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ICFRE – TFRI NEWSLETTER

October, 2023- March, 2024

From the Director's Desk

I am pleased to mention that ICFRE-TFRI, Jabalpur is one of the nine regional institutes under the ICFRE to provide strong research support for sustainable development of forests and forestry sectors in central India.

I take pride in sharing the 12th and 13th issue (October,2023 - March,2024) of ICFRE-TFRI Newsletter, showcasing significant research activities, events organized, participated and publications made during the period.

I hope this newsletter will be helpful for researchers, different stakeholders, and policy makers concerned with forestry research.

Dr. H. S. Ginwal
Director, ICFRE-TFRI Jabalpur

Contents

Major Events

32nd Research Advisory Group Meeting

ICFRE- Tropical Forest Research Institute, Jabalpur conducted 32nd Research Advisory Group meeting via online mode on 9th October 2023 to assess newly proposed projects and to discuss progress of ongoing forestry research projects.

The projects were assessed by the core members including authorities from the State Forest Department of Madhya Pradesh, Chhattisgarh & Maharashtra, academicians, subject experts, progressive farmers and other stakeholders.

Dr. H.S. Ginwal, Director, TFRI briefed the RAG members about the background of this annual meeting and the process of evaluation of the research projects. He provided an update on significant achievements of the institute in various sectors including Forest Genetics, Pest and Diseases, Agroforestry, Silviculture, Ecology, Climate Change and extension activities of the institute.

The four new proposals included projects on (i) Medicinal plants for water purification, (ii) Drivers of environmental degradation on Narmada river (iii) Seed studies and conservation status of Maloo creeper and (iv) Cytogenetical assessment of Salai gum for enhancing fruiting and propagation techniques were presented.

Smt. Neelu Singh, Group Coordinator (Research), TFRI Jabalpur presented in detail the origin, infrastructural facilities, financial outlay and research activities conducted by the institute.

Additionally, a technical bulletin on "Candidate Plus Trees of Teak (*Tectona grandis*) selected in Central India" was also released by the dignitaries during the meeting.

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Establishment of VVK, Chandrapur

ICFRE - Tropical Forest Research Institute Jabalpur established a new Van Vigyan Kendra at Chandrapur, Forest Academy, Maharashtra on 22-03-2024, under CAMPA Extension program. Dr. H.S. Ginwal, Director, TFRI and Shri M. Srinivasan Reddy, IFS, Director, Chandrapur Forest Academy signed MoU for this purpose. Dr. Ginwal, highlighted extension activities of ICFRE and expressed interest in further collaboration with the academy. Shri Reddy expressed overwhelming gratitude for the establishment of the VVK and briefed about activities of academy. Dr. Nanita Berry, Head Extension Division presented the objectives of CAMPA, Extension scheme and VVKs achievements in Central India.

Establishment of New VVK at Chandrapur Forest Academy

Memorandum of Understanding

ICFRE - Tropical Forest Research Institute, Jabalpur signed "Non - Exclusive License Agreement" with M/s Mukund Biotech, Jabalpur on 20th March 2024, for the tissue culture mass multiplication of one clone of Teak and one selected Candidate Plus Clumps (CPC) of Bamboo (*B .balcooa*). The agreement was signed by Dr. H. S. Ginwal, Director, ICFRE-TFRI and Shri Deepak Agrawal, Director, M/s Mukund Biotech. The germplasm was tested and evaluated by Dr. Fatima Shirin, Scientist-G and her team. On this occasion, Director ICFRE-TFRI emphasized the importance of Public Private Participation. The agreement will give access of improved planting material (including teak and bamboo) developed through years of R&D at the institute to M/S Mukund Biotech for mass multiplication and extension of its outreach to forest departments, tree growers, farmers, common public and society.

Scientist's Corner

Establishment of Field Gene Bank of economically important and RET species for FGR conservation at KVK, Katni, Madhya Pradesh

For the conservation of Forest Genetic Resources (FGR) of valuable and endangered forestry species from central Indian region, a Field Gene Bank was established at Krishi Vigyan Kendra, Katni, Madhya Pradesh. Seed raised plants of *Haldina cordifolia* (Haldu), *Syzygium cumini* (Jamun), *Litsea glutinosa* (Maida chaal), *Ailanthus excelsa* (Maha neem), *Careya arborea* (Kumbhi), from different populations of Madhya Pradesh, Chhattisgarh and Maharashtra were planted in the form of Field Gene Bank with the objective of domestication and conservation.

Layout and land preparation for plantation at KVK Katni, Madhya Pradesh

Field planting of different species at KVK, Katni, Madhya Pradesh

Survey and Collection of Germplasm of Important FGRs for their Conservation

Forest genetic resources are the heritable materials maintained within and among populations for trees and other woody plant species (shrubs, climbers, palms and bamboo) that are of actual or potential economic, environmental, scientific or societal

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value. Field surveys were conducted in various locations of forest division's viz., Korea, Manendragarh, Pratappur, Surajpur, Marwahi, Bhanupratappur, Kondagaon, Kanker and Dhamtari of Chhattisgarh and Anuppur, Satna and Shahdol of Madhya Pradesh to identify promising and diverse seed sources of prioritized species. Fruits of *Listea glutinosa* from 34 seed sources and *Carissa carandus* from 13 seed sources were collected.

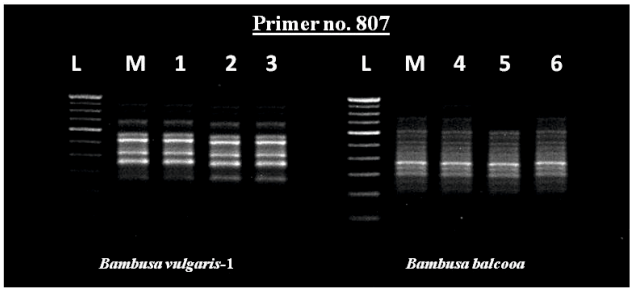
Selected seed source of *Litsea glutinosa*

Collected fruits and seeds of *L. glutinosa*

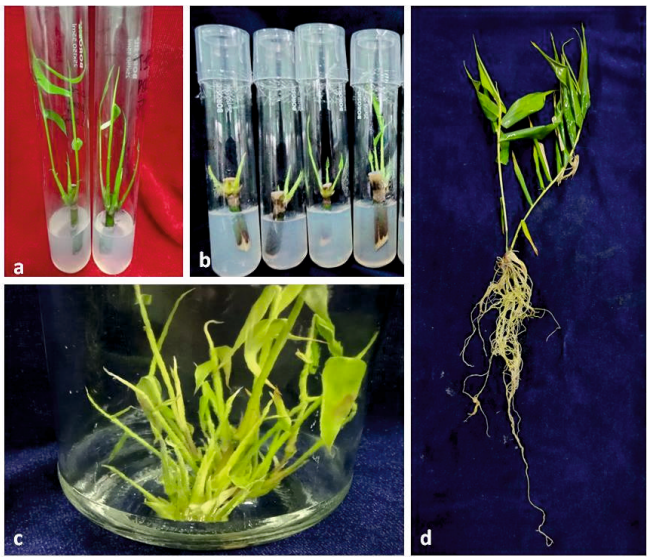
Selected seed source and collected fruits and seeds of *Carissa carandus*

Development of value chain for bamboos for mass multiplication, popularization in farmer's field and industrial linkage in central India.

Clonal fidelity testing was conducted on five bamboo species viz,. *Bambusa balcooa, B. tulda, B. nutans, B. vulgaris* var. green and *Psuedoxytenanthera stocksii* using ISSR primers. Experiments were carried out to study the effect of eight different concentrations of TDZ on in-vitro culture establishment through nodal segments and effect of different auxins viz., NAA, IAA, IBA, IPA, coumarin, phloroglucinol, picloram and β-Napthoxyacetic acid on in-vitro rooting of *Pseudoxytenanthera stocksii*. Maximum number of shoots (4.27) was observed in MS media supplemented with 1 mgL-1 TDZ, and maximum number of leaves (3.18) was recorded with 0.5 mgL^{-1}TDZ. Maximum rooting percentage (33%) was achieved in semi-solid MS media fortified with 10 mgL-1coumarin and phloroglucinol. In *P. stocksii* treated, highest rooting percentage (54.87%) was observed in culm cuttings treated with 2000 ppm NAA, while maximum rooting percentage (47.25%) was obtained in culm branch cuttings with 2000 ppm NAA treatment. In terms of root development, culm cuttings exhibited the highest number of roots (12.78) and the longest root length (10.54 cm).On the other hand, culm branch cuttings had the highest number of roots (9.67) and the maximum root length (8.43 cm). Morphometric data for species trial of six bamboo species viz., *B. tulda, B. nutans, B. vulgaris, B. balcooa, B. bambos* and *D. strictus* established at Kundam and ICFRE-TFRI, Jabalpur were recorded. In Kundam trial, maximum culm height (3.09 m) and maximum number of culms (5.98) was observed in *B. bambos* (MAN-CL-2), whereas, maximum culm diameter (2.61 cm) was recorded in *B. vulgaris* (RAI-CL-1). In trial established at TFRI campus, maximum culm height (5.82 m) in *B. balcooa* (BOT-CL-1), maximum number of culms (6.93) in *D. strictus* (BAL-CL-4) and maximum culm diameter (4.94 cm) in *B. nutans* (GEN-CL-1) were recorded.



Clonal Fidelity testing of B. vulgaris and B. balcooa clones
(L=Ladder, M=Mother plant)



Micropropagation of *Pseudoxytenanthera stocksii*: a), b) Bud initiation
c) Shoot multiplication; d) In vitro rooting

Dr. Fatima Shirin, Scientist-G

Development of Novel g-SSR markers in Chironji (*Buchnania cochinchinensis*): a socio-economically important non-timber forest species

Buchanania cochinchinensis (Lour.) Almeda. belongs to Anacardiaceae family and commonly known as chironji / char in Central India. It is high value wild fruit plant and has very high potential to become a commercial horticulture species. Unlike, other member of Anacardiaceae family, genomic information is not available in this species except few molecular studies. Recognizing the research gap, shallow genome sequencing was carried out for development of microsatellite marker. Utilizing Illumina platform, 6.29 GB high-quality data was generated. Primer validation revealed an average expected heterozygosity of 0.494, polymorphic information content of 0.373, Nei's gene diversity of 0.245,

and Shannon's information index of 0.395. Microsatellite markers generated in this study represent a valuable genomic resource for effective utilization in characterizing Buchanania germplasm.

Table: SSR identification statistics

Description	Value
Total number of scaffolds examined	183,201
Total size of examined sequences (bp)	225,895,093
Total number of identified SSRs	36,584
Number of SSR containing sequences	26,922
2 (di-nucleotide repeats)	9,653
3 (tri-nucleotide repeats)	23,789
4 (tetra-nucleotide repeats)	2,634
5 (penta-nucleotide repeats)	401
6 (hexa-nucleotide repeats)	107
No of filtered SSRs	20,740

Sh. Ankur Dahayat, Ph.D.Scholar and Dr. Naseer Mohammad, Scientist-E

Introduction and evaluation of *Melia dubia* in Central India

Evaluation trials of *Melia dubia* have been established in five sites (Morena, Chhindwara, Nagpur, Amravati and Durg) by planting 50 improved varieties/genotypes with three replications in a randomized block design. Eight genotypes performed better in terms of height and collar diameter across all test sites, however these genotypes need further evaluation for site specific recommendation.

A view of *Melia dubia* experimental site

Dr. Naseer Mohammad, Scientist-E

Collection of different genotypes of *Withania somnifera* across India

Ashwagandha (*Withania somnifera*) belongs to the family Solanaceae is commonly known as "Indian Winter cherry" or "Indian Ginseng". This plant possesses pharmacological properties such as antimicrobial, antiinflammatory, antistress, antitumor, neuroprotective, and many more for use in various treatments. Germplasm of Ashwagandha was collected from various locations of the country i.e. Amarkantak and Mandla (Madhya Pradesh), Bilaspur (Chhattisgarh), Dehradun (Uttarakhand), Shimla (Himachal Pradesh), Nagpur (Maharashtra) and Varanasi (Uttar Pradesh) for their evaluation and characterization in India.

Ashwagandha Plants at GTI's Nursery

Selection and Evaluation of *Haldina cordifolia* (Haldu) for Higher Wood Productivity

Thirty Candidate Plus Trees (CPTs) of *Haldina cordifolia* were marked after extensive surveys in three states of Central India i.e. Madhya Pradesh, Maharashtra, and Chhattisgarh. Progenies of these CPTs were raised and two progeny trials were established at Jagmandal Range, Mandla, Madhya Pradesh, and at Guru Ghasidas Vishwavidyalaya, Bilaspur, Chhattisgarh in July 2023. The height of *H. cordifolia* seedlings raised in polybags ranges from 80 cm to 120 cm, and their diameter ranges from 8 to 13 cm after one year of growth.

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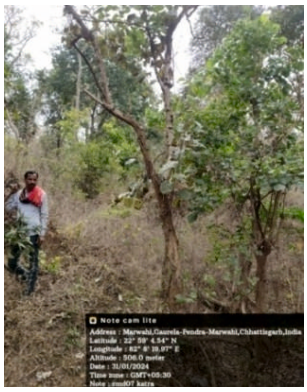
Plantations of *H. cordifolia* at Mandla (A), and Bilaspur (B)

Shri Nikhil Verma, Scientist-B

Assessment of variability in Populations of *Cordia macleodii* (Dahiman) and its Conservation in Chhattisgarh

Dahiman (*Cordia macleodii*) is an important endemic, critically endangered ethnomedicinal plant of central India. The extensive field surveys were conducted in twelve forest divisions of Chhattisgarh viz., Pendra-Marvahi, Bilaspur, Koria, Sarguja, Raigarh, Bastar, Dhamtari, Baloda Bajar etc., and geotagging of 125 trees were done to assess biochemical and morphological variations. A Macro propagation experiment was conducted on the stem cutting with three different concentrations of IBA viz., 500 ppm, 1000 ppm and 1500 ppm. It has been reported that saponins content in the leaves (2-3%), whereas in the bark 4-5%. Other secondary metabolites viz., flavonoids and phenolic content have variation with respective of agro-eco- climatic zones in Chhatisgarh.



Dahiman's natural condition in the forest area of Chhattisgarh

Dr. Kaushal Tripathi, Scientist-B

How does soil moisture affect the growth of *Pterocarpus marsupium* seedlings?

Soil moisture plays a critical role in the growth of seedlings such as root development, water and nutrient uptake, temperature regulation,etc. The Effect of soil moisture changes measured through morphological parameters of seedlings involves observing the physical characteristics of the seedlings. The key parameters for the effect of moisture changes in seedlings indicated by leaf wilting, leaf color, stem and leaf turgidity, root growth, shoot elongation, leaf droop angle, and leaf surface temperature. During the study, it was observed that due to inadequate soil moisture, *Pterocarpus marsupium* seedling leaves turned yellow or brown drying of leaves from edges, indicating the symptoms of water stress conditions in the field. During the observation period (post-monsoon season (Oct.–Jan.)) irrigation was not provided to plants. The formation of small cracks in the soil also indicated the moisture stress in the plantation area. Over 90% of the plants survived in the field. However seedling height and growth were very slow during this period (2–8 cm) and chlorophyll content in leaves decreased due to moisture stress. Therefore, throughout the establishment phases of seedlings in the plantation, morphological parameters (leaf colour, height, and growth) may be considered key indicators of soil moisture regimes. This will help in understanding the irrigation requirement and deciding the interval of irrigation for plants in field conditions.

Pterocarpus marsupium seedlings growth during the October 2023

Pterocarpus marsupium seedlings growth during the January 2024

Development of multitier agroforestry systems in selected agroclimatic zones of Madhya Pradesh

Documented the existing agroforestry models in different agroclimatic zones of Madhya Pradesh based on secondary literature.

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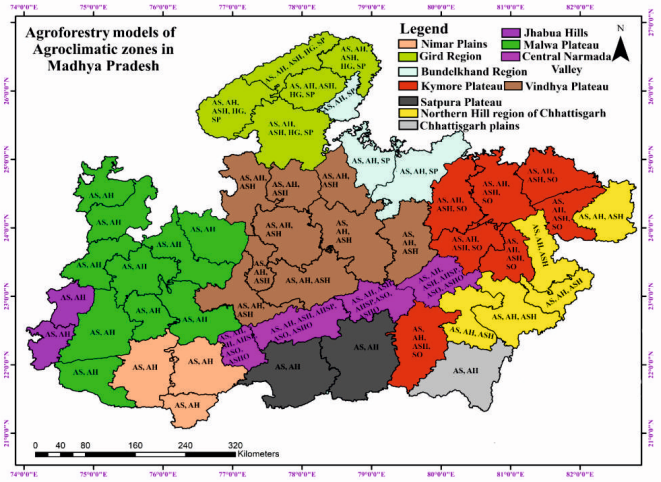


Agroforestry models under agroclimatic zones in Madhya Pradesh (AS = Agri-Silviculture, AH = Agri-Horticulture, ASH = Agri-Silvi-Horticulture, SO = Silvi-Olericulture, AHSP = Agri-Horti-Silvi-Pasture, ASO = Agri-Silvi-Olericulture, ASHO = Agri-Silvi-Horti-Olericulture, HG = Home-Garden, SP = Silvi-Pasture).

Shri Digvijay Singh, Scientist-B

Standardization of propagation protocol for wild fruit species *Flacourtia indica* (Kakai) and *Semecarpus anacardium* (Bhilwa)

Macro propagation experiments were conducted on challenging-to-root wild fruit species, *Flacourtia indica* and *Semecarpus anacardium*, utilizing stem cutting and air layering techniques, respectively. These methods were implemented with the aid of a cost-effective non-mist propagator. Initial findings suggest that a 1000 ppm IBA basal treatment for 24 hours enhances root formation in *Flacourtia indica*, whereas a combination of soil and 1000 ppm IBA applied to air-layered branches demonstrates encouraging outcomes for root induction in *Semecarpus anacardium*.

Seed pre-treatment standardization in a vulnerable tree species *Cochlospermum Gossypium* (Gabdi) of Central India

The seed pretreatment protocol for *Cochlospermum gossypium*, a rare tree species native to Central India, underwent standardization. The most effective treatment entailed a 24-hour exposure to 500 ppm GA3, leading to a notable enhancement in germination rates, reaching up to 40% as opposed to the control group, which only achieved a 15% germination rate.

Albino seedlings in *Pterospermum acerifolium* (Kanakchampa)

Albino seedlings were observed in the nursery of *Pterospermum acerifolium*. Albino seedlings lack chlorophyll, essential for photosynthesis. Causes can stem from genetic mutations or environmental stressors such as insufficient light, nutrient deficiencies or pathogenic factors.

Shri Manish Kumar Vijay, Scientist-B

Assessment of drivers for mortality in Sal saplings planted on coal mine overburden dumps

Scientists of ICFRE-TFRI visited NCL Singrauli to detect drivers for mortality in Sal saplings planted on coal mine overburden dumps. The plantations have been raised by Madhya Pradesh Rajya Van Vikas Nigam Ltd. (MPRVVN) as part of MOU signed between MoEFCC and NCL.

Scientists had in detail discussion with the officers of MPRVVN and NCL, visited the plantation site, and collected soil & plant samples. Recommendations were given to Madhya Pradesh Rajya Van Vikas Nigam Limited (MPRVVN) for improving the success rate of existing Sal plantations and establishing new ones on OB dumps at Northern Coalfields Limited (NCL).

Collection of infected leaf samples by plant pathologist

Dr. Avinash Jain, Scientist-F

Biotization with plant growth promoting rhizosphere and endophytic bacteria for management of nursery diseases of micro propagated bamboo and teak.

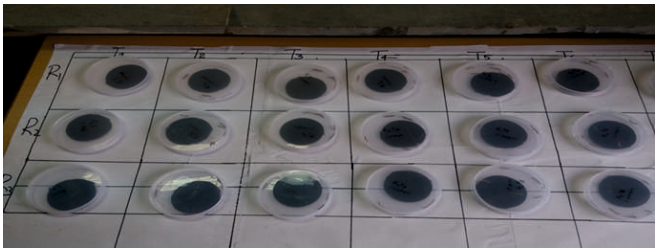
Rhizosphere bacterial isolates (20) were isolated and purified from different divisions of Madhya Pradesh (Mandla, Khandwa, Ujjain, Sagar, Jhabua, Pachmari and Damoh (Tejgarh) division). In vitro screening work is being initiated for selection of the potential plant growth promoting rhizosphere (PGPR) strains for management of nursery diseases of micropropagated bamboo and teak.

Collection and isolation of Rhizosphere bacteria from different division of Madhya Pradesh

Dr. Darshan K., Scientist- B

Development of Nanoformulation of *Cleistanthus collinus* leaf extract for Management of major Defoliator Pests of Teak and Gmelina.

Bioassay experiments were conducted to test the insecticidal effect of different concentrations of *C. collinus* leaf extractives. The results showed that larval mortality of teak skeletonizer, defoliator and Gmelina leaf webber at a concentration of 2.5% after 72 hours of treatment were 80%, 73.33% and 86.6% respectively.



Leaf-disc bioassay of *C. collinus* leaf extract against Teak defoliator and skeletonizer under laboratory condition

Dr. Mohan C., Scientist- B

Exploration and utilization of natural forest resources for formulation of mosquito repellents and their evaluation.

Herbal Mosquito repellent liquids, creams, larvicide and sprays were developed. Herbal mosquito repellent liquid formulations were optimized and tested for mosquito repellent activity, knock down and mortality. Four formulations were found effective and formulate containing species *Lantana camara, Hyptissuaveolens, Chloroxylon swietenia, Murraya koenigii* and *Andrographis paniculata* resulted in 72-92% knockdown and mortality of mosquitoes. All the developed cream samples complied as per IS 6608:2004 specifications for the tested parameters viz. pH, thermal stability, total fatty substance content, total residue, heavy metals and microbial content.

Herbal mosquito repellent vaporizers and larvicidals

Herbal mosquito repellent sprays

Mosquito repellent creams

Dr. Vishakha Kumbhare, Scientist-F

Short Scientific Visit of Senior Research Scientist, Kenya Forestry Research Institute, Nairobi- Kenya under IUFRO

International fellow Dr. Magrate Kaigongi, Senior Research Scientist, Kenya Forestry Research Institute, Nairobi- Kenya under IUFRO grant short scientific visit and developed joint project "Implication of geographical difference on phytochemical constituents, in vitro antioxidant, acetylcholinesterase-inhibitory and antiproliferative properties of *Carissa spinarum* L. from India and Kenya" (5th February 2024 to 25th March 2024) ,under the mentorship of Smt. Neelu Singh, Scientist-G, Group Coordinate (Research).

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Training and Capacity Building

Scientists of ICFRE-TFRI provided training on 1.12.2023-2.12.2023 to 117 forest officers of Chhattisgarh Forest Department, Forest Circle Raipur, regarding estimating the volume of timber obtained using the new form factor developed by ICFRE-Tropical Forest Research Institute, Jabalpur.

ICFRE- Tropical Forest Research Institute, Jabalpur organized a five-days training program on bamboo handicrafts for 22 women tribals under the BTSG scheme of the National Bamboo Mission from 18 to 22 December 2023. During the training, skills of value addition through bamboo flowers, lamps, clips and artwork were taught. On this occasion, Dr. Harish Singh Ginwal, Director encouraged women to increase their income through this skill.

ICFRE - Tropical Forest Research Institute, Jabalpur organized a three days workshop cum training on **"Soil test-based nutrient management practices"** from 31st January to 2nd February, 2024. During the training, forest officers from 15 divisions and 110 ranges of Madhya Pradesh trained to efficiently balance soil nutrients for optimum productivity and yield of forestry species. The workshop was conducted under the All India Co-ordinate Research Project for **"Preparation of forest Soil Health Cards under different forest vegetation in all forest divisions of India"**.

In the Inaugural session, Shri Aseem Shrivastava, IFS, PCCF, HoFF, Madhya Pradesh and Smt. Kanchan Devi, IFS, Director General, Indian Council of Forestry Research and Education (ICFRE) interacted with the participants. Dr. Vijendra Panwar, National Project Coordinator; Dr. H. S. Ginwal, Director ICFRE-TFRI, Shri Pradeep Vasudeva, Director, SFRI; Shri. S.K. Singh, Director Kanha National Park; Shri Ravindra Mani Tripathi, Deputy Director SFRI and Dr. Avinash Jain, Scientist & Head Forest Ecology and Climate Change Division, ICFRE-TFRI were present in the event. The participants received training on the methodology for collection of forest soil for preparation of SHC, management of nutrients and application of optimum level of fertilizers in the soil of Madhya Pradesh. They also learned about the application of biofertilizers for sustainable management of forests and use of SHC in increasing productivity of forests of Madhya Pradesh during the training.

Training for IFS Officers

To understand the importance of trees outside the forests and to increase the green cover of the country and to achieve the national target of 33% forest cover, (ICFRE) - Tropical Forest Research Institute, Jabalpur conducted 3-days (13th-15th February 2024) training workshop program for Indian Forest Service (IFS) officers on **"Agroforestry Model and its Management for Livelihood Security"** sponsored by Ministry of Environment, Forest & Climate Change, Government of India. Smt. Kanchan Devi, IFS, Director General, Indian Council of Forestry Research and Education (ICFRE) virtually inaugurated the training program. Dr. H.S. Ginwal, Director, ICFRE-TFRI and Dr. Nainita Berry, Course Director shared information about agroforestry and workshop activities.

Subject matter experts namely Dr. P.C. Dubey, IFS, former PCCF, Madhya Pradesh, currently Chairman SCAS-MP Govt.; Dr. Ramesh Chand Dhiman, Consultant Sustainable Agroforestry Initiatives and Greenlam Industries Limited, Delhi and Dr. Shyam Vishwanath, Former Director, KFRI, Peachey delivered the lectures and interacted with the participants. A course book and documentary on "Agroforestry – Improved Land Use Practices" was also released by the dignitaries. IFS officers from Uttar Pradesh, Maharashtra, Uttarakhand and Karnataka participated in this training.

ICFRE-TFRI organized three days training on **"Use of flyash in forestry sector in view of climate change and land degradation"**, from February 21st to 23rd, 2024. Shri R.N. Shukla, Head Environment and Forest, Adani Corporate House, Ahmedabad along with 17 other officers from thermal power plants and associate offices of Adani Power from across the country attended the training. Dr. H.S. Ginwal, Director TFRI emphasized that the major industries of the country are the stakeholders of the institute and the scientists of the institute can play a significant role in addressing their issues. Dr. Avinash Jain, Course Coordinator apprised the participants that the country's first fly-ash research park is going to be established at Adani Power Limited, Gondia in consultation with ICFRE-TFRI, Jabalpur. The training program was appreciated by the entire team of Adani executives and industrial environment managers.

Live demonstrations on Charcoal making from weeds and Mushroom cultivation were organized on 29th Feb 2024 at Banjari, Demo village, Seoni under the CAMPA extension program of ICFRE. The aim was to disseminate low cost technology among the forest officials and women SHGs. Process of charcoal making was explained by Smt. Neelu Singh, GCR, ICFRE - Tropical Forest Research Institute, Jabalpur. Shri Gopal Singh, SDO emphasized the need for new technology to start ventures with Van Dhan Kendra, Seoni to popularize TFRI products.

A One week training (11th to 15th March, 2024) on Propagation of RET and Economically Important Forestry Species along with Hi-Tech Nursery Techniques was inaugurated at ICFRE-Tropical Forest Research Institute, Jabalpur for 20 front line staff involved in nursery management from Chhattisgarh State Forest Department. Mrs. Neelu Singh, Group Coordinator Research emphasized the significance of training in raising quality planting material. Dr. Fatima Shirin, Training Coordinator and Scientist-G, briefed about raising RET and economically important forestry species and their management in nursery. All the Heads of Divisions, scientists, officers and research scholars of the institute also attended the inaugural program.

Under the joint auspices of CAMPA, Chhattisgarh Project, and ICFRE - Tropical Forest Research Institute, Jabalpur, provided a one-day training session on "Plantation and Management of Valuable Tree Species" to over 70 forest officers of Bilaspur and Durg forest circles. The training was organized on March 12th and 13th, 2024. Dr. Nanita Berry, Scientist-F, Sh. Digvijay Rathore, Scientist-B, and Dr. Darshan, Scientist-B from TFRI delivered lecture to the participants. Sh. Rajesh Chandele, Chief Forest Conservator, Bilaspur and Divisional Forest Officer Sh. Sanjay Yadav and Sh. Chandra shekhar were also present in the program.

ICFRE-Tropical Forest Research Institute, Jabalpur conducted six different training programs on **"Sustainable Agroforestry Ventures: Empowering Entrepreneurs through Organic Fertilizers, Biofertilizers and Biopesticides"** in two states, from 5th – 7th, 8th – 10th & 11th – 13th February 2024 at Krishi Vignan Kendra, Kanker (Chhattisgarh) and 4th – 6th, 7th – 9th, 11th – 13th March 2024 at KVK Koderma (Koderma dist), Torpa, Karra (Khunti district) Jharkhand. These training programs were sponsored by Chaudhary Charan Singh National Institute of Agricultural Marketing (NIAM), Jaipur, and organized by Forest Protection Division with the support of Silviculture, Forest Management and Agroforestry Division, ICFRE-TFRI. The training aimed to provide participants with a comprehensive understanding of biofertilizers, including their composition, benefits, and application methods, enabling them to make informed decisions regarding their usage in sustainable agroforestry.

ICFRE-Tropical Forest Research Institute, Jabalpur conduced one week training from 11th-15th March, 2023 on **"Propagation of RET and Economically Important Forestry Species along with Hi-Tech Nursery Techniques".**

Visits and Demonstration of Stakeholders

Forest Guards of Forest Rangers College, Balaghat (M.P.) visited ICFRE- TFRI on 03.11.2023.

Students of PM Shree Kendriya Vidhyalaya, Jabalpur visited ICFRE- TFRI on 03.11.2023 and 9.11.2023.

Students of Gyan Ganga Institute of Technology & Science, Jabalpur (M.P.) visited ICFRE-TFRI on 08.11.2023 and 9.11.2023

Students of Hitkarini College of Pharmacy, Jabalpur (M.P.) visited ICFRE- TFRI on 08.11.2023.

312 students from the September 6th, 7th and 8th std. of Government Shramodya Residential School, Mangeli, Jabalpur (MP) visited ICFRE - Tropical Forest Research Institute, Jabalpur, Madhya Pradesh.

A team of 97 students and 10 teachers from PM Shri Kendriya Vidyalaya, Mandla (M.P.) visited ICFRE - Tropical Forest Research Institute Jabalpur on 20.12.2023.

Dr. S.C. Biswas, Scientist-E, ICFRE-Tropical Forest Research Institute, Jabalpur, displayed various value-added products of the wild fruit *Carissa carandas* (cranberry) in the market of village Dhuma. He provided detailed information to the farmers about the uses and benefits of cranberry.

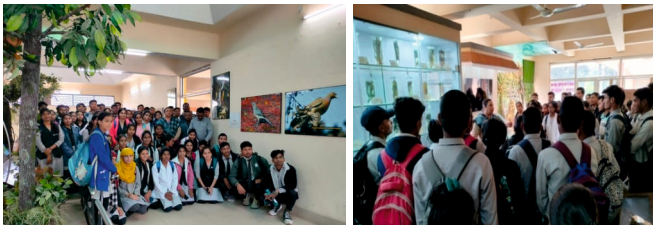
41 students of PM Shri Kendriya Vidyalaya, Katni (M.P.) visited ICFRE - Tropical Forest Research Institute, Jabalpur, Madhya Pradesh on 8.12.2023.

Shri M. Rajkumar, Scientist-D of Forest Ecology and Climate Change Division delivered a lecture on **'Rejuvenation of River Narmada through forestry interventions'** to the participants during 3-days training session of Management Development Program for other stakeholders on 'Science and Art of River Rejuvenation Through Forestry' organised by IIFM, Bhopal.

There were about 22 participants including students, research scholars, young entrepreneurs and interns from NGOs and practitioners who are working on issues related to water resources and its conservation.

58 students accompanied by 10 faculty members of PM Shree Govt. Integrated Vidhyalaya, Ghunsaur visited ICFRE - Tropical Forest Research Institute, Jabalpur. They were briefed on various forestry research activities displayed at TFRI Museum cum interpretation centre and on medicinal plants and their utilization at the TFRI, NWFP nursery.

93 students of second year Botany along with 3 teachers from Government Model Science College, Jabalpur (MP) visited (ICFRE) - Tropical Forest Research Institute, Jabalpur. The main objective of this visit was to gain more and more information about various plants and to directly observe and learn about the research conducted by the institute.



ICFRE - Tropical Forest Research Institute Jabalpur organised the **"Prakriti Programme Mission Life"** for 300 students from Govt. Higher Secondary School, Sagda, Jabalpur. Dr. Nanita Berry, Head of the Forest Extension Division briefed them about the programme. Shri. M. Rajkumar, Scientist, delivered a lecture on Environment Awareness. Smt. Bharti Anthony, Principal along with 15 teachers showed keen interest in organizing more programmes and exposure visit at TFRI.

ICFRE - Tropical Forest Research Institute Jabalpur conducted **an exposure cum field visit for 32 students** from Pharmacy from Gyan Ganga College, Jabalpur. The students were briefed about various ongoing activities of the institute. They showed keen interest in learning about plants for herbal drugs. They also visited NWFP nursery for identification and utilization of commercially important medicinal plants.

Visit of Dignitaries

Shri Prakash Kumar Tamrakar, Director, Ministry of Environment, Forest & Climate Change, Government of India, New Delhi visited ICFRE- Tropical Forest Research Institute, Jabalpur on 18 December 2023. During his visit, he interacted with Dr. H. S. Ginwal, Director, ICFRE-TFRI, Jabalpur, about various aspects of institute's functioning. Shri Tamrakar appreciated the efforts being carried out by the institute for research and revenue generation.

Director's Visit

Director ICFRE- TFRI, Jabalpur, Dr. H.S. Ginwal conducted meeting with Shri. Shailesh Tembhurnikar, PCCF and Head of Forest Force (HoFF) along with other higher officers of Maharashtra State Forest Department on 29 November 2023 at the PCCF Office, Nagpur. They discussed ongoing research activities of the institute and potential research areas for further collaboration with the State Forest Department. Shri Shailesh Tembhurnikar assured his department's support and cooperation in addressing regional problems of the state.

Dr. H.S. Ginwal, Director ICFRE-TFRI, Jabalpur and Scientists

Dr. Avinash Jain, Dr. Hari Om Saxena, Sh. N.D. Khobragade interacted with the officials from Western Coal Field Limited, Parasia, Tamia (Chhindwara). They discussed about the biodiversity of Patalkot and emphasized on collective efforts in future for its conservation.

Dr. H. S. Ginwal, Director, ICFRE - Tropical Forest Research Institute, Jabalpur visited ICFRE- ICFRE-Skill Development Centre, Chhindwara on 1 December 2023. He reviewed all the research and extension activities of the center and motivated all the scientists and staff to make efforts for generating funds for the center. Dr. Avinash Jain, Scientist-F, Head of the Ecology Division also accompanied during the


Celebration of Important Days

Constitution Day

ICFRE - Tropical Forest Research Institute, Jabalpur Madhya Pradesh celebrated Constitution Day on 26th November 2023 by reading the Preamble of the Constitution of India. The program was attended by Dr. H.S. Ginwal, Director, Smt. Neelu Singh, GCR, all head of the divisions, officers, staff and research scholars of the institute. Employees of the institute also registered online.


Janjatiya Guarav Diwas

In a series of 3rd Janjatiya Guarav Diwas 2023, ICFRE - Tropical Forest Research Institute Jabalpur Madhya Pradesh organized **'Environment Awareness Program'** for 400 tribal students of Class 6th to 12th of 'Eklavya Model Residential School in Barbati village of Jabalpur, Madhya Pradesh on 22nd November 2023.The Students of the school greeted the dignitaries with Swagat Geet and Saraswati Vandana. Dr. S. N. Mishra, Scientist, TFRI briefed about the institute and Dr. Nanita Berry, Head of the Extension division explained the aim of the event and TFRI 's work towards upliftment of tribal communities. A TFRI documentary film was also screened for the students and teachers. Shri O.P. Daheriya, Principal showed keen interest to participate in other awareness program of the institute as well. The program was well coordinated by the staff of Extension division and EMR School.


ICFRE - Tropical Forest Research Institute Jabalpur (M.P.) organised on Janjatiya Guarav Diwas on 15 November 2023, commemorating the 148th Birthday of Shri Birsa Munda. Floral tribute was paid by the Director In-charge. All Heads of division, Dy. CF (Admin.), Group of Adivasi, Officers, Staff and Research Scholars of the institute participated in the event. Dr. Nanita Berry, Head of the Forest Extension division recalled the memories of the Shri Mundaji's work emphasizing his advocacy for the **'Jal, Jangal and Jameen'** benefits for the Tribal community.


Swachh Bharat Abhiyan/ Birth Anniversary of Father of Nation Mahatama Gandhi

ICFRE - Tropical Forest Research Institute Jabalpur initiated Swachhta Special Campaign on birth anniversary of the Father of Nation Mahatama Gandhi followed by a swachhta rally. During the campaign, regular cleaning was conducted from 2nd-7th October 2023 in the laboratories, insectaries, cabins, rooms, nurseries, fields and other indoor and outdoor facilities of the institute.



Vigilance Awareness Week- 2023

The observation of Vigilance Awareness Week -2023 (30th October to 5th November, 2023) commenced at ICFRE-Tropical Forest Research Institute, Jabalpur with integrity pledge by all the scientists, officers and staff in presence of Dr. H.S. Ginwal, Director, ICFRE-TFRI. The pledge was led by Dr. Fatima Shirin, Vigilance Officer, she also informed about the theme **"Say no to corruption; commit to the Nation"** and outlined various activities including competitions to be held during the week to promote a corruption free environment within the institute.


Closing ceremony of Vigilance Awareness Week - 2023 was attended by Shri Umashankar Agarwal, Secretary District Legal Service Authority, Jabalpur. He addressed the gathering by emphasizing on public responsibility and the significance of basic legal knowledge for an individual. Dr. H.S. Ginwal, Director, ICFRE-TFRI appreciated the work culture of TFRI and encouraged everyone to maintain ethical standards and integrity in their work. Dr. Fatima Shirin, Vigilance officer highlighted the corruption-free environment maintained at the institute and briefed about various competitions held during vigilance week at ICFRE-TFRI. Dignitaries at the event also presented awards to the participants of these competitions.

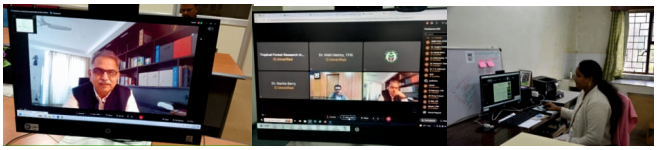
Rashtriya Ekta Diwas-2023

Commemorating the Iron Man of India, Sardar Vallabhbhai Patel, and his significant contribution to the unity of India after Independence, the scientists, officers, and staff of ICFRE - Tropical Forest Research Institute, Jabalpur, paid sincere tribute by taking the Unity pledge on the occasion of his birth anniversary on 31 October, 2023.

World Soil Day 2023

ICFRE - Tropical Forest Research Institute, Jabalpur celebrated World Soil Day, 2023 on 5 December, 2023 with the theme **"Soil and Water: a source of life"**. A total of 50 participants including scientists, technical officers and research scholars of all ICFRE institutes attended the programme.

Dr. H.S. Ginwal, Director, ICFRE-TFRI, Jabalpur delivered the inaugural address emphasizing on importance of soil and water for growth of plants. The key note speech was delivered by Dr. Rajive K. Singh, Head and Principal Scientist (Retd.), Indian Institute of Soil and Water Conservation (IISWC), Kota on **"Achieving Land Degradation Neutrality in India: Perspective on Soil Conservation Issues"**. He elucidated strategies to achieve land degradation neutrality, several soil and water conservation technologies developed by IISWC for ravine lands, rainfed farming systems and watershed management. Dr. Singh also emphasized macro level planning for ravine area rehabilitation. Dr. Jangam Deepika, Scientist-B, ICFRE-TFRI, Jabalpur provided a brief presentation on the Forest Soil Health Cards of Madhya Pradesh prepared by the institute.



To raise awareness about adopting lifestyle changes to protect the environment, a selfie point was installed at ICFRE - Tropical Forest Research Institute Jabalpur as a part of Mission LiFE.

75th Republic Day

75th Republic Day was celebrated by ICFRE-TFRI, during the programme, the National flag was hoisted by Dr. H.S. Ginwal, Director, ICFRE – Tropical Forest Research Institute, Jabalpur. In his address he highlighted the freedom struggle and the drafting of Indian Constitution, along with discussing the country's scientific progress. He listed achievements of institute and council. Winners of various sports events were honored during this program.

International Women Day

International Women Day Celebration program was organized on 8th March, 2024 at ICFRE-TFRI. During the programme women from SHGs conducted cleaning activities along the Narmada river and worshiped holy river to conserve it's Aviral and Nirmal Jal .

International Day of Forest 2024

ICFRE - Tropical Forest Research Institute, Jabalpur celebrated International Day of Forest 2024. Approximately 100 students from 3 schools in Jabalpur - Shramodaya Vidyalaya Chuna Golai; Sagda and Siluwa Govt. Higher Secondary School along with institute scientists enthusiastically participated in plantation of 16 species of tree at Nakshtra Vatika inside the TFRI campus to commemorate the occasion. Following the theme **"Forests and Innovation: new solutions for a better world"** a movie on Tigers at National parks of India was screened at the institute for the students. Dr. Nanita Berry, Head, Forest Extension Division updated about the institute's forestry research progress to the students and conducted visits to vermicompost unit, tissue culture lab and TFRI Museum.

STAFF NEWS

Sl. No.	Name of officers/staff	From (Place)	To (Place)
1	Shri Skariah C.G., P.S.	ICFRE-TFRI	IFGTB, Coimbatore
2	Shri Sukh Ram Meena, MTS	ICFRE-TFRI	AFRI, Jodhpur

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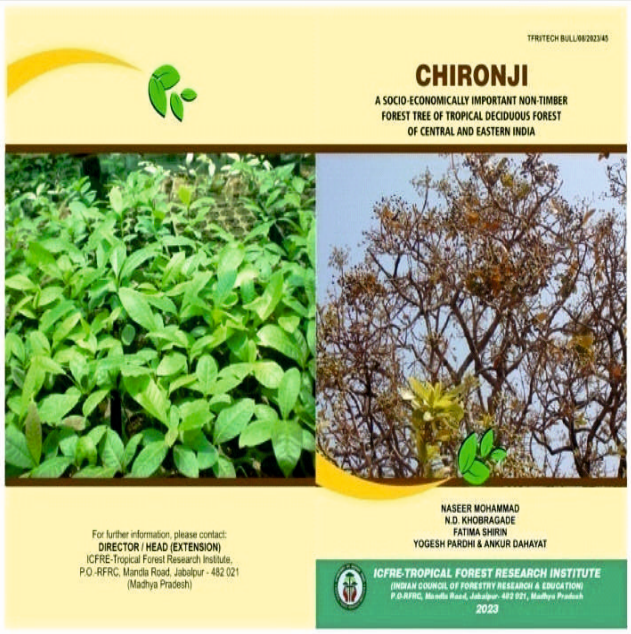


Awards

Dr. Mohan C (Sci-B) Conferred "YOUNG FOREST ENTOMOLOGIST AWARD 2023" on the occasion of 5th International Conference on "Recent Advances in Agricultural, Industrial Entomology, Environmental Sciences and their impact on food and Environmental Security" held at Entomology Research Institute, Loyola College, Chennai, Tamil Nadu.

Infrastructure and facilities available at ICFRE-TFRI, Jabalpur

National Insect Repository

750 species of insects.

Recognized by National Biodiversity Authority (NBA) as National Repository.

Mycology Herbarium

4000 Fungal specimens systematically arranged and documented and 451 species of Fungi identified.

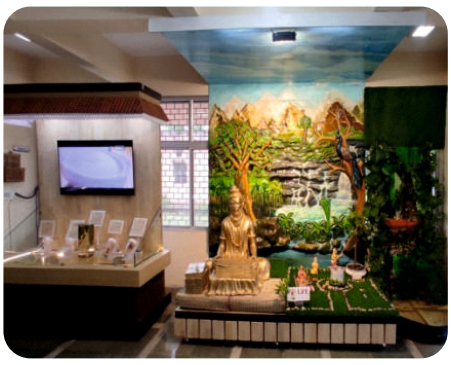
Forest fungi identification service available.

Herbarium

800 plant specimens preserved in Herbarium .

Forest Ecology & Climate Change Division provides services of plant identification on submission of specimens.

Non Timber Forest Produce (NTFP) Demonstration Centre



Interpretation Centre - Museum

Testing facilities available at ICFRE – TFRI, Jabalpur

S. No.	Parameter	Price in
1	pH	100/- per sample
2	EC	100/-per sample
3	Organic Carbon (OC) /Organic Matter	100/-per sample
4	Major nutrients (N, P, K, Ca, Mg, Na)	300/- each and 1500/- package
5	Micronutrient (Mg, Ni, Zn, Fe, Co, Cr, Cu, Mn, B)	300/- each and 2000/- package
6	Texture analysis	500/-per sample
7	Bulk Density	150/-per sample
8	Total soil Analysis (1 to 7)	4000/-per sample
9	Dry matter / Moisture percentage	100/-per sample
10	Plant testing – N, P, K, Ca, Mg, Na	250/ - element and 1300 /-for all
11	Plant identification charges	250/ - specimen
12	Bio- control agent-egg parasitoid card (25000 eggs /card)	300/ - card
13	Laboratory testing of pesticide (biopesticide / insecticide) against insect defoliator/ white grub	20,000/- per defoliator 40,000/- per white grub
14	Field testing of insecticides against termites and insect defoliators	1,00,000/-
15	Identification services for decay fungi/mould	1000/ species
16	Identification of fungal specimen and its matching with herbarium	250/-per sample
17	Micro photography of fungi	100/-per sample
18	Seed germination and viability test	500/ - per sample
19	Seed purity tests	400/ - per sample
20	Moisture content of seeds	200/ - per sample
21	Determination of phenols (if standards available)	600/ - per sample
22	Determination of tannins (if standards available)	600/ - per sample
23	Determination of carbohydrates (if standards available)	600/ - per sample
24	Determination of starch (if standards available)	600/ - per sample
25	Determination of chlorogenic acid (if standards available)	600/ - per sample
26	Determination of Protein (if standards available)	600/ - per sample
27	Chemo profiling of medicinal plants with the help of HPTLC	2000/- for the first sample & 500/- per subsequent sample of the same sp.
28	Leaf area Measurement	200/- per sample
29	Estimation of a single marker constituent in plant extract	5500/ - per sample for Academia / R &D, 10000/ - per sample for Industry
30	Ash Content	610/-per sample for Academia , 1100 / per samplee for Industry
31	Microscopic analysis	500/- per sample

Services available for the Society

Plant Species and plant Available for Sale at Genetics and Tree Improvement Division, TFRI, Jabalpur

Improved Varieties-Cost per plant- Rs. 100/- plant

S. No.	Species	Number of Plants Available
1.	*Rauvolfia serpentina* TFRI RS-1 (Sarpagandha)	200
2.	*Rauvolfia serpentina* TFRI RS-2 (Sarpagandha)	150

Bamboos Species- Rs. 25/-plant

S. No.	Species	Number of Plants Available
1.	*Bambusa bambos* (Katang bans)	1350
2.	*Bambusa vulgaris* (var. green)	110
3.	*Bambusa nutans*	75
4.	*Dendrocalamus strictus* (Lathi bans)	940
5.	*Dendrocalamus longispathus*	100

Tree Species and Medicinal Plants- Rs. 25/- plant

S. No.	Species	Number of Plants Available
1.	*Tectona grandis* (Teak, Sagoan)	200
2.	*Dalbergia latifolia* (Kala shisham, Rosewood)	200
3.	*Celastrus paniculatus* (Malkagini, Jyotishmati)	100
4.	*Plumbago zeylanica* (Chitrak)	100
5.	*Oroxylum indicum* (Shivnag)	50
6.	*Tamarindus indica* (Imli)	150
7.	*Azadirachta indica* (Neem)	50

Seeds and plants available for sale

S1.No	Common name	Scientific name	Seeds (Rs/kg)	Plants (Rs./Plant)
1.	Sagon	*Tectona grandis*	5000/-	30/-(Seed raised)
2.	Beejasa1	*Pterocarpus marsupium*	5000/-	60/-(Tissue culture raised)
3.	Sheesham	*Dalbergia latifolia*	7000/-	31/-
4.	Sisso	*Dalbergia sisoo*	3000/-	50/-
S.	Maida chhal	*Litsea glutinosa*	l0000/-	31/-
6.	Chironji	*Buchanania lanzan*	8000/-	100/-
7.	Kullu	*Sterculia urens*	---	50/-
8.	Mahua	*Madhuca longifolia*	5000/-	50/-
9.	Neem	*Azadirachta indica*	5000/-	50/-
10.	Imli	*Tamarindus indica*	3000/-	50/-
11.	Bel	*Aegle marmelos*	---	30/-
12.	Karanj	*Pongamia pinnata*	3000/-	30/-
13.	Khamer	*Gmelina arborea*	1000/-	30'-
14.	Haldu	*Adina cordifolia*	---	50/-

15.	Bamboo	Different Species	---	50/-
16.	Sarpagandha	Released Variety TFRI-RS-I,TFRI-RS-II	—	50/-
17.	Kaim/Mundi	*Mitragyna parvifolia*	3000/-	50/-
18.	Kumbi	*Careya arborea*	3000/-	50/-
19.	Jamun	*Syzygium cumini*	3000/-	50/-
20.	Khair	*Acacia catechu*	5000/-	---
21.	Babul	*Acacia nilotica*	3000/-	—

Plants Available for Sale at Silviculture, Forest Management Division, TFRI, Jabalpur

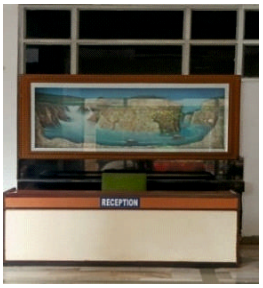
S. No.	Species	Number of Plants Available
1.	*Tinospora cordifolia (Giloy)*	100
2.	*Aegle marmelos (Bel)*	540
3.	*Cymbopogon citratus (Lemon grass)*	100
4.	*Oroxylum indium (Shyonak)*	50
5.	*Mimusops elengi (Moulshri)*	260
6.	*Asparagus racemosus (Satawar)*	100
7.	*Artemisia annua (Davana)*	30
8.	*Phyllanthus emblica*	25
9.	*Terminalia arjuna*	30
10.	*Moringa oleifera L*	1850
11.	*Bamboo*	600
12.	*Delonix regia*	3000
13.	*Cassia fistula*	1000
14.	*Pongamia pinnata*	550
15.	*Tamarindus indica*	820
16.	*Albizia lebbeck*	5000
17.	*Syzygium cumini*	540
18.	*Terminalia bellirica*	720
19.	*Other Species*	As per availability

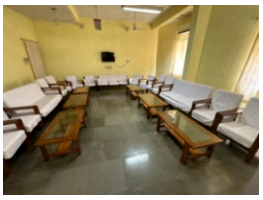
Medicinal/trees species Plants
Rs. 30/- plant

- Prices and number may be vary as per the availability and season TFRI TRICHO-Card
- TFRI-TRICHOCARD developed using the parsitoid, Trichogramma raoi
- It's an Ecofriendly bio-control method for managing teak defoliator & skeltonizer.
- 4 cards required for a hectare area cards available @ Rs. 500/- per card

Guest House facilities and Charges

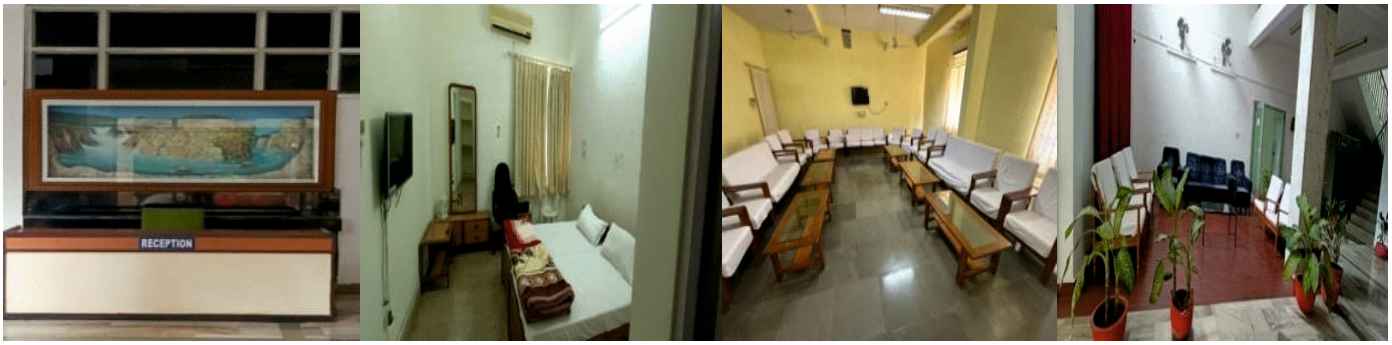
S.No.	Category of Person	Rent per day while on Govt. Duty (Rs.)		Rent per day while not on Govt. Duty (Rs.)	
		Rooms 20 no.	Suits 4 no.	Room	Suit
1.	• Officials of ICFRE and institutes • Consultants and research Fellow at ICFRE and its institutes and FRI Deemed Universities • Officials and experts of MoEF&CC, New Delhi • Officials of SFDs • Ex- employees of ICFRE and Ex-Deputationist	150	200	200	300
2.	Family members of present /ex-employees • ICFRE Employees • ICFRE Deputationist			200	300
3.	• Officials of Autonomous bodies, Universities under the FRI Deemed University • Officials of Central/State Government other than SFDs	200	300	400	500
4.	Others (Non Governmental)			600	750
5.	Community garden/hall with Permanent Stage (Facilities of changing room/ sitting room)	50,000/per day			




Maintenance charges in addition to above rent will be applicable as follows :

Accommodation type	Maintenance charge (including A/C , Heater)
Room	200
Suit	250



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LiFE Lifestyle for Environment

ICFRE – TFRI NEWSLETTER

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About the Institute

ICFRE-Tropical Forest Research Institute ,Jabalpur (Madhya Pradesh) came into existence in April 1988,to provide strong research support to sustainable development of forest and forestry sectors in central India comprising the states of Madhya Pradesh, Chhattisgarh and Maharashtra.

It is one of the nine Regional institutes under the Indian Council of Forestry Research & Education , Dehradun (Uttarakhand) .

ICFRE - Skill Development, Chhindwara , came into existence on 30th March 1995.It was declared on 3rd January 1996, a satellite Centre of Tropical Forest Research Institute, Jabalpur.

Core Research Areas

- Eco-restoration of Vindhyan, Satpura and Maikal hills and Western Ghats, Rehabilitation of mined areas.
- Development and Demonstration of Agroforestry Models
- Forest Protection
- Biofertilizers and Biopesticides
- Non-Wood Forest Products
- Biodiversity Assessment, Conservation and Development
- Sustainable Forest Management
- Planting Stock Improvement
- Climate Change & Environment Amelioration
- Forest Products Development