	429.63	5.73
46	KOREA REPUBLIC OF S	280	521.18	7.01
47	ESTONIA	243	585.11	7.72
48	UZBEKISTAN	231	329.49	4.43
49	CONGO	218	467.87	6.29
50	IRELAND	209	363.95	4.90
51	ARMENIA	199	389.73	5.19
52	BURKINA FASO	177	312.02	4.22
53	FRANCE	174	236.58	3.16
54	BULGARIA	158	271.38	3.68
55	GREECE	156	296.66	3.97
56	CAMEROON	156	377.65	5.04
57	KENYA	150	200.36	2.70
58	EL SALVADOR	142	256.19	3.42
59	PERU	140	540.78	7.20
60	CYPRUS	129	202.60	2.72
61	GABON	126	258.54	3.48
62	ECUADOR	126	328.39	4.40
63	NEPAL	114	318.96	4.31
64	MOROCCO	105	361.40	4.89
65	EGYPT	99	167.20	2.25
66	NEW ZEALAND	98	195.70	2.63
67	BRAZIL	91	136.50	1.82

Sl. No.	Name of the Country	Quantity (tonnes)	Value (₹Lakhs)	Value ($Lakhs)
68	LEBANON	82	157.60	2.11
69	SLOVENIA	61	125.28	1.67
70	BOTSWANA	60	79.15	1.08
71	KAZAKHSTAN	59	115.86	1.56
72	SOUTH AFRICA	58	106.30	1.42
73	ANGOLA	50	111.00	1.48
74	CROATIA	47	76.15	1.03
75	CENTRAL AFRICAN	47	127.70	1.72
76	SRI LANKA	37	74.73	1.00
77	ALGERIA	36	64.85	0.88
78	AZERBAIJAN	35	56.22	0.75
79	EQUATORIAL GUINEA	33	72.56	0.98
80	AUSTRIA	31	134.97	1.82
81	TAJIKISTAN	31	58.80	0.79
82	SIERRA LEONE	28	38.69	0.53
83	BELARUS	27	53.40	0.72
84	CHAD	22	56.14	0.76
85	SLOVAKIA	20	32.83	0.44
86	KOSOVO	18	34.53	0.46
87	MONGOLIA	15	32.83	0.43
88	TANZANIA	10	42.03	0.56
89	FIJI	10	28.13	0.38
90	FRENCH POLYNESIA	40	88.41	1.19
91	MALDIVES	4	9.60	0.13
92	CANADA	2	8.83	0.12
Total		**93972**	**169719**	**2280**

Note: Quantity in Green Bean Equivalent. *Based on export permit issued

TOP 10 COFFEE EXPORTERS DURING 2021-22*

(Both Indian & Re-Exported Coffee)

Sl. No.	Name of the Exporter	Quantity in tonnes	Value (₹Lakhs)	Value ($Lakhs)
1	CCL PRODUCTS INDIA LTD	38033	72509.79	974.15
2	EMIL TRADERS PVT LTD.	32434	49542.80	664.06
3	OLAM FOOD INGREDIENTS INDIA PRIVATE LIMITED	29102	63803.67	854.57
4	SUCDEN COFFEE INDIA PRIVATE LIMITED	28062	40867.64	549.33
5	ALLANASONS PRIVATE LIMITED	27899	60209.01	809.01
6	NKG INDIA COFFEE PRIVATE LIMITED	26938	41746.81	561.13
7	TATA COFFEE LTD	26731	58950.35	791.75
8	VIDYA HERBS PRIVATE LIMITED	22415	37790.56	503.76
9	LOUIS DREYFUS COMPANY INDIA PVT LTD	18270	34549.15	463.94
10	ECOM GILL COFFEE TRADING PVT.LTD.	18180	36431.90	489.03
	OTHERS	148183	273548.40	3670.38
Total		**416247**	**769950**	**10331**

Note: Quantity in Green Bean Equivalent. *Based on export permit issued

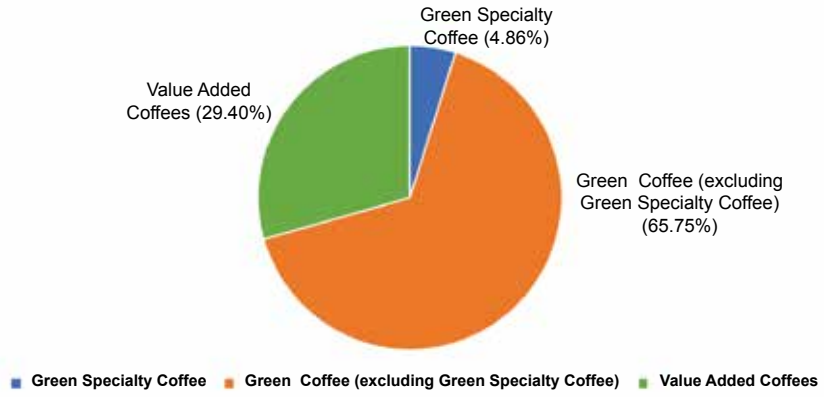
CATEGORY WISE COFFEE EXPORTS DURING 2021-2022*

(Both Indian & Re-Exported Coffee)

Sl. No.	Category of Coffee	Quantity in tonnes	Value (₹ Lakhs)	Value ($ Lakhs)
1	Green Coffee (Excluding Green Specialty Coffee)	20223	51368	689
2	Green Specialty Coffee	273665	493687	6622
3	Soluble, Roasted & Ground Coffee	122359	224895	3020
Total		**416247**	**769950**	**10331**

Note: Quantity in Green Bean Equivalent *Based on export permit issued

Percentage Share of Green Coffee, Specialty Coffee and Value Added Coffee during 2021-22*



*Based on export permit issued

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

The export promotion scheme for providing Transit/Freight assistance for Coffee Exports during Medium Term Framework (MTF) period is implemented w.e.f 13.07.2018 as per the modalities Notification No.MAR/EXPORTS/MTF/2018-19/499 dated 13.07.2018 and the same is hosted on Coffee Board's website. 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 far off destinations. The Export Incentives disbursed during 2021-22 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 Kg for Roasted Coffee seeds and Roast & Ground 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	4937	98.73
2	Incentive extended for export of Value Added Coffee in retail packs as India Brand at ₹3/-Kg	4143	124.29
	TOTAL	**9080**	**223.02**

Note: Quantity in Green Bean Equivalent

Logos for Branding of Indian Coffee

Coffee Board of India continued to promote the export of value added Coffees as India Brand 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 - Mother Logo

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 of India, Ministry of Commerce and Industry, Government of India, obtained Geographical Indications registration for seven Coffees, further it is facilitating authorized user registration of these Coffee by the stakeholders of the complete Coffee value chain.
- In this regard, eight applications of Authorised user registration of Board's Coffee farms were sent to the GI registry and registration certificates have been received. Three applications received from the stakeholders were processed for issuing no objection certificate, verified and the NoC is sent to GI registry and two applications have been received for Authorized user registration of Geographical indication tagged Chikmagalur Arabica Coffee and processing of the same is underway.
- Additionally, a Coffee Cupping Session and a presentation on the steps for Authorized User Registration for Geographical Indication (GI tagged) Coorg Arabica Coffee was conducted on 25th February 2022 at Coffee Board Technical Evaluation Centre (TEC), Gonikoppal.
- Received Ten authorized user registration certificates for Geographical Indications (GI) tagged Coffees from the Registry and sent to GI beneficiaries.

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 underway.

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.,
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.
6. To create awareness and promote India Coffee, Board involved in Digital Media campaign through Facebook, Twitter and Instagram.

During 2021-22 due to global COVID-19 pandemic, the Coffee Board did not participate in any of the physical events for export promotion. However, the Coffee Board made systemic efforts to collaborate with Indian Missions abroad to promote Indian Coffees in the importing countries by organizing promotional programmes *viz.,* Coffee tasting sessions on Indian Coffees, participation in virtual Coffee festivals and organising virtual buyer seller meets. During the year 2021-22, the following programmes were organized virtually;

Sl. No.	Name of the Event & Country	Date of event
1	Embassy of India in Buenos Aires, Argentina in collaboration with Coffee Board organized “Indian Coffee Tasting Session” at Buenos Aires.	27th August, 2021
2	Embassy of India in Hague, The Netherlands in collaboration with Coffee Board organized “Indian Coffee Tasting Session” in the Annual Embassy Festival.	4th& 5th September, 2021
3	Coffee Board in collaboration with High Commission of India in Singapore, Singapore Coffee Association and Enterprise Singapore organized virtual Business Network meet on Coffees of India.	17th September, 2021
4	Coffee Board in collaboration with Embassy of India, Rome, Italy organized virtual Business Network meet on Coffees of India.	21st September, 2021
5	Coffee Board in collaboration with Consulate General of India, Guangzhou, China organized virtual Business Network meet on Coffees of India.	28th September, 2021

6	Consulate General of India, Frankfurt, Germany in collaboration with Coffee Board promoted Coffees of India by organizing "Indian Coffee Tasting Session" during Frankfurt Coffee Festival held at Halle, Germany.	1st October, 2021
7	Embassy of India, Brussels, Belgium in collaboration with Coffee Board organized "Indian Coffee Tasting Session" at Brussels.	5th October, 2021
8	Coffee Board in collaboration with Embassy of India, Cairo, Egypt organized virtual Business Network meet on Coffees of India.	12th October, 2021
9	Coffee Board in collaboration with Embassy of India, Thimphu, Bhutan organized virtual Business Network meet on Coffees of India.	25th November, 2021
10	Coffee Board in collaboration with Embassy of India, Moscow, Russia organized virtual Business Network meet on Coffees of India.	30th March, 2022

These virtual trade promotion events acted as an alternative platform for interaction between buyers / sellers, exploring marketing opportunities, connecting with target audiences for increased Coffee exports. Efforts were made for large-scale participation of Indian Coffee exporters and specialty Coffee growers in all these events. Further, Coffee Board continued to send corporate gift boxes containing high quality GI Coffees for giving away to VIPs and dignitaries through Indian Missions in important Coffee importing countries for promotion of Indian Coffees.

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CHAPTER – VIII

MARKET RESEARCH & INTELLIGENCE

The Market Research & Intelligence Unit of the Coffee Board dealt with the following assignments during 2021-2022.

- The Unit continued to collect and compiled daily market information (both global pertaining to 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 2021-2022, a total of 183 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 July 2021 and January 2022. 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 2021-2022.
  - Post-Blossom estimate for 2021-22 was placed at 3,69,000 tonnes (Arabica 1,08,300 tonnes and Robusta 2,60,700 tonnes).
  - Post-monsoon estimates for 2021-2022 was placed at 3,48,500 tonnes (Arabica 99,000 tonnes and Robusta 2,49,500 tonnes).
  - The final estimate for 2021-2022 is placed at 3,42,000 tonnes comprising of 95,000 tonnes of Arabica (28% of total) and 2,47,000 tonnes of Robusta (72% of total).
- 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 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 Unit has provided the requisite inputs w.r.t Coffee to Karnataka State Agricultural Produce Processing and Export Corporation Limited (KAPPEC), the State nodal agency for the implementation

of One District One Product (ODOP) scheme.

- The activities of the Export Section were coordinated by the unit.
- Based on the inputs provided by the exporters, the Unit has worked out the embodied 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 has involved in organizing two 'VIKRAYAM' incubation Programme during October to November 2021 and February to March 2022 to create a platform for the Coffee growers and entrepreneurs for the direct exports without many intermediaries.
- The Unit provided weekly estimated indicator prices for all the grades of Coffee to domestic auction centre, Indian Coffee Trade Association (ICTA).
- The Unit continued to be involved in the maintenance of the Coffee Board's website https//www.indiacoffee.org.
- The monthly "market watch" column in 'Indian Coffee' magazine was contributed by the unit.

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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 2021-22 and the provisional expenditure under each head of account is given below:

(₹ in crores)

Head of Grant	Grants Received	Expenditure Incurred	Remarks
Grants-in-aid - General (ONER)	11.00	11.00	
Creation of Capital Assets - Plan (ONER)	0.50	0.50	
Subsidies (ONER) Plantation	7.70	7.70	
Subsidies - S.C. Sub-Plan	0.82	0.50	0.32*
Subsidies - Tribal Area Sub Plan	4.95	4.95	
Swachhta Action Plan - SAP	0.80	0.80	
Creation of Capital Assets - NER	0.50	0.50	
Subsidies - NER	2.00	2.00	
Grants-in-aid - General - NER	5.69	5.69	
Grants-in-aid - Salary.	124.81	124.81	
Grants-in-aid - General	6.11	6.11	
Grand Total	**164.89**	**164.57**	

Refunds * SC Sub plan Subsidy – ₹32.50 lakh refunded to Government of India

Pension

The Pension Corpus of ₹26.19 crore (₹26,19,18,359/-) has been deposited as of 31.03.2022 in Nationalized Banks for earning interest. Total interest earned during the year was ₹1.43 crore (₹1,43,46,487/-). Pension payments to 2782 pensioners and pensionary benefits to those who have retired during the financial Year 2021-22 have been paid.

There are 189 employees in New Pension Scheme as of 31.03.2022 who joined the services of the Coffee Board after 01.01.2004.

Provident Fund

During the year, a sum of ₹6.78 crore (₹6,78,17,990/-) has been received as Provident Fund Subscription and refund of Provident Fund advances and a sum of ₹8.87 crore (₹8,87,29,102/-) has been disbursed as advance / partial final withdrawals and final settlement of PF. Surplus fund of ₹35.00 crore has been deposited in various nationalized Banks as per Coffee Act, 1942 and earned an interest of ₹1.91 crore (₹1,91,70,655/-) 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 ₹8.25 crore has been deposited in Indian Overseas Bank, Cantonment Branch, Bengaluru.

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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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