

T.F.R.I.



ANNUAL REPORT





बांस का व्यावसायिक महत्व

TROPICAL FOREST RESEARCH INSTITUTE, JABALPUR



















TFRI, JABALPUR Annual Report 2021-22

Overview: Please indicate most important achievements/new initiatives (not more than 200 words) during the period under report.

• 57 Phenotypically superior trees of *Tectona grandis* (44 Plus trees in M.P. and 13 in Chhattisgarh) were selected for assessing their genetic diversity.

- Teak Clonal Seed Orchard representing 15 clones and 12 ramets of each of Madhya Pradesh was established.
- FRC-SD developed herbal value added food product "Energy Bars", cream and toothpaste from Mahua and value added product "Hand Wash" from *Cassia tora* leaves extract.
- 10 different herbal mosquito repellent compositions used for making agarbatti sticks. Mosquito repellent activities fo agarbatti was certified by NABL accredited lab.
- Results reflect that *C. furcellata* could safely be used as potential bio-control agent in pest management programme of major larval defoliator pests in teak and Chick pea.
- DPR on Rejuvenation of River Narmada through Forestry Intervention in the riverscape area with the aim to achieve Aviral Dhara and Nirmal Dhara with a total financial outlay of Rs 2127.28 crore under Rejuvenation of thirteen Major Rivers through Forestry Interventions programme.
- Collected data on tree parameters of important species of C.G. to revise Form Factors and Form Quotient and standardized methodology for estimation.
- Rs.1.027 crore revenue generated, out of which Rs. 68.58 lakhs received from consultancies and EAP projects and Rs. 22 lakhs received as dissertation testing charges and transferred to ICFRE by TFRI, Jabalpur.

Summary of projects Yr. 2021-2022:

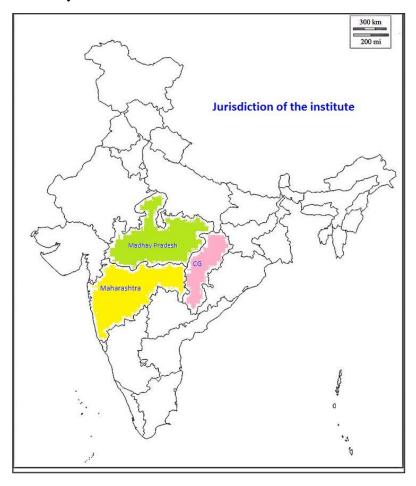
Project	Completed Projects	Ongoing Projects	New projects initiated during the
			year
Plan	05 and	04	04

	ID(193- iv component)		
Externally	09	13	04
aided			

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1. Introduction:

Tropical Forest Research Institute (TFRI), Jabalpur (M.P.) with its satellite research centre, named FRC-SD, Chhindwara provides research support to State Forest Departments of Madhya Pradesh, Chhattisgarh and Maharashtra and other stakeholders since 1973/1988. The institute is spread over an area of 109 ha and maintain constant liaison with state forest departments, NGOs working in the field of forestry and allied areas, universities imparting education in forestry and forest based industries.



Details of MoUs:

S No.	Year		For	Duration	Amount (in Lakh)
1)	2021	CEO,CAMPA, CHHATTISGARH, RAIPUR	Monitoring and evaluation of CAMPA works executed by Chhattisgarh Forest Department under APO 2015-16, 2016-17 and 2017-18, which have been furnished vide D.O. No 242 CAMPA-02 dt. 3-07-2017 by the Addl. PCCF (CAMPA), Chhattisgarh	18 months	Rs 120.00 lakhs
2)	2021	PCCF, HoFF, CGFD, RAIPUR	Developing synergy in forestry research and extension	05 years	
3)	2021	ICAR-DWR, JBP and CGSFD Under CAMPA-CEO APO- YEAR 2018-19 & 2019- 20	Removal of invasive alien species Research output for "Impact assessment of Lantana camara removal in Chhattisgarh State".	2 year	31.95
4)	2021	Mangalayatan University, Jabalpur	For cooperation in applied research programs, capacity building and knowledge sharing on forest, biodiversity conservation, ecosystem, climate change vulnerability, climate change mitigation and adaptation and livelihood of forest dependent communities.	5 year	
5)	2021	Jawaharlal Nehru Krishi Vishwa Vidyalaya (JNKVV), Jabalpur	For cooperation in applied research programs, capacity building and knowledge sharing on forest, biodiversity conservation, ecosystem, climate change vulnerability, climate change mitigation and adaptation and livelihood of forest dependent communities.	5 years	
6)	2021	National Institute of Agricultural Extension Management (MANAGE)' Hyderabad	For capacity building, strengthen Extension approaches, promotion of adaptation and mitigation to Climate change. Agroforestry, Biodiversity, Watershed development, carbon sequestration, carbon finance, participatory Forest Management' Minor Forest Products, Formation and nurturing of User Groups,, Incubation, Startup and other sustainable practices in forest management.		
7)	2021	DFO, Morena (MP)	To achieve objectives under AICRP project "combating desertification by enhancing vegetation cover ad people iivelihoods in degraded lands and deserts of India,, along with other institutes of ICFRE vrz. Arid Forest Research Institute' Jorhat; Himalayan Forest research Institute, Shimla, Forest Research institute' Dehradun: Institute of Forest Genetics and Tee Breeding, Coimbatore and Institute of Forest Productivity, Ranchi.	5 year	Rs. 2174121.00
8)	2021	INDIAN FARM FORESTRY DEVELOPMENT COOPERATIVE LIMITED (IFFDC), GURUGRAM	For facilitating academic and Research activities for Natural Resources Management, Forestry, Eco-restoration Environment Conservation, Agro-	5 years	

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			forestry, Rural Livelihood Development, Community Institutions Development, Women Empowerment etc.		
9)	2021	MoU between TFRI Jabalpur and KFRI Peechi	For scientific support for decision making on matters related to forestry, with particular emphasis on conservation, sustainable utilization and scientific management of natural resources.	5 years	
10)	2021	MoU between TFRI, Jabalpur and Dr. Y.S.R. HORTICULTURE UNIVERSITY, Venkataramannaguden- 534 101 , West Godavari distt., Andhra Pradesh	For scientific support and projects requiring expertise and logistics from both the parties.		
11)	2021	With CCF R&E CGSFD through DFO (Res. & Ext.), Jagdalpur (CG)	To achieve approve objectives of VVK funded by ICFRE	5 years	
12)	2021	MoU between TFRI, Jabalpur and RLBCAU, Jhansi	For cooperation in applied research programs, capacity building and knowledge sharing on forest, biodiversity conservation, ecosystem, climate change vulnerability, climate change mitigation and adaptation and livelihood of forest dependent communities.	5 years	
13)	2021	MoU between TFRI, Jabalpur and ICAR-ATARI, Zone-IX, Adhartal, Jabalpur	To achieve objectives as approved by ICFRE for Networking with KVKs programme	5 years	
14)	2021	MoU between TFRI, Jabalpur and RVSKVV, Gwalior	For cooperation in applied research programs, capacity building and knowledge sharing on forest, biodiversity conservation, ecosystem, climate change vulnerability, climate change mitigation and adaptation and livelihood of forest dependent communities.	5 years	
15)	2021	MoU between TFRI, Jabalpur ICFRE & ICAR- Central Agro. Res. Ins., (CAFRI) Jhansi	For cooperation in applied research programs, capacity building and knowledge sharing to develop sustainable agroforestry practices for farms, marginal land and wastelands in different agroclimatic zones of India; Coordinate network research for identifying agroforestry technologies for inter-region; Training in agroforestry research 'for ecosystem analysis and Transfer of agroforestry technology in various agroclimatic zones. CAFRI has developed robust agroforestry models and package of practices for different agro-climatic conditions covering small and marginal farmers for suitable production of food, fodder, fuel, fibre and fertilizers.	5 years	
16)	2021	MoU between TFRI, Jabalpur and BUAT, Banda	For cooperation in applied research programs, capacity building and knowledge sharing on forest, biodiversity conservation, ecosystem, climate change vulnerability, climate	10 years	

17)	2021	MoU between TFRI, Jabalpur and ICAR- IGFRI, Jhansi	change mitigation and adaptation and livelihood of forest dependent communities. The parties having discussed fields of common research interests and allied activities between the two institution, have decided to enter into long-term collaboration for promotion of Research, training and consultancy services in cutting edge areas in accordance with the provisions contained in the Guidelines issued vide letterNo.2-8I2012-HRD detail 11th December2012 or as revised from time	5 years	
18)	2021	MoU between TFRI, Jabalpur and Vikram University, Ujjain	to time For cooperation in applied research programs, capacity building and knowledge sharing on forest, biodiversity conservation, ecosystem, climate change vulnerability, climate change mitigation and adaptation and livelihood of forest dependent communities and advanced research in subject of plant science, animalscience, chemical science and environment sciences.	5 years	
19)	2022	MoU between TFRI, Jabalpur and ICAR-IIWCRC, Datia	To participate jointly in the projects requiring expertise and logistics from both' the parties.	5 years	
20)	2022	MoU between TFRI, Jabalpur and The International Centre for Research in Agroforestry of P.O. Box 30677-00100 Nairobi, Kenya,	For financing of a Project Agreement between ICRAF and United States Agency for International Development IUSAID) with regard to "Tree Outside Forests in India (TOF)	5 years	
21)		MoU between TFRI and Rajmata Vijaya Raje Sindhiya Krishi Vishwa Vidyalaya, Gwalior	Terms of payment signed between TFRI and Rajmata Vijaya Raje Sindhiya Krishi Vishwa Vidyalaya, Gwalior for raising plantation on Chambal ravines	-	-

Visit of dignitaries :

- 1 Dr.Somendra Singh Parihar, Senior Manager (P&S and NI), NTPC Limited, Vindhyanager, Singrauli (M.P.) was visited to FRC-SD Centre, Chhindwara on 18.8.2021.
- 2 Mr. C.L. Agrawal, Director, Achanakmar, Amarkantak Biosphere Researve, Chhattisgarh visited TFRI on 5th October, 2021.
- 3 Shri Siddharth Bahuguna, Superintendent of Police, Jabalpur delivered a lecture on 1st November, 2021 occasion of Vigilance Awareness week closing ceremony at TFRI, Jabalpur
- 4 Dr. V.K. Bahuguna, Ex-Director General, ICFRE a special guest on 5th November, 2021
- 5 Lt. Gen (Dr) A K Misra, AVSM(Retd)Vice Chancellor of Manglayatan University was visited at Insects repository, Arachnarium and Insectary on 17th December, 2021.

- 6 Dr.Panjab Singh, Chanceller of Rani Laxmibai Bundelkhand Agricultural University, Jhansi visited TFRI on 31.12.2021.
- 7 Shri Bal Krishan Pathak, President of Medicinal Plant Board, Chhattisgarh visited TFRI on 18th February, 2022.
- 8 Shri H. V. Girisha, Joint Director "Wildlife Crime Control Bureau" New Delhi, visited TFRI on 23/02/2022.
- 9 Head, Bio research Development, Dabur research development center Ghaziabad visited TFRI and interacted with Director for various research carried out in the field of medicinal plant in TFRI 08/03/2022

New initiatives:

1. TFRI Newsletter has been published and 1st issue was released on 5th January by Sh. Faggan Singh Kulaste, Hon'ble Minister of State for Steel & rural Development, Government of India, New Delhi.

2. Research Highlights

A CAMPA Activities

CAMPA Activities: 1. AICRPs 2. NFGRs 3. CAMPA Extension – Material for this section will be compiled and edited by the NPCs of concerned AICRPs/NGFRs and material to be sent by their respective institute.

At TFRI, Jabalpur total (23+3)= 26 AICRP's, funded by CAMPA, New Delhi are being executed.

B Plan and External Projects

2.1 Ecosystem Conservation and Management

- 2.1.1 Overview
 - 2.1.1.1 Projects under the Theme

Projects	Completed Projects	Ongoing Projects	New Projects Initiated During the Year
Plan	-	-	-
Externally Aided	-	01	-

- 2.1.2 Climate Change
- 2.1.3 Ecology & Environment
- 2.1.4 Biodiversity

"Quantitative assessment of land degradation in forests of three western districts of Madhya Pradesh and suggest mitigation measures".

Status of forest land degradation is being quantified in three western districts (Dhar, Jhabua and Mandsaur) of Madhya Pradesh. Carbon stock in soil and vegetation were measured as indicators to ssess the level of degradation. Collected data on vegetation in ten 0.1 ha quadrats in each of the Beat/Compartment. A spatial map on severity of degradation in forests of these 3 districts is being prepared.



Fig.1. Laying quadrats for vegetation studies and collection of soil samples in Mandsaur Forest Division

- 2.1.5 Forest Botany
- 2.1.6 Tribals and Traditional Knowledge System

2.2 Forest Productivity

2.2.1 Overview

2.2.1.1 Projects under the Theme (in table as given at 2.1.1.1)

Projects	Completed Projects	Ongoing Projects	New Projects Initiated During the Year
Plan	02	-	01
Externally	=	05	02
Aided			

2.2.2 Silviculture

"Development of form factors for important tree species of Chhattisgarh".

Data on tree height, tree girth at different height segments from standing as well as felled trees of varying girth classes of economically important species *viz.Terminalia tomentosa*, *Pterocarpus marsupium*, *Dalbergia sissoo*, *Tectona grandis*, *Adina cordifolia*, *Terminalia arjuna*, *Bridelia retusa*, *Ougenia dalbergiodes*, *Gmelina arborea* and *Mitragyna parviflora*had been collected from Rajnandgaon, Balod and South Kondagaon forest divisionsto compute form factors using "Volume of frustum method".



Fig.2. Measurement of tree diameter at different height segments of *Terminalia arjuna* at Balod forest division, CG using Basal Area Finder (BAF) Scope.



Fig.3. Measurement of tree diameter of *Tectona grandis* in Rajnandgaon forest division, Chhattisarh.

"Study on ecophysiology of seed germination and seedling survival for restoration of natural regeneration of two threatened species of Central India".

Effect of various ecological factors on the ratio of flowering and fruiting were evaluated with refrence to total seed production and seed viability of *Dalbergia latifolia* and *Litsea glutinosa*. It is found that seed germination is not affected by forest density. *D. latifolia* germinates better in mixed soil in comparsion to sandy soil or clayey soil whereas *L. glutinosa* seeds germinate better in sandy soil in comparison to mixed and clayey soil. Seeds of both species are orthodox and didn't lose viability, up to 5-7% moisture content and at ambient temperature. Seeds of *D. latifolia* started germination at last stages of maturation when seed moisture content was approx 43%. Seed fall before this maturation stage could not produce any viable seedlings. In *L. glutinosa'* only fully mature seeds can produce seedlings after few months (they are dormant). No loss of seeds of *L. glutinosa* and *D. latifolia* was found due to predation. Loss of moisture during early stage of growth affected *D. latifolia*, whereas *L. glutinosa* seedlings were more tolerant to drying.

"Studies on quality of nursery seedlings and their relation to outplanting performance of Dalbergia latifolia and Pterocarpus marsupium".

Seeds of *Dalbergia latifolia* and *Pterocarpus marsupium* were collected from Jabalpur and Chindwara districts. Seeds were sown in,Polythene bags and root trainers filled with soil, sand and FYM in the ratio of 1:2:1. Approximately 4000 seedlings of each of two types of culture: bareroot and root trainer was prepared. After 1-1½ year of sowing of seeds of *D. latifolia* and after 6 months of sowing of *P. marsupium*, seedlings were grouped into four shoot height categories. Data on stem diameter, no. of first-order lateral roots, root volume, chlorophyll content, height: diameter ratio, form, no of leaves, carbohydrate content of four groups were estimated in representative of

25 percentiles within the shoot height distribution of each species. Seedlings were then outplanted into a replicated experimental design on a field planting site. More seeds of *D. latifolia* and *P. marsupium* were collected in March' 2022 for production of seedlings.

"Impact of Silviculture systems on the natural forests of Chhattisgarh with special reference to Sal and bamboo".

Selected 8 Sal forest compartment in Dhamtari Forest Division, Chhattisgarh and collected data on growth parameters, regeneration status, dominant, co-dominant trees etc. from 3 sites. Yield and productivity of Sal have been worked out with reference to different silvicultural systems.

2.2.3 Social Forestry, Agro-forestry/ Farm Forestry

"Development of *Buchanania lanzan* Spreng. based agroforestry system in Central India" was under progress due to non availability of fund.

Project initiated in April, 2022

"Tree outside forests of India".

Project initiated in April, 2022.

'Development of *Gmelina* based agroforestry system in M.P".

Developed *Gmelina arborea* based agroforestrysystem for Madhya Pradesh with some shade loving medicinal crops viz. *Asparagus racemosus, Curcuma longa,* and *Zingiber officinale* and *Piper betle* as an intercrops. Nutrients status was also found changed under the adopted system during the study period. Maximum Nitrogen content was increased upto (27.5 kg ha⁻¹) than that of sole – 18kg ha⁻¹. Similarly, Organic carbon contents was also increased from 0.64% to 1.13%. Based on yield data, Economic analysis of the system was calculated and found the B:C ratio 2.72:1 as compared to sole 2:1. Findnings was extended through online and offline training programmes to the various stakeholders





Fig. 4. Training programmes for various stakeholders and field visit

"Promotion of Bamboo based Agroforestry System for economic upliftment and livelihood security of farmers in Madhya Pradesh".

Bamboo based agroforestry systems established and maintained in 15 farmer's field. Tools were also provided to maintain and manage the bamboo culms for pruning, inter culture operations for healthy culms. A trainingprogramme on 12 th March, 2021 organized at Farmer's field to demonstrate the harvesting and management techniques of bamboo culms.

"Popularization of Improved var. of *Leucaena leucocephala* (Lam.) de Wit. Based Agroforestry system".

Leucaena based agroforestry system with intercropping of Zea mays (Kharif) and Brassica juncea and Cymposis tetragonaloba (Rabi) has been promoted and distributed to farmer's of Chandiya and Umariya village underMoU with wood based industry to buy back the wood material from the farmers, established at farm field. For successful programme high yieldseeds of L.leucocephala cv.-K 636 procuered from CRIDA, Hyderabad (Telangana).

Recorded growth and yield data of the tree as well as crops. *L.leucocephala* performing better with intercrops and attains height of 3.5mt within two years as compared to the sole crop.

"Capacity building on seed and nursery technology and Plantation techniques for prioritized species of Chhattisgarh state".

Prepared extension material on 'Seed and Nursery techniques of commercially important tree species' for distribution among forest officials and other stakeholders. Conducted online training programme on "Seed handling techniques, plantation and management of commercially important forest species" for the forest officials of Durg, Raipur, Bilaspur, Ambikapur and Jagdalpur circles of Chhattisgarh.

- 2.2.3 Social Forestry, Agro-forestry/ Farm Forestry
- 2.2.4 Forest Soils & Land Reclamation
- 2.2.5 Watershed Management

2.3 Genetic Improvement

2.3.1 Overview

2.3.1.1 Projects under the Theme (in table as given at 2.1.1.1)

Projects	Completed Projects	Ongoing Projects	New Projects Initiated During the Year
Plan	02 + 193(iv)	04	01
Externally Aided	02	04	01

2.3.2 Conservation of Forest Genetic Resources

"Selection and evaluation of natural population of *Terminalia bellirica* (Gaertner) Roxb. for its active ingredient content".

58 phenotypically superior trees on the basis of height, girth, spreading pattern of the tree and length and breadth of leaves and morphology of *T. bellirica* were marked alongwith GPS location in Amravati, Gondia and Bhandara forest divisions in Maharashtra, Chhindwara, South Balaghat and West Betul forest divisions in Madhya Pradesh and Dhamtari forest division in Chhattisgarh.

It was observed that maximum germination percentage were recorded in CPT number 2 (86%) followed by CPT no. 13(66%).

Analysis of gallic acid from *Terminalia bellirica* fruits has been carried out. It was observed that the highest gallic acid content (0.98%) was found in Karegaon range under Dhamtari forest division (Chhattisgarh) and lowest gallic acid content (0.6%) was found in Mouda range under Betul forest division (Madhya Pradesh).

"Variability for Growth, wood traits and natural regeneration status of *Hardwickia binata* a multipurpose tree species in Madhya Pradesh"

12 populations of *H. binata* were identified in Khandwa, Barwah and Burhanpur forest divisions of Madhya Pradesh and seeds were collected, physical parameters of fruits/seeds were recorded.

Poor regeneration of *H. binata* observed in Khandwa, Burhanpur & Barwaha Forest Division sites.

"Introduction and evaluation of Melia dubia in Central India".

50 improved genotypes of *Melia dubia* has been established in five selected sites viz. Morena and Chhindwara (Madhya Pradesh), Nagpur and Amravati (Maharashtra) and Durg (Chhattisgarh) with three replications in a randomized block design.80-90 percent survival has been recorded in all the planted sites.

"Genetic improvement and conservation of Chironji (*Buchnaniacochinchinensis* Lour.) in Central and Eastern India".

Surveyed the potential areas of Chironji and selected 139 phenotypically promising trees in three different categories i.e. Spreading, Semi-spreading and Upright marked in Betul, East Chhindwara, West Chhindwara, Katni forest divisions of Madhya Pradesh and Marvahi, Chhattisgarh. Data as per DUS (Distinctness Uniformity and Stability) guidelines notified by Protection of Plant Varieties and Farmers Rights Authority, (PPV & FRA), New Delhi had been recorded. Among the marked trees, tree height ranged from 3.6 to 26m, number of branches 2 to 9, panicle length 7.6 to 26 cm and fruits per panicle 16.73 to 47.7 cm. Progenies of all the marked CPTs were raised for the establishment of progeny trial.

"Assessment of diversity and natural regeneration status of *Sterculia urens* Roxb. for development of conservation strategy in Madhya Pradesh".

Surveyed Khandwa, South Seoni, North Seoni, Jabalpur, Rewa, Chhatarpur, Tikamgarh, Jhabua, Shivpuri, Gwalior and Sheopur Forest Divisions for *S. urens*. Recorded morphometric data along with GPS coordinates and natural regeneration at these sites. Natural regeneration of this species is observed very low despite profuse flowering and fruiting.

"Conservation of *Litsea glutinosa* Lour. through population establishment in Madhya Pradesh".

To reduce extinction risk and increase thelong-term security *L. glutinosa*. One block plantation was established in Bargi Range, Jabalpur Forest Division in 2021 and three sites were finalized in Chhindwara Forest Division [one each at Compt. No. P-104, Dellakhari range; Compt. No. P-45, Jhirpa range and Compt. No. P-97, Dellakhari range.

For awareness activities, leaflets in vernacular languages (Hindi, Marathi) were prepared and will be distributed.

"Conservation of RET species of Chhattisgarh – *Plumbago zeylanica* and *Celastrus paniculatus* and production of quality planting material".

Germplasm bank of plants of *Plumbago zeylanica* from 10 locations and plants of *Celastrus paniculatus* from 14 locations of Chhattisgarh was established at TFRI, Jabalpur. Oil extraction from seeds of *C. paniculatus* collected from Pendra, Chhattisgarh was carried out. Peroxidase, flavonoid and carbohydrate contents were estimated in leaves of *C. paniculatus*. Biochemical analysis in roots (carbohydrates, tannins, flavonoids) and leaves(carbohydrates, chlorophyll, flavonoids) of *P. zeylanica* was done. *Ex vitro* rooting was achieved in the shoots of *Celastrus paniculatus* and plantlets were produced after hardening. Seed sowing of *C. paniculatus* was carried out in the nursery. *In vitro* shoots of both the species were maintained.



Fig. 5. Cuttings of Plumbago zeylanica planted in root trainers



Fig. 6. Establishment of germplasm bank of Celastrus paniculatus and Plumbago zeylanica at TFRI, Jabalpur

"Development of value chain for bamboos for mass multiplication, popularization in farmers field and industrial linkages in central India".

Species trial of six bamboo species viz., *Bambusa nutans*, *Bambusa vulgaris* var. green, *Bambusa balcooa*, *Bambusa tulda*, *Bambusa burmanica* and *Pseudoxytenanthera stocksii* was established in RBD design with spacing of 5m x 4m with four replications in farmer's field at Manpur, M.P. to introduce new bamboo species in Central India.

A plantation of *Bambusa bambos* in 3 ha was established at Kachharwar, Umariya as row plantation at spacing of 5m x 5m. Survival ofplants 75% has been recorded.

In vitro cultures of *Pseudxytenanthera stocksii* was established and shoot multiplication was carried out on MS medium supplemented with 4 mg l⁻¹ BA and 0.25 mg l⁻¹ NAA. Rooting was achieved on MS liquid medium supplemented with 1mg l⁻¹ NAA. [MS- Murashige and Skoog , BA- Benzyl adenine, NAA- Naphthalene acetic acid).Macropropagation is being continued through culm cuttings and cavity method.



Fig. 7. Establishment of species trial of bamboos at Manpur and Umariya, Madhya Pradesh



Fig. 8. Bamboo species trial at Kundam, Jabalpur



Fig. 9. In vitro shoot multiplication and rooting in Pseudoxytenanthera stocksii

"Preliminary assessment of Indian Sandalwood population in Chhattisgarh for growth, heartwood, oil and regeneration status".

Growth data from the plantation in Manendragarh Forest Division and adjoining areas has been recorded. Recorded thickness of bark, sapwood and heartwood.

Core sample of Sandalwood trees collected. and oil percentage in collected samples was estimated.





Fig.10.Collection of core sample, and growth data of Sandalwood plantation, from Hasdev, Manendragarh CG

2.3.3 Tree Improvement

"Improvement of Teak for Higher Productivity in Central/Peninsular India".

Sub Project (IV): Studies on population structure, linkage disequilibrium and marker-trait association mapping of Indian teak.

The possibility of marker-trait relationship was assessed using genome-wide association mapping to invetigate genetic diversity and population structure of teak of central India. Analysis of natural teak populations samples, collected from 13 agroclimatic zones of central India revealed significant differences among sampled populations for tree height, clear bole height, girth at breast height, wood density, fibre length and fibre width. Overall, tree height ranged from 7.62m to 38m, clear bole height from 2.21m to 32m, girth at breast height from 70cm to 265cm and wood density ranges from 401.51 kg/m3 to 792.96 kg/m3 with CV of 12.56%.

"Documentation and assessment of the status of Permanent Preservation Plots (PSP), Seedling Seed orchards (SSO) and Clonal Seed Orchards (CSO) in Chhattisgarh".

Surveyed various CSOs, SSOs and SPAs of different speciesviz. *Tectona grandis, Gmelina arborea, Albizia procera, Dalbergia sissoo*, and *Azadirachta indica* etc. in Bilaspur R&E circle of

Chhattisgarh. Data recorded on growth parameters like height and diameter (GBH), flowering and fruiting status and other information like spacing, existing management practices, seed productivity etc, along with their GPS location for documentation.



Fig. 11. CSO of Teak at Ghasipur (CG) Fig.12.SSO of Khamer at Dhelwapur

"Improvement of Teak for Higher Productivity in Central/Peninsular India".

Sub project I:Selection of plus trees, raising their progeny trials and establishing germplasm bank.

Recorded morphometric data of newly selected 57 plus trees (44 in MP and 13 in CG) of Teak along with the GPS coordinates. Germplasm bank (31 accession) and progeny trial (29 families) respectively of Teak raised in institute campus is being maintained regularly. Growth performance of different progenies from Chhattisgarh and Odisha were found better than the progenies of Madhya Pradesh and Maharashtra.





Fig. 13. Selected Plus Trees in Betul forest division of Madhya Pradesh



Fig. 14. Progeny Trial of Teak in TFRI campus

"Development of Management Practices of Teak Seed Production Areas, Seedling seed orchards and Clonal seed orchards".

Surveyed Seed Production Areas (SPAs) in Sagar, Dewas and Betul forest divisions of M.P. and Pali and Chatuabhauna area of Bilaspur circle in Chhattisgarh and recorded seed status and management practices. Seed productivity status of CSOs and SSOs of Sagar, Betul forest divisions of M.P. and Ghasipur in Bilaspur circle of Chhattisgarh were recorded and management practices suggested to field staffs. Established a Clonal Seed Orchard (CSO) representing 15 clones of Madhya Pradesh and planted 12 ramets (bud grafted) of each clone.



Fig. 15. Seedling Seed Orchard in Institute campus



Fig. 16. Clonal Seed Orchard established in August 2021

"Evaluating the impact of tree improvement activities on seed quality of *Tectona grandis* in Ma Pradesh and Chhattisgarh".

Surveyed and selected 6 SPAs, 2 CSOs and 1 SSO in Madhya Pradesh and 5 SPA, 2 CSO and 2 SSO in Chhattisgarh and collected seeds. Seeds were also collected from unimproved sites also.In Madhya Pradesh, seeds of SPA, Tikaria (West Mandla) found superior in morphological parameters in terms of fruit length, diameter and fruit weight. Emptiness was minimum (59.24%) in seeds of SPA, Moeya Nala (West Mandla) and maximum (73.48%) in SPA Podhi (Umaria) in Madhya Pradesh. In Chhattisgarh, seeds of SPA, Pali were found superior in morphological parameters in terms of fruit length, diameter and fruit weight. Emptiness was minimum (64.29%) in seeds of SPA, Pali (Bilaspur) and maximum (75.78%)in seeds of SPA, Amaruva (Raipur).



Fig. 17. Seed Production Area at Hathni (Damoh) in M.P. and Pali in Chhattisgarh

"Selection of pest and disease free CPTs of *Gmelina arborea* and production of clonal planting material".

Branch cuttings were collected from CPTs selected in Betul (Sonaghati), Chhindwada, Katni (Saraswahi), Damoh (Nohta, Sanga) and Jabalpur (Moiyanala, Barha) in Madhya Pradesh and

semi-hardwood cuttings were prepared from them after treatingthem with 1500 IBA solution for production of rooted plants. New CPTs at different locations were also selected and propagation is being carried out with branch cuttings after treating them with different concentrations of IBA, NAA and IAA respectively. Rooting was also achieved in soft-wood cuttings of selected CPTs by planting them in vermiculite in root trainers after treatment with IBA. Scions were collected from selected trees and cleft grafting on rootstocks was carried out. Around 60-70 % success was achieved during grafting.



Fig. 18. Rooting of softwood cuttings of Gmelina arborea



Fig. 19. Collection of cuttings from selected CPTs of Gmelina arborea



Fig. 20. Cleft Grafting in Gmelina arborea

"Selection and evaluation of Haldina cordifolia for higher wood productivity".

24CPTs,12 each in MP and CG of Haldina cordifolia were identified.



Fig. 21. CPT of Haldina cordifolia (Haldu) tree at Balodabazar Divison, Chhattisgarh

Consultancy Project:

"Development of SOP for developing Quality Planting Material (QPM) of forestry species in Odisha"

A consultancy was awarded for working on the development of standard operating procedures for 30 forestry species given by Odisha Forest Department. Draft SOP manual was submitted to Nodal Institute i.e. IFP, Ranchi.

- 2.3.4 **Vegetative Propagation** -
- 2.3.5 **Biotechnology** –

2.4 Forest Management

2.4.1 Overview

2.4.1.1 Projects under the Theme (in table as given at 2.1.1.1)

Projects	Completed Projects	Ongoing Projects	New Projects Initiated During the Year
Plan	Nil	Nil	Nil
Externally Aided	Nil	Nil	Nil

- 2.4.2 Sustainable Forest Management (SFM)
- 2.4.3 Forest Economics
- 2.4.4 Forest Biometrics
- 2.4.5 Participatory Forest Management
- 2.4.6 Policy and Legal Issues
- 2.4.7 Information and Communication Technology (ICT)

2.5 Wood Products

2.5.1 Overview

2.5.1.1 Projects under the Theme (in table as given at 2.1.1.1)

Projects	Completed Projects	Ongoing Projects	New Projects Initiated During the Year
Plan	Nil	Nil	Nil
Externally Aided	Nil	Nil	Nil

2.5.2 Wood and other Lignocellulosic Composites

- 2.5.3 Wood Processing
- 2.5.4 Value Addition and Utilization
- 2.5.5 Wood Chemistry
- 2.5.6 Pulp and paper

2.6 Non-wood and Forest Products (NWFPs)

2.6.1 Overview

2.6.1.1 Projects under the Theme (in table as given at 2.1.1.1)

Projects	Completed Projects	Ongoing Projects	New Projects Initiated During the Year
Plan	-	=	02
Externally Aided	04	03	-

2.6.2 Resource Development of NWFPs

"Evaluation of hydroponics techniques for the cultivation of medicinal plants- Bacopa monnieri, Centella asiatica, Acorus calamus and Stevia rebaundiana".

Prepared nutrient solution and started experiment in bottles. Developed and established 3

different mini hydroponic systems to initiate trials of targeted species at FRI, Dehradun andtrial of *Bacopamonnieri*(Brahmi) and *Acoruscalamus* has been initiated in Laboratory. Hydroponics system established in TFRI, Jabalpur and species *Centella asiatica* and *Stevia robundiana* plantlets procured to start experiment.







Fig. 22 Mini Hydroponics system and trial of *Baccopa monerri* (FRI,Dehradun)

Fig. 23. Mini Hydroponics system (FRI,Dehradun)

Fig. 24 Hydroponics systems established at TFRI,Jabalpur

- 2.6.3 Sustainable Harvesting and Management
- 2.6.4 Chemistry of NWFPs, Value Addition and Utilization

"Conservation of $Stereospermum\ suaveolens\ (Roxb.)\ DC.$ – A rare species in Madhya Pradesh".

Survey ten different districts of Madhya Pradesh and mapping was done for populations of rare dashmool species S.suaveolensHPTLC of Root bark samples reveals chemical variations (Triacontanol content) in the range of $0.126\pm0.01\%$ to $0.545\pm0.03\%$. Morphological traits were also recorded. Highest amount of triacontanol ($0.545\pm0.03\%$) was found in root bark collected from Khandwa Forest division of Nimar (MP). It is revealed that S.suaveolens have a high level of morphometric variation for tree height, girth at breast height, clear bole height, crown diameter, number of primary branches and leaf area and significant positive association of triacontanol with tree height, girth at breast height and clear bole height.





Fig.25. Germplasm bank of S. suaveolensestablished at TFRI, Jabalpur

"Investigation on variations and domestication of *Curculigoorchioides* Gaertn. (*Kali Musli*) in Madhya Pradesh".

Tubers (apical, distal, end, segments and full part) of *Curculigoorchioides*Gaertn. (*Kali Musli*) were sown in the field to identify and standardize the tuber part for propagation purposes. Samples of *C.orchioides* were collected from nursery experimental beds and morphological data (rhizome length, rhizome thickness, number of rootlets, length of rootlets and rootlet thickness) were recorded. Rhizome and rootlets samples were quantified for Curculigoside content through HPLC technique which revealed the presence of Curculigoside both in rhizomes as well as in rootlets. Phytochemical contentsi.e., phenolic, flavonoid, alkaloid and tannin contents were also analyzed.



Fig.26. Propagation through tuber segments Fig..27. Collection of seeds of C. orchioides

"Standardization of harvesting time and post harvesting techniques of *Helicterisisora* (Marorphali) and *Mucunapruriens* (Kaunch)".

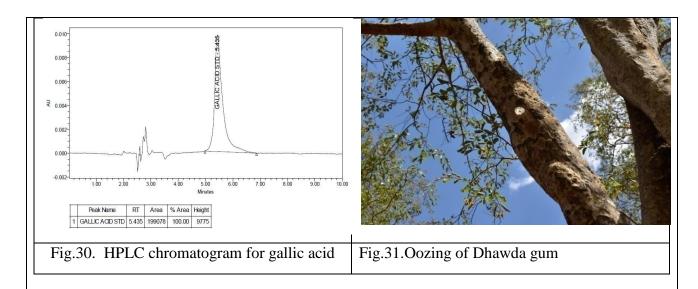
Studies revealed that optimum storage time in term of bioactive compounds lupeol and L-Dopa respectively is 06 months for *Helicterisisora* (Marorphali) and 10 months *Mucuna pruriens* (Kewnach). The suitable containers for storage were found the glass containers, polythene bags and plastic containers. Harveting time of *Helicteris isora* (Marorphali) and *Mucuna pruriens* (Kewnach) had been standararised i.e. January and February, respectively.



Fig.28.Collection of Mucuna fruits with ruptured bamboo stickFig. 29. Destructive processing of Mucuna fruits

"Identification of prominent locations and best populations of *Terminalia chebula* (Harra) and *Anogeissuslatifolia* (Dhawda) in Madhya Pradesh in terms of their active chemical ingredients".

Morphological data (length, width and weight) of fruits of *Terminalia chebula* (Harra) collected from 16 ranges of 02 forest divisions South Balaghat and North Balaghat of Madhya Pradeshwere recorded. Harrafruits were processed to make "*Kachariya*" and powdered. Powdered fruit samples were analyzed for tannin and gallic acid contents. Total tannin content though spectrophotometer and gallic acid content through HPLCwere evaluated for Harra fruits of 44 locations. The content of gallic acid in 44 samples varied from 0.83±0.01 26±0.18. The gum of *Anogeissus latifolia* (Dhawda) was collected from Alirajpur forest division and categorized into grades for further phytochemical study.



"Selection of CPTs, standardization of collection practices and quality evaluation of Gum karaya (*Sterculariaurens*) in Chhattisgarh state".

Experiments were laid out on trees of 03 girth classes (Group A- 90to 140 cm; Group B-141 to 190 cm and Group C- > 191 in Janjgir -Champa and Manendragarh forest areas of Chhattisgarh state. Trees were tapped mechanically with different techniquesi.e.traditionaland semi-arc blaze techniques to standardize the sustainable harvesting technique in the months of March, April, May and June. Observations shows that the yield of gum is directly proportional to the girth of the tree. A validated HPTLC Method was developed for quantitative evaluation of glucuronic acid in gum samples which can be used to quality standardization of gum Karaya along with BIS parameters such as pH, viscosity, volatile matter, ash and foreign matter.

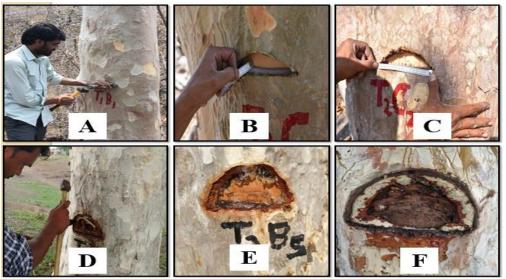


Fig.32.A: Blazing the tree with die , **B&C:** Length, width anddepthof initial blaze on *Sterculiaurens* tree, **D:**Refresheningof blaze (1.5 - 5 mm), **E:**Gum oozing from theblaze, **F:**Fillingoftheblaze.

"Investigations on active chemical ingredients and propagation of critically endangered species *Dillenia pentagyna* Roxb. for its conservation in Madhya Pradesh".

Populations of critically endangered *Dilleniapentagyna*Roxb. was identified in 07 forest divisions of Madhya Pradesh. 10 different seed treatments (GA3 – 100 ppm; GA3 – 300 ppm; GA3 500 ppm; Hot water; cold water, Cow-dung slurry; Conc. H_2SO_4 ; Conc. H_2SO_4 – 40% and control) and 5 potting media (Soil: Soil: FYM – 2:1:1; Soil: Sand – 2:1; Cocopeat: Soil: Sand – 1:1:1; Soil: Sand – 1:1) were used.Preliminary results shows 12% germination of seeds treated with GA3 300 ppm for 24 hours. Experiments for vegetative propagation were also laid out to standardize the propagation technique. Preliminary study reveals 20% rooting if treated with IAA 500 ppm for 4 hr and IAA 1000 ppm for 2 hr. Total secondary metabolites i.e. alkaloids, phenols & flavonoids were also estimated in all collected plant parts of the species. A validated HPTLC method was developed for simultaneous determination of betulinic acid, β -sitosterol and lupeol in fruits, leaves, roots and stem bark of *Dilleniapentagyna*Roxb.



Fig.33. Adventitious rooting in *Dilleniapentagyna*

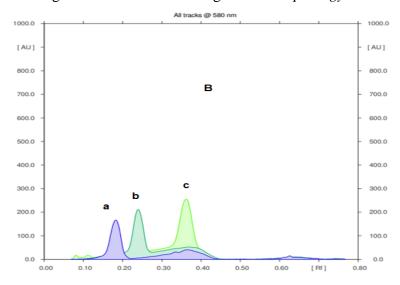


Fig. 34.HPTLC Chromatograms of BA (a), BS (b) and LU (c) standards

"Exploration of adhesive materials for incense sticks from the plant species".

Leaf of *Delbergia latifolia*, Bark of *Bombax cieba* and Seed of *Cassia tora* found good for alternate source for preparation of Jiggat.





Fig. 35. Preparation of Jiggat

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

Herbal Mosquito repellentwere developed and results were validated by NABL accredited lab. More than 90% repellency was observed in 10 different samples. Further work on testing of standard parameters is under progress.

2.6.5 Bio-fuels and Bio-energy

2.7 Forest Protection

2.7.1 Overview

2.7.1.1 Projects under the Theme (in table as given at 2.1.1.1)

Projects	Completed Projects	Ongoing Projects	New Projects Initiated During the Year
Plan	01	00	-
Externally Aided	03	00	01

2.7.2 Insects pests, diseases and control

"Development of delivery system for field application of *Canthecona furcellata* biological control agent against major insect pests"

A field experiment was conducted to evaluate the predatory potential of Cantheconafurcellata against Hyblaeapuera, Eutectonamacheralis and Helicoverpaarmigera in Teak nursery at Kanchangaon range (Mandla) and Chick pea crop at Para village (Bargi), Jabalpur. M.P. Results revealed that the first instar larvae were not feeding on all the three hosts due to their zoophytophagous nature. At fifth nymphal instar maximum per cent predation of 84.95 per cent was observed in *E. macheralis* larvae followed by on larvae of *H. armigera* with 83.39 per cent predation and minimum per cent predation 74.37 per cent on *H. puera* larvae. Results reflect that *C. furcellata* could safely be used as potential bio-control agent in pest management programme of major larval defoliator pests in teak and Chick pea.

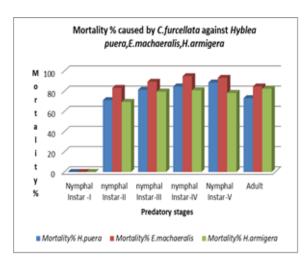




Fig. 36. Field release of Cantheconafurcellata against key defoliator pest of teak



Fig. 37. Recorded larval consumption of C. furellata on E. machaeralis under field conditions



Fig. 38 Mass multiplication of host Culture of C. cephalonica&C. furcellata

"Extension of biological control of Teak defoliator and skeletonizer through egg parasitoid, *Trichogramma raoi* (TFRI- Trichocards) in plantation".

Host rearing of biological control agents *Canthecona furcellata* and egg parasitoid *Trichogramma raoi* production for the preparation of TFRI- Trichocardswere prepared for requirements raised by the stakeholders and 7 Lakhs egg parasitoids were released in experimental site against Teak defoliator and skeletonizer. 12 trainings programmes to popularize biorational and ecofriendly insect pest management and to improve the environmental quality,on "Biological Control of Teak Skeletonizer / Defoliator insects" were organized for the Frontline Staff of six forest division (Korba, Katghora, Sarguja, Ambikapur, Khairagad and Rajanandagaon) of CG State Forest Department.

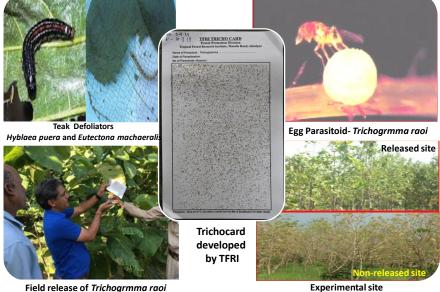


Fig. 39. Mass culturing of T. raoi



Fig. 40. Field demonstration of management of Teak defoliator /skeletonizer through TFRI Trichocard

Biological control of teak defoliator through TFRI Trichocard



Field release of Trichogrmma raoi

"Monitoring and dissemination of knowledge to manage sal heartwood borer. Hoplocerambyxspinicornis in Chhattisgarh".

Surveyed and monitored the status of sal heart wood borer *Hoplocerambyx spinicornis* infestation in sal forest at Kondagaon, Keskal, Bhanupratppur, Ghariyaband and Kawardha forest divisions of C.G. The enumeration of borer affected trees was done in all the selected sites where sal forests and borer occurred, based on the types/categorization and girth size. Information on borer incidence was also collected from different related forest divisions. Laid tree traps in the selected sites and demonstrated categorization of borer affected trees and trap tree operation for management of borer beetles.

Data on sal borer incidence revealed that a total of 1070 sal trees were affected during the year 2021. Eight trainings on "Management of Sal heart wood borer *H. spinicornis*" Conducted for the Frontline Staff of six forest division (Korba, Kawardha, Kondagaon, East bhanupratapur, Sarguja, Ambikapur, and Rajanandagaon) State Forest Department of Chhattisgarh wherein 200 peoples were trained. Feedback was also taken from the participants of the training programme to compile the valuable and important suggestions in future training.



Fig. 41. Survey and monitoring of sal heart wood borer at sal forest, Compt. no. RF/353, Beat- Supkhar,Range – Rengakhar, Division- Kawardha



"Capacity building of nursery staff on preparation of organic fertilizer and its application".

Conducted 35 hands on practical trainings entitled" Preparation and application of biofertilizers in forestry" for field staffsof six circles, Chhattisgarh and 921officials attended the training programme.



Fig:42. Powerpoint presentation and Practical Demonstration During training program.

- 2.7.3 Mycorrhizae, rhizobia and other useful microbes
- 2.7.4 Weeds and Invasive species

"Impact of Lantana Camara removal in Chhattisgarh State".

To assess the impact of *Lantana camara* removal on local biodiversity, regeneration status, soil physical and chemical properties, micro fauna and seed bank status in soil, NTFP/medicinal plants collection, fire incidents, three forest divisions *viz.*, Balrampur (Northern Hilly zone), Marwahi (Chhattisgarh plains zone) and Bastar (Bastar Plateau zone) have been selected as representative divisions of three agro-climatic zones of Chhattisgarh and established permanent plots withhigh, medium and low infestation areas and collected detailed information of the sites. Soil samples from each site have also been collected from three depths (0-15, 16-30 and 31-45 cm) and analyzed the chemical properties (EC, pH, N, P, K and Organic Carbon).



Fig. 43. Laying quadrats for vegetation sampling



Fig. 44. Collection of Soil Samples from selected site



Fig. 45. Field Site Evaluation: TFRI team with Chhattisgarh Forest Department

2.7.5 Forest Fire and Grazing

3. Education Vistas/Activities

- 3.1 FRI University (Applicable for FRI, Dehradun only)
- 3.2 HRD Trainings Organized : Topics must be indicated in annexure while providing numerical information in the table given below:

Sl.	No. of	Duration	No. of participants
No.	Trainings	(in days)	
1	02	10	57

Note: Please indicate in numerals i.e. 1, 2, 3...n only. Please DO NOT write oneweek, six months etc.

- ★ Please provide details of HRD trainings in the given format as annexure -6 (HRDTrainings)
- 3.3 Visits Abroad Nil
- 3.4 Participation in Seminars/Symposia/Workshops/Trainings

No of Seminars/Symposia/	Duration	No. of
Workshops/Trainings	(in days)	participants
163	315	14413

★ Please provide details in the given format as annexure-7 (participation in Workshops etc.)

4. Extension Panorama/Activities

- National Forest Library and Information Centre (NFLIC) (Applicable for FRI, Dehradun only)
- Environmental Information System (ENVIS) (Applicable for FRI, Dehradun & IFGTB, Coimbatore only)
- 4.1. Trainings Organized : Topics must be indicated in text while providing information in the table given below

No. of	Duration	No. of participants					
Trainings	(in days)						
a. Trainings under VVK							
-	-	-					
	b. Trainings under DV						
-	-	-					
	. Trainings under GSD)P					
-	-	1					
d. Other t	d. Other trainings (excluding HRD trainings)						
43	74	1696					
Grand Total	Grand Total	Grand Total					
43	74	1696					

Note: Please indicate in numerals i.e. 1, 2, 3...n only. Please DO NOT write one week, six months etc.

★ Please provide details of trainings in the given format as annexure -6 (A) (Extension Trainings)

4.2 Report on the activities performed under following:

4.2.1 Van Vigyan Kendras (VVKs) –

- 1. MoU sign between TFRI, Jabalpur and State Forest Department, Chhattisgarh for smooth functioning of newly established Van Vigyan Kendra at Metaguda Nursery, Jagdalpur (C.G.) on 14/09/2021.
- 2. Extension material published by TFRI has been handed over to VVK, Jagdalpur.





Fig. 46. श्री सौरम सिंह ठाकुर वन मंडलाधिकारी (अनु. एवं विस्तार) एवं डॉ. एस. सर्वानन, प्रभागाध्यक्ष, वन विस्तार प्रभाग उवअसं, जबलपुर समझौता ज्ञापन (MoU) हस्ताक्षर करते हुए





स्थल निरीक्षण करते एवंवन प्रचार सामग्री वन मंडलाधिकारी को सौपते

- 3. VVK Raipur has been inspected by the Head, Forest Extension Division, TFRI on 15/09/2021.
- 4. Rs. 13 Lakhs were released to VVK at Jagdalpur develop model nursery and procurement of equipments.









Fig. 47. वन विज्ञान केन्द्र खत्तीसगढ रायपुर में उपलब्ध सुविधाओं का निरीक्षण करते डॉ. एस. सर्वानन, डॉ. एस. एन. मिश्रा एवं श्री एच.डी.बी. एन्थोनी

4.2.2 Demo Village (DV)

- Nil

4.2.3 Tree Growers Mela (TGM) - Interaction with farmers in Kisaan Mela

Institute	Participated/organized	Duration	Place
TFRI, Jabalpur	TFRI Organized Kisan Mela in	01 day	Krishi
and FRC-SD,	collaboration with NABARD	11/03/2022	Vigyan
Chhindwada	&ICFRE at KVK, Mandla (M.P.)		Kendra,
			Mandla
			(M.P.)
TFRI, Jabalpur	TFRI, Jabalpur and FRC-SD	22 - 26 December,	Bhopal
and FRC-SD,	Chhindwara actively participated in	2021	(MP)
Chhindwada	'International Herbal Fair'		
	Bhopal Organized by M.P. State		
	Minor Forest Produce (Trading &		
	Development) Cooperative		
	Federation.		
TFRI, Jabalpur	TFRI, Jabalpur and FRC-SD	24-27th	Nagpur
and FRC-SD,	Chhindwara actively participated in	December,2021	(MS)
Chhindwada	'Agro-vision' at Nagpur,		
	Maharashtra.		

Participation in the Inauguration of *Ayush Van* Establishment at Amarkantak on 09 Oct 2021

4.2.4 Prakriti - Nil

- 1. FRC-SD Chhindwara conducted awareness training programme "Avoid the Use of Single Use-plastic" under Azadi ka Amrut Mahotsav by the centre to the Students on 8/10/2021 at Navodhya in Singori village, Chhindwara district Madhya Pradesh.
- 2. An awreness programme conducted on 07 .02.2022 in Navodaya Vidyalaya, Singodi. 40students of 10th Standard participated in the event. During the period field visit was conducted for identification, uses and botanical names of various medicinal/aromatic/shrub/tree species. Information was delivered to the students and feedback was obtained.
- 4.3 Technologies transferred- A brief write up with suitable photographs on <u>Efforts made on extension</u> /commercialization of the following:

4.3.1. Clones/Varieties released (species wise):

Plants of both varieties of *Rauvolfia serpentina*were prepared and sold to ChhatissgarhMedicinal Plant Board

4.3.2. Packages of practices developed (species wise)

4.3.3. Products developed

Under the ongoing research project ID No.281/TFRI/2021-22/FRCSD-2/ICFRE/24) funded by ICFRE, Dehradun

Herbal Mosquito repellentAgarbatti stickswere developed. More than 90% repellency was observed in 10 different samples. Further work on testing of standard parameters is under progress.

4.3.3. QPM produced and supplied to stakeholders (species wise) –

QPM of different species of Bamboos viz. Bambusa nutans, B. tulda, B. vulgaris var. green, B. vulgaris var. yellow

4.3.5. Patented technologies

4.3.5. License/Material Transfer Agreement signed-.

Please provide details in the given format as annexure -11 (MTA details)

4.4 Intellectual Property - Patents Granted/Applied (during the year), any other information regarding IP

4.4.1 Patents granted/applied for: nil

4.4.2 Others

4.5 Research Publications: Please provide information in the table given below (Numbers only):

Books	Booklets/	Article in Seminars/		Popular	Research Papers in Journals		Chapters
	Brochure/	Conferences/		Article			in Books/
	Bulletins/	Workshops etc.					Proceeding
	Phamphlets	Articles	Abstracts		Foreign	Indian	S
1	5	-	28	21	16	37	3

Note – List of books along with photograph of cover page are to be submitted separately.

*Please provide a list (with subheads as in 4.5 above) of all the publications (in the manner of enlisting references as followed in the Indian Forester) including impact factor (in case of research papers only) as annexure -10 (publications)

4.5 Seminars/Symposia/Workshops Organized

No. of Seminars/Symposia/ Workshops/	No. of days	No. of
meetings organized		participants
11	10	581

* Please provide details in the given format as annexure -8 (seminars etc. organized)

4.6.1 Awareness /Demonstration programmes organized

No. of Awareness/ Demonstration	No. of days	No. of
programmes organized		participants
25	27	1159

* Please provide details in the given format as annexure -9 (seminars etc. organized)

4.6 Consultancies -

S.No	Consultancy	User agency						
1.	Development of SOP for developing Quality Planting	Odisha SFD						
	Material (QPM) of forestry species in Odisha,							
2.	Monitoring of NTPC Ltd. Accelerated afforestation	NTPC						
	programme of plantation of 10 million tress – In seven							
	states (M.P. and Maharashtra)							
3.	Implementable forestry research for ash utilization	Adani Power						
	promotion and development of research park at	Maharashtra						
	APML, Gondia	Limited,						
		Maharashtra						
4.	Pilot study on Raising short rotation forestry crops for	Odisha Mining						
	intermittent periods at Dubna-Sakradhi Iron and	Corporation						
	manganese ore mines in Keonjhar district of Odisha".	Limited, Odisha						
5.	Study of flora and fauna and preparation of Wildlife	SECL						
	Conservation Plan including endangered species if							
	any and comprehensive study of the impact of mining							
	on the wildlife for Rajendra UG and Damini mine,							
	SECL Sohagpur Area (Madhya Pradesh)							
6.	Preparation of Wildlife Conservation Plan for	SECL						
	Endangered Species found in and around Dhelwadih							
	UG, Bagdeva UG and Singhali UG mines of DSB Sub							
	Area, SECL Korba Area (Chhattisgarh)							

4.7 Technical Services

4.7.1 Identification and testing services

4.7.2 Advisories given to SFDs and other stakeholders –

- 1. Suitable recommendations suggested for white grub infestation in teak nursery at kanchangaon range, M.P. on 18.8.2021.
- 2. Suitable recommendations suggested to manage sal heartwood borer outbreak in sal forest at Kondagaon range, C.G. on 21.12.2021.
- 3. An advisory (16-11-21) was issued for effective control measuresfor drying of teak seedlings and infestation of teak skeletonizer, termite attack in plantation at Durgapur, Bargi and Saliwada, Jabalpur.

4.7.3 Other technical services not covered elsewhere in the report

4.8 Activities of Rajbhasha -

- 1. Scheduled activities like review and quarterly meetings were organized
- 2. Various competitive programmes were organized during Hindi Pakhwara in Sepember 2021.
- 3. TFRI received award from TOLIC, Jabalpur for commendable work of Hindi implementation in this institute etc during 2021-22





Fig. 48. Rajbhasha activities were conducted at the TFRI, Jabalpur during year 2021-22

4.9 Awards and Honours -

Awards:

- 1. Dr. Naseer Mohammad, Scientist-D received "ICFRE Young Professional Award 2020" for outstanding contribution.
- 2. Shri Kaushal Tripathi, Scientist-B received Prof. S.N. Chaturvedi medal for best research paper presentation during Conference of Indian Botanical Society from 18-20 Oct. 2021 held at Jai Narayan Vyas University, Jodhpur.
- 3. Shri Kaushal Tripathi, Scientist-B received Young Scientist Award 2021 by the Society of Biological Sciences and Rural Development on the occasion of International conference on Emerging sustainability trends in Agriculture, Rural and environmental development, 19-20 Dec. 2021.

- 4. TFRI receieved Awarded for Hindi Rajbhasha Award on 23rd December, 2021.
- 5. Dr. Mohan C, Scientist-B, received Scientists of the year award 2021 on the occasion of International Conference on emerging sustainability trends in "Agricultural, Rural and Environmental development" (19-20th Dec, 2021) organized by Society of Biological Sciences and Rural Development, Allahabad. U.P.
 - 4.10 Special Activities (Such as Van Mahotsava, Forestry Day and Other occasions)-
- 1 Celebrated **International day of biodiversity** on 22-05-2021
- 2 Celebrated World Environment Day, 2021 on 05-06-2021
- 3 Plantation was carried out in TFRI, Jabalpur on celebration of Van Mahotsav on 06/07/2021.
- 4 TFRI, Jabalpur and FRC-SD, Chhindwara celebrated Independence Day, 2021.
- 5 FE&CC division Organized "2nd week of Bharat Ka Amrut Mahotsav" with the theme "Biodiversity and Climate Change" from 2-08-2021 to 8-08-2021
- 6 TFRI observed Parthenium Week from 16th to 22nd August, 2021.
- 7 TFRI observed Worl Bamboo Day on 18th September, 2021.
- 8 An awareness programme "Avoid the Use of Single Use-plastic" under Azadi ka Amrut Mahotsav by the centre to the Students on 8/10/2021 at Navodhya in Singori village, Chhindwara district Madhya Pradesh
- 9 Swachhata Abhiyan observed at TFRI on 13th October, 2021.
- 10 TFRI observed Vigilance Awareness on 28th October, 2021.
- 11 Tropical Forest Research Institute, Jabalpur celebrated the Birth Anniversary of Birsa Munda on 17.11.2021 at Rani Durgawati Samadhi Sthal, Gram Barha, Jabalpur, Madhya Pradesh.
- 12 Forest Research Centre for Skill Development, Chhindwara celebrated the Birth Anniversary of Birsa Munda on 18.11.2021 at Thanakhede village, Chhindwara, Madhya Pradesh.
- 13 Celebrated Rivers of India" under Azadi ka Amrit Mahotsav on 29th December, 2021.
- 14 TFRI, Jabalpur and FRC-SD, Chhindwara celebrated Republic Day, 2022.
- 15 TFRI celebrated Woman's Day on 8th March, 2022.
- 16 Science quiz prgramme and Rangoli competition organized during the celebration of **International Day of Forests on 21 March 2022**

4.11 **Extension Activities performed under CAMPA Extension** (this information is different from the information provided in the Chapter as above)

5. Administration and Information Technology

Introduction

- 1.1 Information Technology
 - All the virtual meetings have been organized through VC end point, Webex, googlemeet, Zoom, Microsoft Teams for trainings, workshops, seminar, Inhouse meetings and meetings with headquarter and other organizations throughout the year.
 - The web pages of institute's website (http://tfri.icfre.org) and social media accounts of institute's satellite centre have been updated with latest information on regular basis throughout the year. The social media accounts like YouTube, Facebook, Twitter, Instagram, Koo have been created and integrated with website for ease of access.
 - The online open access e-magazine 'Van Sangyan' (ISSN 2395 468X), and journal "Indian Journal of Tropical Biodiversity" published by the institute is linked with institute's web site.
 - Reports have been generated for all the activities undertaken at the institutes level
 conferences/seminars/workshops/trainings/visits of dignitaries/visits etc. are uploaded on institute's web site and also sent to the headquarter for uploading over ICFRE website.
 - Various networking facilities extended within the institute. All the circulars, notifications, office orders, proceedings of monthly seminars and other documents have been regularly uploaded over the Online Office Records (Order /MoM / Agenda etc.) System for wider circulation.
- 1.2 Administration: A brief note on general administration activities along with information on the following:

Recruitment and promotions etc. during the year: 2021-22

(A) New appointment during 2021-22:-

(ii) Scientist - 01(Shri Manish Kumar Vijay appointed as Sci-B)

(iii) Technical services - Nil (iv) Ministerial staff - Nil

Promotion during 2021-22:-

(B)

(i) Scientist - 06 (ii) Technical services - 02 (iii) Ministerial staff - Nil

	r .	T	T	<u> </u>					
	S1.	Name of Scientist/Technical	Present post	Promoted post					
	No.	staff/min. staff							
	Scienti	ete							
	1	Dr. Fatima Shirin	Scientist-F	Scientist-G					
	2	Dr. Nanita Berry	Scientist-E	Scientist-F					
	3	Dr. Rajkumar M.	Scientist-C	Scientist-D					
	4	Shri Dheeraj Kumar	Scientist-C	Scientist-D Scientist-D					
	5	Dr. Pramod Kumar	Scientist-C	Scientist-D					
	6	Smt. Mamta Meshram	Scientist-B	Scientist-C					
	Techni		Scientist-D	Scienusi-C					
	1	Shri I.T.K. Dilraj	STO	ACTO					
	2	Shri Satish Sahu	TO	ACTO STO					
	Minist		10	310					
	Minist								
(0)		Nil							
(C)		ferred during 2021-22 :-	02						
	(i)	Scientist - Technical services	02 - Nil						
	(ii)								
	(iii)	Ministerial staff - Name of Scientist/Technical	01	T. (D1)					
	Sl. No.	staff/min. staff	From (Place)	To (Place)					
		Scientist							
	1	Smt Neelu Singh, Scientist-G	FRI, Dehradun	TFRI					
	2	Dr. S. Saravanan, Scientist-F	TFRI	IFGTB,					
		ŕ		Coimbatore					
	Techni	ical	•	-					
		Nil							
	Minist	erial	-	1					
	1	Shri N.K. Gupta	TFRI	IFP, Ranchi					
(D)	Retire	ed during 2021-22 :-	-	,					
	(i)	Scientist -	01						
	(ii)	Technical services	- 02						
	(iii)	Ministerial staff -	Nil						
	Sl.	Name of Scientist/Technical	Post						
	No.	staff/min. staff							
	Scienti	ists							
	1	Smt. Shalani Bhowate	Scientist-C	V.R.S.					
	Techni		•	•					
	1	Shri L.R. Murhekar	STO						
	2	Shri A.K. Thakur	TO						
	Minist	· L	I						
		Nil							
1	1								

- 5.2.1 Sevottam: Activities relating to the Citizens/Clients Charter as detailed below has to be included in the Annual Report.
- 5.2.1.1Action taken to formulate the Charter for the Department and its subordinate formation;(**In case the Charter is yet to formulate**)
 - 5.2.1.2 Action taken to implement the Charter;
 - 5.2.1.3 Details of Training Programmes, Workshops, etc. held for proper implementation of Charter;(this is not the same as provided in chapter no. 4.3 and 4.4. Trainings organized for implementation of charter only is to be given)

5.2.1.4 Details of publicity efforts made and awareness campaigns organized on Charter for the Citizen/Clients; (awareness campaigns organized for charter only)

NIL

5.2.1.5 Details of **internal and external**<u>evaluation of implementation of Charter</u> in the Organization and assessment of the level of satisfaction among Citizen/Clients.

Evaluation of implementation of charter is to be initiated.

5.3Welfare measures for the SC / ST/ backward / minority communities

- Trainings were conducted in tribal areas for awareness about medicinal plants and their uses.
- The interest of the above section are being safeguarded and as per the guidelines of Government of India a Liaison Officer is in position who monitors the promotion / recruitment as per the roster.

5.4 Welfare measures for women

5.4. HR News

2. Annexure

1. RTI: In TFRI, Jabalpur 44 cases with regard to RTI were received during the year 2021-2022 and 41 cases were disposed within stipulated time period.

2.

Names and Addresses of Public Information Officers and Appellate Authorities under the Right to Information Act 2005 in the Institute

Headquarter / Institute	Appellate	Public Information	Subject matter(s)
	Authority	Officer	allocated
Tropical Forest Research Institute, Jabalpur	Director, TFRI, Jabalpur	Shri AJK Asaiya, Scientist-C, TFRI, Jabalpur	As per provision and guidelines provided under RTI Act, 2005.
1		1	,
Centre for Forestry	In-charge Scientist,	In-charge Scientist,	As per provision and
Research & Human	CFRHRD,	CFRHRD,	guidelines provided
Resource Development, Chhindwara	Chhindwara	Chhindwara	under RTI Act, 2005

- 3. Information on vigilance cases **NIL**
- 4. Information on audit objections NIL

5. Email and Postal addresses:

Director

TROPICAL FOREST RESEARCH INSTITUTE

(Indian Council of Forestry Research & Education)

P.O. – R.F.R.C, Mandla Road, Jabalpur – 482021 (M.P), India

Phones: 0761 – 4044002, 2840483(O), Fax: 0761 – 4044002, 2840484

E-mail – dir_tfri@icfre.org

Scientist In-charge,

Centre for Forestry Research & Human Resource Development

(Indian Council of Forestry Research & Education)

Poama, P.O- Kundalikala, Parasia Road, CHHINDWARA - 480 001 (M.P)

Phones: 07162 – 292061 (O)

e-mail: head cfrhrd@icfre.org/dir cfrhrd@rediffmail.com

6. LIST OF ABBREVIATIONS

AICRP – All India Coordinated Research Project

AM – Arbuscular Mycorrhiza

APML – Adani Power Maharashtra Limited

ARS – Agriculture Research Services

BA – Benzyl Adenine

BIS – Bureau of Indian Standards

CAMPA – Compensatory Afforestation Fund Management and Planning Authority

CCF – Chief Conservator of Forests

CEO- Chief Executive Officer

CG – Chhattisgarh

CGM- Chief General Manager

CPT- Candidate Plus Tree

CRIDA – Central Research Institute for Dry Land Agriculture

CSO – Clonal Seed Orchard

DDM – Deputy Development Manager

DFO – Divisional Forest Officer

DNA -Deoxyribonucleic acid

DPR – Detailed project report

EAP- Externally Aided Project

ESIP – Earth Science Information Partners

ESIP – Ecosystem services improvement project

FGP – Final Germination Percentage

FRCSD – Forest Research Centre for Skill Development

FRI – Forest Research Institute

FSI – Forest Survey of India

GBH – Girth at Breast Height

GIS – Geographical Information System

GPS – Global Positioning System

GRI – Germination Rate Index

GSDP – Green Skill Development Programme

HoFF – Head of Forest Force

HPLC – High Performance Liquid Chrometography

HPTLC – High Performance Thin Layer Chrometography

HRM – Heat Ratio Method

IAA – Indole Acetic Acid

IBA – Indole Butyric Acid

ICAR – Indian Council of Agricultural Research

ICFRE – Indian Council of Forestry Research and Education

IFRIS – Integrated Forest Resource Information System

IFS – Indian Forest Service

IPM – Integrated Pest Management

JNKVV – Jawaharlal Nehru Krishi Vishwavidyalaya

JNV – Jawahar Navodaya Vidyalaya

KVK – Krishi Vigyan Kendra

MoEF&CC - Ministry of Environment, Forests and Climate Change

MoU – Memorandum of Understanding

MP – Madhya Pradesh

MPCA - Medicinal Plant Conservation Area

MPCST – Madhya Pradesh Council of Science and Technology

MPFDC – Madhya Pradesh Forest Development Corporation

MPSFD – Madhya Pradesh Forest Department

MS – Murashige and Skoog

MS – Maharashtra

NAA – Napthyl Acetic Acid

NABARD – National Bank for Agriculture and Rural Development

NGO – Non Government Organisation

NPC- National Project Coordinator

NTFP – Non-Timber Forest Produce

NTFPs – Non Timber Forest Products

NTPC – National Thermal Power Corporation

NWFP - Non Wood Forest Produce

PCCF – Principal Chief Conservator of Forests

PIMC – Project Implementation and Monitoring Committee

PIO- Public Information Officer

PMS – Payroll Management system

PSB – Phosphate Solubilizing Bacteria

PSP – Permanent Preservation Plots

QPM – Quality Plantig Material

RAG – Research Advisory Group

RFRC – Regional Forest Research Centre

RIMS – Research Information System

RSP – Rourkela Steel Plant

RTI – Right to Information

SC – Schedule Caste

SECL – South Eastern Coalfields Limited

SHGs – Self Help Groups

SPA – Seed Production Area

SSO - Seedling Seed Orchard

ST – Schedule Tribe

TFRI – Tropical Forest Research Institute

TSG – Time Spread of Germination

TSO – Teak Seed Orchards

UNDP-GEF - United Nations Development programme - Global environment facility

VVK – Van Vigyan Kendra

			Trainings org	anized					
SN	Topic	Duration and period		Participants		Overall feedback			
		Days	Date	Category	Numbers	Participan			
	a. Trainings under VVK								
1.			Nil						
		b.	. Trainings u	nder DV					
1.			Nil						
		c. 7	Trainings un	der GSDP					
1.			Nil						
		(43 Train		and 1696 participants)(excep					
SN	Topic	Days	Date	Category	Numbers	Overall feedback o Participan			
(1)	Seed technology developed by ICFRE' for the forest officials of Madhya Pradesh and Chhattisgarh States	1 day	25/06/2021	SFDs, MP & CG	25				
(2)	Nine one day training programme on "Biological control of Teak defoliator and skeletonizer through TFRI-Trichocard"	9 days	Korba (01/07/21) Kawardha (02/07/21) Kawardha (03/07/21) Kawardha (12/07/21) Gariyaband (14/07/21) East Bhanuprata ppur (15/07/21) Bastar (16/07/21) Datewada and (17/07/21) Kondagaon divisions (19/07/21)	for the front line staff in eight different Forest Divisions of Chhattisgarh Forest Department	(Each training)	Satisfactory			
(3)	Six one day training programme on "Management of Sal borer (Hoplocerambyx spinicornis) in	6 days	Korba (01/07/21) Kawardha	for the front line staff of different Forest Divisions of Chhattisgarh State	30 (Each training)				

	Col (Changa nahugta)?		(02/07/21)	Forest Department		
	Sal (Shorea robusta)"		` /	Forest Department		
			Kawardha			
			(03/07/21)			
			East			
			Bhanuprata			
			ppur			
			(15/07/21)			
			Bastarand			
			(16/07/21)			
			Kondagaon			
			divisions			
			(19/07/21)			
(4)	three trainings "Management of	03 day	05/08/2021	Front line staff of Chhatti	(Each	
(4)	Sal heartWood borer	os day	to	State Forest Department	training)	
	(Hoplocerambyxspinicornis) in sal		07/08/2021	State 1 ofest Department	25	
	(Shorearobusta)" at Keshkal		07/06/2021		23	
	Forest Division, Chhattisgarh,					
	Kanker Forest Division,					
	Chhattisgarh, and Bhanupratappur					
	Forest Division, Chhattisgarh.					
(5)	"Introduction to Basic Forestry"	02 days	16/08/21 to	Students ,Social activists,	141	
	for stakeholders other than State		17/08/2021	SFD _s , M.P., and frontline		
	Forest Department.			Staff		
(6)	Introduction to Basic Forestry for	2 days	16-17	Students, researchers,	87	Highly
	other stakeholders-Through virtual		September,	NGOs etc.		satisfactory
	modes		2021			
(7)	"Biological control of Teak	01 day	23/09/2021	Korba, frontline	25	
(1)	defoliator and skeletonizer through	01 day	23/07/2021	StaffChhattisgarh Forest	23	
				<u> </u>		
	· · · · · · · · · · · · · · · · · · ·			Department		
(0)	Chhattisgarh.	01 1	24/00/2021	Vataliana forution	25	
(8)	"Biological control of Teak	01 day	24/09/2021	Katghora, frontline	25	
	defoliator and skeletonizer through			StaffChhattisgarh Forest		
	TFRI-Trichocard" at Katghora,			Department		
	Chhattisgarh.					
(9)	"Training programme on capacity	2 Days	26/09/2021	Forest officers, Scientists	30	
	building of Madhya Pradesh and		to	and scholars.		
	Maharashtra Forest Department		27/09/2021			
	for developing State REDD+					
	action Plans.					
(10)	'Gmelina with Betel vine based	01 day	27/09/2021	Farmers	20	
	agroforestry system in Madhya					
	Pradesh'					
(11)	"Avoid the Use of Single Use-	01 day	05/10/2021	Youth People	25	
	plastic"			*		
(12)	"Avoid the Use of Single Use-	01 day	08/10/2021	School Students	80 & 56	
()	plastic" In two session.					
(13)	Workshop for Capacity Building	2 days	26-27	State Forest Officials from	30	Highly
	of State Forest Departments for		October,	State of M.P. and		satisfactory
	Developing State REDD+ Action		2021	Maharashtra		
	Plans		2021	Triania asina		
	1 10115					

(14)	"Training on	3 days	27/10/2021	Researchers', Students	18	
(- 1)	Instrumentation"(Online)		to			
			29/10/2021			
(15)	"Cultivation, Processing	05 days	22/11/2021	Technical Staff of ICFRE	30	
	techniques and Management of		26/11/2021			
	Non-wood Forest Products					
(16)	including Medicinal Plants "Climate Change Carbon	02 days	15/12/2021	officers of Adani power	35	
(10)	Sequestration Increasing Green	02 days	16/12/2021	Maharashtra ltd	33	
	Cover and Utilization of Fly Ash"		10/12/2021	Walter and The Control of the Contro		
(17)	Online training program on	5 hours	21/12/2021	State Forest department,	88	
, ,	"Propagation of Forestry species"			Scientists and technical		
				officers		
(18)	Six one day training programme	06 day	21/12/2021	front line staff	(i)27	
	on "Management of Sal Heart		(Kondagoan	Chhattisgarh Forest	(ii)15	
	Wood Borer <u>Hoplocerambyx</u>		, Amabeda, and	Department.	(iii)11	
	<u>spinicornis</u> "		Bhanuprata		(iv)10 (v)15	
			ppur)		(vi)10	
			23/12/2021		(11)10	
			(Mainpur)			
			25/12/2021			
			(Navagarh)			
			26/12/2021			
			(Gariyaband)			
(10)	On line Training Program on	7 40770	1 05/01/2022	C - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	1 1 2 2	
(19)	On line Training Program on	2 days	05/01/2022	Scientists, Foresters,	132	
(19)	"Plant Biotechnology"	2 days	to	Academicians and	132	
,	"Plant Biotechnology"	•	to 06/01/2022	Academicians and Students		
(20)	"Plant Biotechnology" online training programme on	01 day	to	Academicians and Students B.Sc and M.Sc Students	45	
,	"Plant Biotechnology"	•	to 06/01/2022	Academicians and Students		
,	"Plant Biotechnology" online training programme on	•	to 06/01/2022	Academicians and Students B.Sc and M.Sc Students of Danielson College,		Excellent
(20)	"Plant Biotechnology" online training programme on "Biodiversity Conservation"	01 day	to 06/01/2022 13/01/2022	Academicians and Students B.Sc and M.Sc Students of Danielson College, Chhindwara ICFRE Technical Staff.	45	Excellent
(20)	"Plant Biotechnology" online training programme on "Biodiversity Conservation" "Nursery development and vegetative propagation" online training programme on	01 day	to 06/01/2022 13/01/2022 17/01/2022-	Academicians and Students B.Sc and M.Sc Students of Danielson College, Chhindwara ICFRE Technical Staff. B.Sc and M.Sc Students	45	Excellent
(20)	"Plant Biotechnology" online training programme on "Biodiversity Conservation" "Nursery development and vegetative propagation"	01 day	to 06/01/2022 13/01/2022 17/01/2022- 21/01/2022	Academicians and Students B.Sc and M.Sc Students of Danielson College, Chhindwara ICFRE Technical Staff. B.Sc and M.Sc Students of ATASH College of	45	Excellent
(20)	"Plant Biotechnology" online training programme on "Biodiversity Conservation" "Nursery development and vegetative propagation" online training programme on	01 day	to 06/01/2022 13/01/2022 17/01/2022- 21/01/2022	Academicians and Students B.Sc and M.Sc Students of Danielson College, Chhindwara ICFRE Technical Staff. B.Sc and M.Sc Students of ATASH College of Management &	45	Excellent
(20)	"Plant Biotechnology" online training programme on "Biodiversity Conservation" "Nursery development and vegetative propagation" online training programme on	01 day	to 06/01/2022 13/01/2022 17/01/2022- 21/01/2022	Academicians and Students B.Sc and M.Sc Students of Danielson College, Chhindwara ICFRE Technical Staff. B.Sc and M.Sc Students of ATASH College of Management & Technology, Pandhurna	45	Excellent
(20) (21) (22)	"Plant Biotechnology" online training programme on "Biodiversity Conservation" "Nursery development and vegetative propagation" online training programme on "Biodiversity Conservation"	01 day 05 days 01 day	to 06/01/2022 13/01/2022 17/01/2022- 21/01/2022 31/01/2022	Academicians and Students B.Sc and M.Sc Students of Danielson College, Chhindwara ICFRE Technical Staff. B.Sc and M.Sc Students of ATASH College of Management & Technology, Pandhurna District-Chhindwara	36 38	Excellent
(20)	"Plant Biotechnology" online training programme on "Biodiversity Conservation" "Nursery development and vegetative propagation" online training programme on "Biodiversity Conservation" Outreach training on "Avoid Use of	01 day	to 06/01/2022 13/01/2022 17/01/2022- 21/01/2022	Academicians and Students B.Sc and M.Sc Students of Danielson College, Chhindwara ICFRE Technical Staff. B.Sc and M.Sc Students of ATASH College of Management & Technology, Pandhurna District-Chhindwara Students of Std.8 th & 9 th	45	Excellent
(20) (21) (22)	"Plant Biotechnology" online training programme on "Biodiversity Conservation" "Nursery development and vegetative propagation" online training programme on "Biodiversity Conservation" Outreach training on "Avoid Use of Single Plastic & Medicinal plants"	01 day 05 days 01 day	to 06/01/2022 13/01/2022 17/01/2022- 21/01/2022 31/01/2022	Academicians and Students B.Sc and M.Sc Students of Danielson College, Chhindwara ICFRE Technical Staff. B.Sc and M.Sc Students of ATASH College of Management & Technology, Pandhurna District-Chhindwara Students of Std.8 th & 9 th class of Govt. Higher	36 38	Excellent
(20) (21) (22)	"Plant Biotechnology" online training programme on "Biodiversity Conservation" "Nursery development and vegetative propagation" online training programme on "Biodiversity Conservation" Outreach training on "Avoid Use of Single Plastic & Medicinal plants"	01 day 05 days 01 day	to 06/01/2022 13/01/2022 17/01/2022- 21/01/2022 31/01/2022	Academicians and Students B.Sc and M.Sc Students of Danielson College, Chhindwara ICFRE Technical Staff. B.Sc and M.Sc Students of ATASH College of Management & Technology, Pandhurna District-Chhindwara Students of Std.8 th & 9 th class of Govt. Higher	36 38	Excellent
(20) (21) (22)	"Plant Biotechnology" online training programme on "Biodiversity Conservation" "Nursery development and vegetative propagation" online training programme on "Biodiversity Conservation" Outreach training on "Avoid Use of Single Plastic & Medicinal plants" Use for Govt. Higher, Nonia	01 day 05 days 01 day	to 06/01/2022 13/01/2022 17/01/2022- 21/01/2022 31/01/2022	Academicians and Students B.Sc and M.Sc Students of Danielson College, Chhindwara ICFRE Technical Staff. B.Sc and M.Sc Students of ATASH College of Management & Technology, Pandhurna District-Chhindwara Students of Std.8 th & 9 th class of Govt. Higher Secondary School	36 38	Excellent
(20) (21) (22) (23)	"Plant Biotechnology" online training programme on "Biodiversity Conservation" "Nursery development and vegetative propagation" online training programme on "Biodiversity Conservation" Outreach training on "Avoid Use of Single Plastic & Medicinal plants" Use for Govt. Higher, Nonia Karbal, Chhindwara (MP) online refresher training program on Agroforestry and opportunities	01 day 05 days 01 day	to 06/01/2022 13/01/2022 17/01/2022 21/01/2022 31/01/2022 15/02/2022 17/02/2022	Academicians and Students B.Sc and M.Sc Students of Danielson College, Chhindwara ICFRE Technical Staff. B.Sc and M.Sc Students of ATASH College of Management & Technology, Pandhurna District-Chhindwara Students of Std.8 th & 9 th class of Govt. Higher Secondary School ,NoniaKarbal, Chhindwara	36 38 51	Excellent
(20) (21) (22) (23)	"Plant Biotechnology" online training programme on "Biodiversity Conservation" "Nursery development and vegetative propagation" online training programme on "Biodiversity Conservation" Outreach training on "Avoid Use of Single Plastic & Medicinal plants" Use for Govt. Higher, Nonia Karbal, Chhindwara (MP) online refresher training program on Agroforestry and opportunities in value addition for established	01 day 05 days 01 day	to 06/01/2022 13/01/2022 17/01/2022- 21/01/2022 31/01/2022 15/02/2022	Academicians and Students B.Sc and M.Sc Students of Danielson College, Chhindwara ICFRE Technical Staff. B.Sc and M.Sc Students of ATASH College of Management & Technology, Pandhurna District-Chhindwara Students of Std.8 th & 9 th class of Govt. Higher Secondary School ,NoniaKarbal, Chhindwara Agri-preneure	36 38 51	Excellent
(20) (21) (22) (23)	"Plant Biotechnology" online training programme on "Biodiversity Conservation" "Nursery development and vegetative propagation" online training programme on "Biodiversity Conservation" Outreach training on "Avoid Use of Single Plastic & Medicinal plants" Use for Govt. Higher, Nonia Karbal, Chhindwara (MP) online refresher training program on Agroforestry and opportunities in value addition for established agri-prenuers under AC & ABC	01 day 05 days 01 day	to 06/01/2022 13/01/2022 17/01/2022 21/01/2022 31/01/2022 15/02/2022 17/02/2022	Academicians and Students B.Sc and M.Sc Students of Danielson College, Chhindwara ICFRE Technical Staff. B.Sc and M.Sc Students of ATASH College of Management & Technology, Pandhurna District-Chhindwara Students of Std.8 th & 9 th class of Govt. Higher Secondary School ,NoniaKarbal, Chhindwara Agri-preneure	36 38 51	Excellent
(20) (21) (22) (23) (24)	"Plant Biotechnology" online training programme on "Biodiversity Conservation" "Nursery development and vegetative propagation" online training programme on "Biodiversity Conservation" Outreach training on "Avoid Use of Single Plastic & Medicinal plants" Use for Govt. Higher, Nonia Karbal, Chhindwara (MP) online refresher training program on Agroforestry and opportunities in value addition for established agri-prenuers under AC & ABC MANAGE, Jabalpur	01 day 05 days 01 day 1 day 2 days	to 06/01/2022 13/01/2022 17/01/2022- 21/01/2022 31/01/2022 15/02/2022 & 18/02/2022	Academicians and Students B.Sc and M.Sc Students of Danielson College, Chhindwara ICFRE Technical Staff. B.Sc and M.Sc Students of ATASH College of Management & Technology, Pandhurna District-Chhindwara Students of Std.8 th & 9 th class of Govt. Higher Secondary School ,NoniaKarbal, Chhindwara Agri-preneure And farmers	36 38 51	Excellent
(20) (21) (22) (23)	"Plant Biotechnology" online training programme on "Biodiversity Conservation" "Nursery development and vegetative propagation" online training programme on "Biodiversity Conservation" Outreach training on "Avoid Use of Single Plastic & Medicinal plants" Use for Govt. Higher,Nonia Karbal, Chhindwara (MP) online refresher training program on Agroforestry and opportunities in value addition for established agri-prenuers under AC & ABC MANAGE, Jabalpur One week training programme on	01 day 05 days 01 day	to 06/01/2022 13/01/2022 17/01/2022 31/01/2022 31/01/2022 15/02/2022 & 18/02/2022 & 21/02/22 to	Academicians and Students B.Sc and M.Sc Students of Danielson College, Chhindwara ICFRE Technical Staff. B.Sc and M.Sc Students of ATASH College of Management & Technology, Pandhurna District-Chhindwara Students of Std.8 th & 9 th class of Govt. Higher Secondary School ,NoniaKarbal, Chhindwara Agri-preneure	36 38 51	Excellent
(20) (21) (22) (23) (24)	"Plant Biotechnology" online training programme on "Biodiversity Conservation" "Nursery development and vegetative propagation" online training programme on "Biodiversity Conservation" Outreach training on "Avoid Use of Single Plastic & Medicinal plants" Use for Govt. Higher, Nonia Karbal, Chhindwara (MP) online refresher training program on Agroforestry and opportunities in value addition for established agri-prenuers under AC & ABC MANAGE, Jabalpur	01 day 05 days 01 day 1 day 2 days	to 06/01/2022 13/01/2022 17/01/2022- 21/01/2022 31/01/2022 15/02/2022 & 18/02/2022	Academicians and Students B.Sc and M.Sc Students of Danielson College, Chhindwara ICFRE Technical Staff. B.Sc and M.Sc Students of ATASH College of Management & Technology, Pandhurna District-Chhindwara Students of Std.8 th & 9 th class of Govt. Higher Secondary School ,NoniaKarbal, Chhindwara Agri-preneure And farmers	36 38 51	Excellent

(26)	Plant Biotechnology	5 days	8-12	Students	12	Useful
			March			exposure
			2022			To labor
						techniques
(27)	"Advance Training in Molecular	05	21/03/2022	Scientists ICFRE	21	Excellent
	Biology Techniques and Its	Days	to			
	Application"		25/03/2022			
(28)	"Bamboo: processing &	02 days	24/03/2022	Members of Foundation of	25	
	management"		&	MSME Cluster, New		
	-		25/03/2022	Delhi and Maharashtra		
	Total	74			1696	

5. Format for details of trainings organized - annexure-6 (HRD Trainings)

	Trainings organized							
SN	Topic	Duration and period		Participants		Overall feedback of		
		Days	Date	Category	Numbers	Participants		
1.	"Nursery development and vegetative propagation"	05 days	17/01/2022 to 21/01/2022	ICFRE Technical Staff.	36	Excellent		
2.	on "Advance Training in Molecular Biology Techniques and Its Application"	05 Days	21/03/2022 to 25/03/2022	Scientists ICFRE	21	Excellent		
	Total	10 days			57			

1. Format for details of participation in workshops etc. Annexure-7

	Workshops/seminars/s	symposi	a/meetings etc.			
SN	Topic	Durati	on and period	Participants from the institute		
		Days	Date	Category	Numbers	
1.	Dr. Nanita Berry, Scientist E & Head participated in meeting with NPC of Seed Ball technology under chairmanship of ADG(RP) on 5 th April, 2021	1	5/04/2021	ICFRE scientists and SFDs	12	
2.	International Symposium Global symposium on soil Biodiversity FAO, United Nations.	4	19/04/2021 to 22/04/2021	Scientists Researchers, Students across the Globe & farmers	700	
3.	RathodDigvijaysinhUmedsinh, Scientist — B, Participated in Tree mortality webinar series: "Tree mortality modelling- a tool for ecological inference and challenges for projecting forest dynamics" organized by International Tree Mortality Network an initiative of the IUFRO task force on tree mortality.	1	06/05/2021	Concern Stakeholders.	489	
4.	International Webinar soil Biodiversity and the stabilization of carbon in the soil.	1	07/05/2021	Scientists Researchers, Students across the Globe & farmers	650	
5.	Dr. Mohan C., Scientist-B Forest Protection Division attended 01 day National webinar on "Prospects & problem of Bee keeping in India" through video conferencing organized by College of Forestry, Ponnampet& UAHS, Shivamoga on 20 th May 2021.	1	20/05/2021	Faculty, Students, Bee keepers	145	
6.	Scientist and Technical Officers of TFRI and FRC-SD, Chhindwara attended 01 day National webinar on "Non-destructive harvesting, processing & marketing of NTFPs" through video conferencing organized by Forest Extension Division at TFRI on 21 th May 2021.	1	21/05/2021	Faculty, Students, stakeholders	70	
7.	Scientists, Technical Officers and staff of Attended World Environment Day – 2021 organised by ICFRE, Dehradun	1	05/06/2021	Scientist and staff	100	
8.	Shri. M. Rajkumar, Scientist-C, delivered a Keynote address during the celebration of World Environment Day on topic 'Ecosystem Restoration: Unveiling the past, present for a better future'.	1	05/06/2021	Faculty, students and researchers from Kerala Agricultural University.	133	
9.	Dr. Avinash Jain, Scientist-F, delivered lecture on "Ecological restoration of	1	05/06/2021	Engineers, Miners, Scientist and	100	

	degraded lands: Working with			Scholars	
	industries."	1	05/06/2021	E 1 1 1 1	112
10.	Shri AjinShekhar, Scientist – B,waskeynote speaker for Kerala	1	05/06/2021	Faculty, students and Researchers	113
	B,waskeynote speaker for Kerala Agricultural University, College of			Researchers	
	Agricultura Oliversity, College of Agriculture, Trivandrum on World				
	Environment Day.				
11.	Sh. A.J.K. Asaiya, Scientist-C, Forest	1	05/06/2021	Researchers,	110
'''	Protection Division attended one day	1	03/00/2021	Faculties, Students	110
	webinar on "Conserving and restoring			racantes, stadents	
	ecosystem" through video conferencing				
	hosted by Department of environmental				
	science, University of Kashmir, Srinagar.				
12.	Shri RathodDigvijaysinhUmedsinh	1	07/06/2021	Multi-level	100
	Scientist – B, Participated in "Food			Stakeholders	
	System Resilience through Integrated			(including	
	Natural Resource Management: A Food			governments,	
	Systems Summit Independent Dialogue",			academia etc.)	
	organized by FAO.				
13.	Dr. Avinash Jain, Scientist-F, delivered	2	09/06/2021	Forest Ranger	40
	lecture to Forest ranger Trainees of Tamil			Trainees	
	Nadu Forest Academy, Coimbatore on				
	Topic : An overview of TFRI.				
14.	Dr. Darshan, K., Scientist- B delivered	1	09/06/2021	Agricultural students	120
	virtual guest lecture on 'Multi-omics:			and faculties.	
	Approaches and its applications in Plant				
	Pathology' at VIT School of Agricultural Innovations and advanced learning				
	(VAIAL), Vellore, Tamil Nadu.				
15.	Dr.Nanita Berry, Scientist 'E' & Head	1	14/06/2021	SFD, SHG and	5
15.	attended meeting with representatives of	1	14/00/2021	Farmers	3
	Indo-German project on Agroforestry			1 armers	
	subject.				
16.	Dr. Mohan C., Scientist-B delivered	1	14/06/2021	U. G students of	120
10.	special lecture on Recent trends in Forest	-	1 1/00/2021	TNAU, Coimbatore.	120
	pest management.			Trans, comomore.	
17.	Dr. Mohan, C, Scientist-B delivered	1	17/06/2021	Students and	80
	lecture in webinar on 'World Day to			Research Scholars	
	Combat Desertification and Drought and				
	agro climatological model training				
	organized by All India Agricultural				
	Students Association, Tamil Nadu State				
	Environmental Cell.				
18.	Shri RathodDigvijaysinhUmedsinh	1	19/06/2021	U. G Students	48
	Scientist – B, delivered lecture (online)				
	on "Integrated Farming System -				
	Agroforestry", invited by the				
	PlanticaInstitute of Agricultural Studies				
10	in Dehradun.	1	10/06/2021	Dagaguahaga	125
19.	Sh. A.J.K. Asaiya, Scientist-C, Forest	1	19/06/2021	Researchers,	125

	Protection Division attended one day			Faculties, Students	
	national webinar on "Biodiversity assessment monitoring and				
	assessment monitoring and conservation"through video conferencing				
	organized by Dr. B.R.R. Govt. Degree				
	College, Mehboobnagar, Telangana held				
	on 19 th June 2021.				
20.	Shri Rathod Digvijaysinh Umedsinh	1	21/06/2021	Farmers, Research	130
20.	Scientist – B, participated in "National	1	21/00/2021	Scholar, Scientists,	130
	Workshop on Water Budgeting: An			other stakeholders	
	Approach for Sustainable Water			other stakeholders	
	Resources Management in Rajasthan",				
	organized by MaharanaPratap University				
	of Agriculture and Technology, Udaipur,				
	(Rajasthan).				
21.	Dr. Mohan C. Scientist- B Forest	01	02/07/2021	Researchers,	70
21.	Protection Division participated in one	01	02/07/2021	Faculties, Students	70
	day International webinar on "Desert			Tudanies, Students	
	locust Schistocereagregaria –				
	International scenario and a potential				
	threat to India" organized by NIPHM				
	Hyderabad, Telangana.				
22.	Smt. MamtaMeshram, Scientist-B of the	01	02/07/2021	Researchers,	25
	FRC-SD attended webinar on			Faculties, Students	
	"Conservation and Value Addition of				
	Fruits of Forest Origin" organized by				
	Forest Research Centre for Eco-				
	Rehabilitation, Prayagraj.				
23.	Dr. HariomSaxena, Scientist-D, delivered	01	07/07/2021	UG Students of	100
	a lecture on "Sustainable management of			Agriculture college,	
	economically important NTFPs of central			Indore.	
	India their conservation and sustainable				
	livelihood of dependent communities"	0.1	00/07/0001	D 1	0.50
24.	Shri RathodDigvijaysinhUmedsinh,	01	08/07/2021	Researches,	950
	Scientist–B, Participated in Drones for			Scientist, Students	
	restoration monitoring and planning			and other	
	organized by Open Forests and One Tree			stockholders	
25	Planted. Dr. Nanita Berry, Scientist 'E' delivered	01	12/07/2021	Forest Guards of	51
25.	Guest lecture on 'Silviculture of	O1	12/01/2021	Balaghat Rangers	J1
	important tree species and its plantation'			College, Balaghat	
	through virtual mode.			(MP)	
26.	Scientist and Technical Officers of TFRI,	01	16/07/2021	Researchers,	30
20.	Jabalpur and FRC-SD Chhindwara	01	10,07,2021	Faculties, Students	
	attended one day webinar on				
	"Development of <i>Moringa</i> leaf based				
	product" through video conferencing				
	hosted by FRC- Eco rehabilitation,				
	Prayagraj.				
27.	Sh. A.J.K. Asaiya, Scientist-C, Forest	01	16/07/2021	UG students of Dr	77

	Protection Division attended one day International Webinar on "Ecological importance of snake" organized by			BRR Govt. Degree college Mehaboob Nagar Telangana	
	Association for Biodiversity Conservation & Development.				
28.	All Scientist attended online meeting and discussed regarding submission oflong term project proposals in Forestry Research supported by NITI AYOG.	01	20/07/2021	TFRI Scientists	14
29.	Sh. A.J.K. Asaiya, Scientist-C, Forest Protection Division attended one day webinar on "Stories of Mushroom" through video conferencing hosted by Department of Botany, University of Delhi	01	20/07/2021	Researchers, Faculties, Students	55
30.	Dr. Mohan C. Scientist- B Forest Protection Division participated in one day webinar on "Bamboo" through video conferencing organized by Bamboo society of India, Bengaluru.	01	24/07/2021	Researchers, Faculties, Students	60
31.	Sh. A.J.K. Asaiya, Scientist-C, Forest Protection Division attended one day webinar on "Mangrove" through video conferencing hosted by Forest Research Center for Coastal Ecosystem Vishakhapattanam.	01	26/07/2021	Researchers, Faculties, Students	42
32.	Dr. Nanita Berry, Scientist 'E' attended Project Evaluation Committee meeting for the project entitled - Biodiversity of Satpura Agro-climate region with special reference to dependencies of Tribes.	1	5/08/2021	SFDs	5
33.	ShAjinShekhar, Scientist-B participated in International webinar on Restoration Ecology – jointly organized by WCB Research Foundation and, Centre For Nature and Ecosystem Well Being (CNEW) Vadodara, Gujrat.	01	08/08/2021	Researchers, Scientists and Scholars	87
34.	Scientists and Technical Officers of TFRI attended meeting with Dr. T.K. Dhamodharn, Chair of Excellence (Forest products), IWST-ICFRE: (Chair of Excellence –Prioritization of Forest Products Research, Training and HR Need Assessment hosted by IWST, Bengaluru	01	13/08/2021	Researchers, Scientists and Technical Staffs	40
35.	Dr. Fatima Shirin, Scientist 'G' delivered lecture in certificate course on bamboo based entrepreneurship opportunities, challenges and option for agriculture	01	17/08/2021	Agriculture Graduates Name of college/university	60

				1	
	graduates: An interaction with industries				
	and role models and administrations.				
	Rajmata Vijayaraje Sindhiya Agriculture				
	University, Gwalior, M.P.				
36.	Dr. HariomSaxena, Scientist-D delivered	01	20/08/2021	Agriculture	25
	invited lecture on "Value addition and			graduates.	
	processing of bamboo shoots" for				
	students of Rajmata Vijayaraje				
	Scindia Krishi Vishwavidyalaya, Gwalior				
	(M.P on the occasion of Certificate				
	course on bamboo based				
	entrepreneurship opportunities;				
	challenges and options for agriculture				
	graduates: An interaction with				
	Industrialists and Role Models and				
	administrators.				
37.	Scientists of TFRI and FRC-SD Centre	01	23/08/2021	Scientists	20
	attended the meeting under chairmanship				
	of DG, ICFRE for review of Concept				
	Notes submitted to NITI Aayog through				
	Video Conferencing on 23-08-2021				
38.	Sh. N.D. Khobragade, Scientist-D and	01	24/08/2021	Researchers,	37
	Smt. MamtaMeshram, Scientist-B from			Scientists and	
	FRC-SD attended webinar on "Genetics,			Scholars	
	Breeding and Biotechnological				
	Application in Trees of Agroforestry and				
	Short Rotation Forestry" organized by				
	Forest Research Institute, Dehradun.				
39.	Shri A.J.K. Asaiya, Scientist- C attended	02	23/08/	Students,	145
	02 days national webinar on "IPR &		2021&	Researchers,	
	PATENTING: Road map to make India		24/08/ 2021	Faculties	
	the next innovation Hub" organized by				
	AdarshMahavidyala, Dhamangaon,				
	Amravati University, Maharashtra				
40.	TFRI organised a meeting with the	01	25/08/2021	TFRI Scientists and	10
	Officials of IFFDC, Madhya Pradesh and			IFFDC Officers	
	Scientists of TFRI under the				
	Chairmanship of Dr. G. Rajeshwar Rao,				
	ARS, Director, TFRI, Dr. Nanita Berry,				
	Scientist 'E', Dr. S. Saravanan, Scientist				
	F', Shri Rathod Digvijaysinh Umedsinh,				
	Scientist B and Shri Neeraj Prajapati,				
	Scientist B The agenda of the meeting				
	was how best to have collaboration				
	between TFRI and IFFDC to improve				
	livelihoods of stakeholders.				
41.	Dr. Avinash Jain, Scienstist-F, Shri	01	27/08/2021	Scientists, Technical	108
	A.J.K. Asaiya, Scientist- C, Dr. Darshan			officers and	
	K., Scientist- B, Shri AjinShekhar,			Research scholars	
	Scientist-B and Shri Nahar Singh Mawai,				

	T				
	A.C.T.O. attended one day national				
	webinar on "Creation of Manmade Forest				
	for Environment Protection" organized				
	by IFGTB, Coimbatore (T.N.)				
42.	Director TFRI and Dr. Avinash Jain,	01	27/08/2021	Officers and	70
	Scientist- F and Head of FE&CC			Scientists	
	Division attended National stakeholders				
	consultation workshop on "Development				
	of roadmap for institutional and policy				
	mainstreaming of sustainable land and				
	ecosystem management (SLEM) in				
	India" held on 27-08-2021				
43.	Mr. Digvijay S. Thakur participated in	1	Sept. 2021		25
	webinar on "Increase in Forest				
	Productivity through Tree Improvement",				
	Organized by: TFRI Jabalpur				
44.	Shri A.J.K. Asaiya, Scientist- C attended	01	04/09/2021	Students,	225
	national webinar on "Jaivik/VedikKheti"			Researchers,	
	organized by The Eco-Factory			Faculties	
	Foundation Pune.				
45.	Shri A.J.K. Asaiya, Scientist- C attended	01	04/09/2021	Researchers,	148
	national webinar on "Catch The Rain"			Students, Faculties	
	organized by Government Degree				
	College, Koratla& Government Degree				
	College (W), Jagtial, Hyderabad.				
46.	Shri A.J.K. Asaiya, Scientist- C attended	01	08/09/2021	Students,	135
	national webinar on "Recent trends in			Researchers,	
	plant Bio-technology" organised by			Faculties	
	Department of Biotechnology Pingle				
	Govt. College For Women,				
	Warangal, Telangana.				
47.	Mr. Digvijay S. Thakur, Mr. Neeraj	1	13 sep,2021	Researchers,	250
	Prajapati participated in National			Scientists, TOs	
	Webinar on "What to look for:				
	Sustainable Ways to Protect the Forest				
	Health" organized by the Forest				
	Protection Division, Tropical Forest				
	Research Institute [TFRI] JABALPUR,				
	MP.	0.1	1.5/00/2021	G. 1	0.1
48.	Mr. M. Rajkumar, Scientist -D attended	01	15/09/2021	Students and	01
	Webinar on "Ethnobotanical studies and			Researchers	
	publication in a world of Nagoya				
	protocol and post SARS-COV-2"				
	organized by the Centre for Conservation				
	of Natural Resources (CCNR), The				
	University of Trans-Disciplinary Health				
40	Sciences & Technology, Bengaluru.	01	16/00/2021	Caiantiat a1	27
49.	Shri RathodDigvijaysinhUmedsinh,	01	16/09/2021	Scientist and	37
	Cointiet D nonticinated in1			Officers of TEDI	1
	Scientist – B , participated in webinar "Income Enhancement from			Officers of TFRI, Research Scholar,	

	T				
	Agroforestry" on 16th September, 2021,			Assistant Professor,	
	Organized by Forest Research Institute			Farmers,	
	Dehradun.			Industrialist	
50.	Mr. M. Rajkumar, Scientist -D attended	01	16/09/2021	Students, Teachers,	01
	Webinar on 'Celebration of World Ozone			IFS Officers, and	
	Day 2021' organized by MOEFCC, New			Researchers	
	Delhi			Researchers	
		0.2	20/00/2021		4 - 10
51.	Shri A.J.K. Asaiya, Scientist- C attended	03	20/09/2021	Students,	165
	International Virtual Conference on		to	Researchers,	
	"Advances in information and		22/09/2021	Faculties	
	communication technology" Organized				
	by Dept. of Agricultural Extension,				
	NABS & DSPT PURSE II, Faculty of				
	Agriculture, Annamalai University.				
52.	Mr. AjinSekhar, Scientist –B attended	1	22/09/2021	Scientists, Technical	30
32.	webinar organized by IFB Hyderabad on	1	22/07/2021	officers and project	30
				1 3	
	22.09.2021.		22/00/2021	fellows	20
53.	Dr. Avinash Jain, Scientist -F and Head	1	22/09/2021	Scientists, Technical	30
	delivered talk on "Management of fly-ash			officers and project	
	in thermal power plant and its application			fellows.	
	in forestry sector" in webinar organized				
	by IFB Hyderabad on 22.09.2021.				
54.	Mr. AjinSekhar, Scientist –B attended	1	23/09/2021		150
	webinar on "The status of grasslands in				
	India and the complex life of Banni" on				
	23.09.2021				
	organized by ICAR- Indian Grassland				
	and Fodder Research Institute, Jhansi				
	(UP) and Range Management Society of				
	India, Jhansi (UP).		27/00/2021		. ~
55.	Dr. VishakhaKumbhare, Scientist	1	25/09/2021	Students and	45
	Incharge/ Scientist-E of the centre			Researchers	
	attended Series 13 webinar on				
	"Innovative Technology for Propagation	1			
	and Cultivation of Bamboo" organized by				
	Bamboo Society of India on 25.09.2021				
	through online mode.	1			
56.	Dr. Mohan C., Scientist- B participated in	05	27/09/2021	Scientists	28
50.	five days online training programme on		to		
	"Forest certification" through virtual	1	01/10/2021		
		1	01/10/2021		
	mode organized by Division of				
	Silviculture& Forest Management, FRI,	1			
	Dehradun held on 27.09.2021 to01.10. 21	ļ	20.00.2021		0.7
57.	Mr. Digvijay S. Thakur participated in	2	28.09.2021		35
	IUFRO World Day: Digital Forest	1	to		
	Science Forum 2021Attending the event		29.09.2021		
	"Role of ICFRE in India Forestry" talk				
	delivered by DG ICFRE and other				
	events, dated on 28 & 29 Sept. 2021				
58.		3	29/09/21 to	Scientist across ICAF	500
	J J F F	L	, -		

	International Webinar Conference on "Alternate Cropping Systems for Climate Change and Resource Conservation" from 29th September – 1st October 2021 organized by ICAR-IIFSR		01/10/21	other institutions	
59.	Mr. M. Rajkumar, Scientist – D attended "Launch of MoEFCC's Iconic week of Azadi Ka Amrut Mahotsav and wild life week celebrations" organized by MoEFCC, New Delhi on 2nd October, 2021	01	02/10/2021	Scientists, students and general public	190
60.	All Scientists attended Launch on "Elimination of single use plastics" organized by MoEFCC, New Delhi on 4th October, 2021	01	04/10/2021	Scientists and school students	150
61.	Shri A.J.K. Asaiya, Scientist- C attended a talk on "Awareness programme to avoid single use plastic" organized by T.F.R.I., Jabalpur under MOEFCC Iconic week celebration held on 04th October 2021.	01	04/10/2021	Scientist, Researchers, Students	32
62.	Mr. Manish K Vijay participated in the FRI ICONIC Week Talk-01 on "Policies and Procedure for handling single-use plastics at consumer level"	1	04/10/2021	Scientists of TFRI and other ICFRE institutes	35
63.	Mr. Digvijay S. Thakur attended the meeting with Director, Achanakmar Amarkantak Biosphere Reserved (AABR) under the headship of Director TFRI at TFRI on providing research support and landscape level management plan for conservation of flora and fauna of AABR.	1	4.10.2021		25
64.	Dr. Mohan C., Scientist- B participated in two days National webinar on "Nano size–Big impact: Nano revolution for transforming Agriculture, Food, Nutrition & Health" through virtual mode organized by Rani Lakshmi Bai Central Agri. University, Jhansi & collaboration with IGFRI (ICAR), Jhansi held on 04.10.2021 to 05.10. 2021	02	04/10/2021 to 05/10/2021	Researchers, Faculties, Students	215
65.	Mr. Manish K Vijay participated in the ICAR lecture series #30 on "Future Proofing the Drylands" by Dr. Jacqueline Hughes, DG ICRISAT on	1	05/10/2021	Scientist across ICAR and other institutions	85
66.	Mr. Manish K Vijay participated in the Webinar on "Forest genetic resources and their importance" organized by IFGTB, Coimbatore on	1	06/10/2021	Scientists across ICFRE institutes	40

67.	Shri A.J.K. Asaiya, Scientist- C attended	01	08/10/2021	Students,	48
07.	one day webinar on "Biotechnological	01	00/10/2021	Researchers,	10
	approaches in forest insect pest and			Faculties	
	disease management" organised by FRI			1 acuities	
	Deharadun held on 08th October 2021				
60	Dr. Mohan C., Scientist- B attended	01	11/10/2021	Scientists	45
68.	I -	01	11/10/2021	Scientists	43
	online training programme in hindi on "Sandal Farming & Management of its				
	Health" organized by IWST, Bengaluru				
	held on 11th October 2021				
	Mr. Manish K Vijay participated in the	1	12/10/2021	Scientist across	156
69.	ICAR lecture series #31 on "Science,	1	12/10/2021	ICAR and other	130
	· · · · · · · · · · · · · · · · · · ·			institutions	
				Institutions	
	Transforming Agriculture in India" by				
	Prof. R.B.Singh, Former President				
	NAAS on	2	17 10/10/	Calcutin	502
70.	Dr. Nanita Berry, Scientist - E presented poster (Virtual Mode) in 3rd	2	17-18/10/	Scientist,	523
	poster (Virtual Mode) in 3rd International Conference Global Initative		2021	Researchers and	
				Students	
	in Agriculture, Forestry and Applied				
	Science (Theme - Food security,				
	Environment safety and Sustainable				
	Development (GIAFAS-2021) held at Shri Guere Ram Rai University,				
	Dehradun, Uttaralhand, India	1	1.6/10/2021	0-1	450
71.	Mr. Manish K Vijay participated in the	1	16/10/2021	Scientist across the world	450
	"An Evening with World Food Laureates Discussion on Global Food and Nutrition			world	
	Security to meet the SDGs during and after Covid 19 Pandemic" (Virtual mode)				
72	Mr. Manish K Vijay participated in the	5	25/10/21 to	Researcher and	25
72.	Seed Science and Technology webinar	3	29/10/21 to	academicians around	23
	series, by IOWA State University, the		29/10/21	the world	
	1 · · · · · · · · · · · · · · · · · · ·			the world	
	USA addressing current topics in seed science and technology-led by seed				
	industry leaders and educators.				
73.	Dr. Jangam Deepika attended webinar on	01	09/11/2021	Scientist and	500
/ 3.	"Salinity and climate smart agriculture:	01	09/11/2021	Research Scholars	500
	Understand, connect and act now"			Research Scholars	
	organised by FAO				
74.	Dr. Vishakha Kumbhare, Scientist	02	09/11/2021	Scientist and	27
/4.	Incharge / Scientist-E, attended ICFRE-	02	&	Research Scholars	21
	IUFRO Workshop on Forest Landscape		10/11/2021	Research Scholars	
	Restoration (FLR) through on-line mode		10/11/2021		
	on 9.11.2021 and 11.11.2021				
75.	Dr. Pramod Kumar Scientist-C and Shri	02	10/11/2021	Scientist,	32
13.	KaushalTripathi, Scientist-B participated	02	&11/11/2021 &11/11/202	Academicians,	52
	and presented research paper in National		1	Students	
	conference on Clonal Forestry in Eco—		1	Students	
	restoration (NCCFER-2021) organised at				
1	1 restoration (14001 LR-2021) organiscu at			ĺ	

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	Forest Research Centre for Eco-				
	rehabilitation, Prayagraj (UP)	0.1		~	
76.	Shri Manish Kumar Vijay, Scientist-B	01	12/11/2021	Scientist across	35
	attended Webinar on "Urban Forestry"			ICFRE and other	
	by IFGTB,Coimbatore		17/1/2001	institutions	
77.	Shri AviralAsaiya, Scientist C and Dr.	01	17/11/2021	FDCM	40
	Darshan K, Scientist-B participated one				
	day workshop on FDCM and delivered				
	lecture on Biofertilizers and Organic				
	fertilizers organized by MADHYA				
	PRADESH VAN VIKAS NIGAM, LTD.				
	at Bhopal on 17.11.2021	0.1		~	
78.	Shri Manish Kumar Vijay, Scientist-B	01	20/11/2021	Scientist across	205
	attended webinar on "Integration of			ICAR and other	
	medicinal and aromatic plants in different			institutions	
	cropping system"organizedbyICAR-				
	DCR.				
79.	Mr. M. Rajkumar, Scientist-D, Mr.	01	20/11/2021	Scientists, students	159
	AjinSekhar and Dr.Jangam Deepika,			and general public	
	Scientist-B participated closing ceremony				
	of "Awareness Campaign On Single Use				
	Plastic - 2021" organized by MOEFCC				
	on 20-11-2021.	0.0	20/11/2021		4.70
80.	Shri Rathod Digvijaysinh Umedsinh	02	20/11/2021	Scientists, Faculties,	150
	Scientist – B,participated in 4 th PSRM-		&21/11/202	Professors, Students,	
	2021: National Conference on Advance		1	Research Scholars	
	in Plant Sciences Research, Organized by			and other	
	APSR, Dehradun and SOAAS, H.N.B			stockholders	
	Garhwal University (A central				
	University), Srinagar, dated on 20-21				
	November, 2021.	0.1	22/11/2021	G :	0.4
81.	Mr. M. Rajkumar participated in webinar	01	23/11/2021	Scientist,	04
	"Sensitization cum review workshop on			Students and general	
	National clean air programme" organised			public	
	by MoEFCC.	01	26/11/2021	Caiantists	65
82.	Shri A.J.K. Asaiya, Sci- C attended one	01	26/11/2021	Scientists,	65
	day webinar on "Potential and prospects of value addition in Wild edibles"			Researchers	
	organised by FRI Dehardun on 26.11.2021.				
02	Shri Manish K. Vijay,SciB attended	01	29/11/2021	Scientists,	45
83.	8 th edition of <i>Dr. S. Kedharnath</i>	01	27/11/2U21	Researchers	43
	Memorial Lecture (KML – 2021).			Researchers	
84.	Dr. Avinash Jain, Mr. M. Rajkumar and			Both the signatories'	
04.	Mr. Dheeraj Gupta participated in MoU			institutes	
	meeting between TFRI, Jabalpur and			moututes	
	Rajmata Vijayaraje Sindhiya Krishi	01	07/12/2021		20
	Vishwa Vidyalaya, Gwalior on 07-12-				
	2021.				
85.	Shri Rathod Digvijaysinh Umedsinh,	01	08/12/2021	Scientists and	50
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	Scientist – B, Dr.Jangam Deepika attended Webinar on "Climate Smart Forestry: An Instrument For Mitigating Climate Change" jointly organized by FRI, Dehradun and British deputy high commission, Chandigarh on 8-12-2021.			research scholars	
86.	Dr. Jangam Deepika attended webinar on "Salinity and climate smart agriculture: Understand, connect and act now" organized by FAO	01	09/12/2021	SFDs	500
87.	Dr.Avinash Jain, Mr. M. Rajkumar and Mr. Dheeraj Gupta participated in MoU meeting between TFRI Jabalpur and Rani Lakshmi Bai university, Jhansi on 09-12-2021	01	09/12/2021	Both the signatories' institutes	100
88.	Dr. Avinash Jain, Mr. M. Rajkumar and Mr. Dheeraj Gupta participated in MoU meeting between TFRI Jabalpur and ICAR-CAFRI, Jhansi on 09-12-2021	01	09/12/2021	Both the signatories' institutes	7
89.	Dr. Avinash Jain, Mr. M. Rajkumar and Mr. Dheeraj Gupta participated in MoU meeting between TFRI Jabalpur and ICAR-Indian Grassland and Fodder Research Institute, Jhansi on 09-12-2021	01	09/12/2021	Both the signatories' institutes	6
90.	Dr.Avinash Jain, Mr. M. Rajkumar and Mr. Dheeraj Gupta participated in MoU meeting between TFRI Jabalpur and IISC, Jhansi on 09-12-2021	01	09/12/2021	Both the signatories' institutes	6
91.	Dr. Avinash Jain, Mr. M. Rajkumar and Mr. Dheeraj Gupta participated in MoU meeting between TFRI Jabalpur and Banda University of Agriculture and Technology, Banda on 10-12-2021	01	10/12/2021	Both the signatories' institutes	6
92.	Dr. Jangam Deepika attended Webinar on "Nursery techniques, cultivation and management of sandalwood" Under "Azadika Amrit Mahotsav" on 10-12-2021 organized by Institute of Wood Science And Technology, Bengaluru	1	10/12/2021	Scientists, technical officers and research scholars	60
93.	Dr. Mohan C, Participated webinar on (10 th Dec, 2021) "Nursery techniques, cultivation and management of sandal wood" organized by IWST, Bangalore.	01	10/12/2021	Research scholars, scientists and stake holders.	25
94.	All scientists participated Online Regional Research Conference (RRC) on "Vocal for Local: Sustainable Development of Non-Timber Forest Products for livelihood generation" on 13-14 December, 2021organized by TFRI, Jabalpur.	2	13/12/2021 to 14/12/2021	Scientists, technical officers and research scholars	120

95.	Dr. M. Kundu, Dr. Nanita Berry, Dr. S. C. Biswas, Dr. Hariom Saxena, Shri Rathod Digvijaysinh Umedsinh, & Sh. Neeraj Prajapati, attended Regional Research Conference (RRC) held from 13 th -14 th Dec., 2021at TFRI.	2	13/12/2021 & 14/12/2021	Scientists, Forest officials, Technical staff, Research Scholars of ICFRE and other stakeholders	100
96.	Mr. A.J.K Asaiya (Sci -C) delivered a lecture on "Role of Bio-fertilizers in stress sites"throughpowerpoint presentation on Two days training on "Climate Change Carbon Sequestration Increasing Green Cover and Utilization of Fly Ash" for the officers of Adani power Maharashtra ltd organised by TFRI on 15-16 December 2021.	02	15/12/2021 & 16/12/2021	Officers of Adani power Maharashtra	35
97.	Dr. Nanita Berry, Scientist 'E', Mr. Ajin Sekhar and Dr.Jangam Deepika, Scientist-B attended National Conference on "Value addition and marketing of NTFPs" under "AzadikaAmritMahotsav"	1	16/12/2021	Scientists, technical officers and research scholars	80
98.	Dr. M. Kundu, Scientist-F, Dr. N. Berry, Scientist-E, Shri NeerajPrajapati Scientist- B attended the inaugural session of "01 day 'Workshop on National Conference on Value addition and Marketing of NTFPs' dated 16 th December, 2021 organised by TFRI Jabalpur	1	16/12/2021	Scientists, Technical staff and Research Scholars of ICFRE	29
99.	Dr. Mohan C (Sci- B) and Mr. A.J.K Asaiya,attended ICFRE organised Training programme on "Forest Policy Laws and Environmental Laws" from 13- 17 December 2021.	05	13/12/2021 & 17/12/2021	Scientists, Researchers	28
	Dr.JangamDeepika, Scientist-B attended Online training program on "Propagation of Forestry species" on 21-12-2021 organized by TFRI, Jabalpur.	01	21/12/2021	State Forest department, Scientists and technical officers	70
100.	Mr. M. Rajkumar participated in webinar – "Sensitization Cum Review Workshop on National Clean Air Programme" organized by MOEFCC	01	23/12/2021	Field functionary	04
101.	Mr. A.J.K Asaiya (Sci -C) delivered introductory lectures on Forest Pathology to visiting students of Manglayatan University on 27 December 2021.	01	27/12/2021	Students/Researcher s	90
102.	Mr. M. Rajkumar, Scientist-D, Mr. AjinSekhar and Dr. JangamDeepika, Scientist-B participated in "South Asian Consultation on Post-2020 Global Biodiversity Framework" organized by	.5	06/01/2022 &07/01/202 2	Scientists, students and general public	300

	MOEFCC on 6-7 January, 2022.				
103.	Mr. M. Rajkumar, Scientist-D and Mr. Ajin Sekhar, Scientist-B attended Launch of Indian State of Forest Report 2021 organized by MOEFCC – virtual mode	.5	13/01/2022	Scientists, students and general public	250
104.	on 13-01-2022. Scientists of TFRI attended the meeting on Signing of MoU between TFRI, Jabalpur and MANAGE, Hyderabad	1	16/1/2022	25	25
105.	Dr. Pramod Kumar, Scientist "D", delivered a lecture on "Vegetative propagation of important trees and bamboo and Clonal Seed Orchards." In HRD training module on "Nursery Development and Vegetative propagation"	01	17/01/2022	Scientists, Foresters, Academicians and Students	25
106.	Dr. JangamDeepika, Scientist-B attended Webinar on "Economics of Soil Health: Contributions of Reduced Tillage and Cover Cropping" organized by Soil Science Society of America.	01	18/01/2022	Scientists, and research scholars	50
107.	Mr. AjinSekhar, Scientist-B attended workshop on "Consortium on Industrial Agro-forestry – A value chain approach under ICAR – NAHEP- CAAST project" organized by Punjab State Forest Research Institute, Ludhiana.	01	20/01/2022	Faculty, Students, Industries and researchers	85
108.	Dr. JangamDeepika, Scientist-B attended Webinar on "Role of Cation Exchange in Nutrient Management" jointly organized by American Society of Agronomy and Soil Science Society of America.	01	25/01/2022	Scientists, Scholars and researchers	70
109.	Scientists of FE&CC division participated in online meeting on "Plantation - Audit & sequestration capacity assessment" with Reliance/ Birla Officers on 28-01-2022	01	28/01/2022	Reliance/ Birla Officers	25
110.	Dr. Avinash Jain, Mr. Raj Kumar and Mr. Ajin Sekhar participated in "National Level Dissemination and Demonstration Workshop on SLEM Knowledge Sharing and Reporting System" organized by ICFRE – Centre of Excellence.	01	01/02/2022	Scientists	13
111.	Shri. Aviral Asaiya, Scientist C attended webinar on "IPR: patent and Design Filling" organized by Seth Kesariwalporwal college in collaboration with Rajiv Gandhi National Institute of Intellectual Property Management, Govt. of India Nagpur.	1	01/02/2022	Researcher	25

112.	Mr. Raj Kumar, Mr. Ajin Sekharand Dr. J. Deepika participated in "National Level Celebration of World Wetlands Day" organized by MOEFF&CC.	01	02/02/2022	Scientists, Research Scholars, Students and general public	650
113.	Dr. H. O. Saxenaparticipated in 2nd International Conference on Recent Advances in Biotechnology &Nanobiotechnology (Int-BIONANO-2022) held at at Amity University, Gwalior.	01	10/02/22 to 11/02/22	-	50
114.	Mr. Manish K Vijay participated in the Attended national webinar on "Floristic Research in India" organized by BSI (MoEF&CC)	2	13-14 Feb, 2022	Researchers	15
115.	Mr. Manish K Vijay participated in the Attended inaugural session of collaborative refresher training programme on "Agroforestry and Opportunities in Value Addition" on	1	15-17 th feb 2022	Scientist, Technical staff	30
116.	Shri Manish Sharma Scientist- B, Attended inaugural session of collaborative refresher training programme on "Agroforestry and Opportunities in Value Addition".	3	15/02/2022 to 17/02/2022	Scientist, Technical staff	25
117.	Mr. Raj Kumar, Scientist- D delivered talk on "Biodiversity Conservation Potential of Agroforestry Systems" in online Refresher Training Programme jointly organized by TFRI and MANAGE, Hyderabad.	01	17/02/2022	Farmers, Research Scholars and Agri Entrepreneurs	35
118.	Dr. H. O. Saxenaattended International Conference on Sustainability & Environmental Perseverance in the Era of Covid 19" at Amity University, Gwalior.	1	17/02/2022	-	50
119.	Shri AviralAsaiya, Scientist- C, attended one day webinar on Development in hydrology science: Challenges and Opportunities organised by Forest Research Institute, Dehradun.	1	18/02/2022	Researcher	42
120.	Kundu, M., Saxena HO, Tiwari,S., Kahar, L., Gupta, D.K. and Chouhan, S. K. participated in National Symposium-Cum Workshop on "Biodiversity and Its Utilization and Conservation in Central India" held (In Blended Mode) at GGV, Bilaspur.	2	21/02/2022 to 22/02/2022	Scientists and Research Scholars	100
121.	Mr. Raj Kumar participated in "India- Japan Webinar on Biodiversity Conservation and Sustainable Development" organized by MOEFF&CC.	01	24/02/2022	Scientists, and Research Scholars	30

	Manial Kanasa Wii Ciriri	2	02/02/2022	0.:	<i>c</i> 0
122.	Manish Kumar Vijay, Scientist – B	2	02/03/2022	Scientist & Scholars	60
	attended National webinar on "Nurturing		to		
	the Neem (Azadirachta indica) for		03/03/2022		
	Nature and Livelihood Security"				
	organized by Rani Lakshmi Bai Central				
	Agricultural University, Jhansi				
123.	All scientists of TFRI participated in the	1		SFD and Farmers	
	meeting under chairmanship of		04/03/2022		25
	PCCF,MP, APCCF to discuss new				
	project proposal on submitted to MPSFD.				
124.	Manish Kumar Vijay, Scientist – B	1		Scientists	25
124.	Meeting with PC, KVK Mandla and	1	04/03/2022	Belefitists	23
			04/03/2022		
	different mangers for preparation of				
	KisanMela.		05/02/2555		00
125.	Manish Kumar Vijay, Scientist – B	1	05/03/2022	Scientist & Scholars	80
	attended webinar on "Macropropagation				
	of commercially important Bamboo				
	species" by Bamboo Society of India				
126.	Director, all Head of Divisions and	1		State Forest	120
	Scientist of TFRI attended "Release of		14/03/2022	Officers, Scientists	
	DPR of 13 major rivers of India prepared			and Academicians	
	by ICFRE, Dehradun"				
127.	Dr. Nanita Berry, Scientist 'F'	1			
	participated in the meeting with CEO,	-	14/03/2022	SFDs, and farmer	5
	SMPB, Chhattisgarh to discuss new		11,00,2022	22 25, and minor	
	project proposal on Agroforestry				
128.	Mr. AjinSekhar attended "World Forest	1	22/03/2022	Scientists,	100
120.	Day celebrations" organized by Kerala	1	22/03/2022	Researchers and	100
	Forest Research Institute	1		Scholars	1.5
129.	Attended meeting with under the	1	25/02/2022	Scientists	15
	Chairmanship of the Director sir TFRI to		25/03/2022		
	discuss different issue related to duties of				
	observers, deputed for Group C & D				
	exam.				
130.	Dr. H. O. Saxena participated in online	2	25-26 th	>100	110
	International conference on "Technology,		March, 2022		
	Innovation and Management for				
	Sustainable Development (TIMS-2022)"				
	held at ITM University Gwalior				
131.	Dr. Avinash Jain attended and delivered	1	28/03/2022	Scientists,	50
.51.	lecture on "Carbon Sequestration and	•	20,00,2022	Researchers,	
	atmospheric pollution" in National e-			Professors and	
	conference on "Sustainable Development			Students	
	of Environmental Protection			Students	
	Technology" organized by ISBM				
	university, Gariyabad, (C.G.)	1.67			1.4270
	Total	167			14378

Category = Scientists, TOs, Forest Officers, etc.

List of Training attended by the official of TFRI:

1	Mr. Manish K Vijay Received a five days training on "Forest Certification" for Scientists of ICFRE w.e.f. at FRI, Dehradun in online mode.	5	27/09/2021 to 01/10/2021	Scientists across ICFRE institutes	1
2	Mr. Manish K Vijay Received a "Training on Instrumentation" by TFRI in Virtual mode	3	27/10/21 to 29/10/2021	Scientists and other interested candidates across ICFRE or other institutes	1
3	Mr. Manish K Vijay participated in the Online training on "Sandalwood cultivation" by IWST, Bengaluru	1	10/12/2021	Open for all interested	1
4	Mr. Manish K Vijay participated in the Online training on "Propagation of Forestry Species" by the Genetics and Tree Improvement Division, TFRI	1	21/12/2021	For SFDs and other stakeholders	1
5	Mr. Manish K Vijay participated in the Attended Induction Training (Phase-II) for the newly recruited scientist of ICFRE	74	13/12/21 to 25/02/2022	Newly recruited scientist of ICFRE.	1
6	Mr. Manish K Vijay Attended two days of online training for scientists and researchers working in the forest and wildlife sector on "Linkage between Field Forest Managers and R&D Personnel" by CASFOS Dehradun, MoEF&CC	2	29th and 30th December 2021	scientists and researchers working in forest and wildlife sector	1
7	Mr. Manish K Vijay Attended training on "Biodiversity assessment, conservation and development" for the Scientists of Indian Council of Forestry Research and Education, Dehradun, India from by WII	5	21st to 25th February 2022	Scientists of ICFRE	1
8	Mr. Manish K Vijay Attended training on "Bioinformatics	5	28th Feb to 04th March	scientist of ICFRE	1

	1 44' 1 D' 1 22		2022	I	I
	and computational Biology"		2022		
	for the Scientists of Indian				
	Council of Forestry Research				
	and Education, Dehradun,				
	India by IFGTB, Coimbatore				
9	Mr. Manish K Vijay Attended	5	21st to 25th	scientist of	1
	training on "Advance training		March 2022	ICFRE	
	on molecular biology				
	techniques" for the Scientists				
	of Indian Council of Forestry				
	Research and Education,				
	, ·				
	Dehradun, India by TFRI,				
10	Jabalpur	10	02.05.2021		1
. 10	Mr. Digvijay S. Thakur	12	03.05.2021		1
	participated in Virtual		To		
	Induction Training on Project		14.05.2021		
	Management & Research				
	Methodology organized by				
	ICAR-NAARM, Hyderabad				
. 11	Mr. Digvijay S. Thakur	5	20.9.2021 to		1
	participated in Refresher		24.9.2021		
	training in Statistical methods				
	in forestry research" for				
	Scientist of ICFRE, Dehradun,				
	Organized by Statistical				
	Division, ICFRE Dehradun,				
	Dated on				
. 12		1	22.11.21		1
. 12	Mr. Digvijay S. Thakur	1	22.11.21		1
	participated in Training				
	program on Office				
	correspondence and file				
	management" Organized by				
	ICFRE, dated on				
. 13	Mr. Digvijay S. Thakur	5	21.02.2022 to		1
	participated in Training on		25.02.2022		
	Biodiversity assessment,				
	conservation and development"				
	conducted by WII				
. 14	Mr. Digvijay S. Thakur	10	22.02.2022		1
'	participated in hort course on		To		
	"Recent Developments in		3.03. 2022		
	Agroforestry Dimension for		3.03. 2022		
	Managing Salt Affected				
	Ecologies" dated on 22nd Feb.				
	-3rd March 2022 organized by				
	ICAR-CSSRI Karnal Haryana				

•	Mr. Digvijay S. Thakur participated in Induction training for Scientist of ICFRE	102	15.03.2021 to 25.06.2021		1
. 15	Sh. A.J.K. Asaiya attended Trg. on "Identification and Characterization of micro- organism" to be held at Agharkar Research Institute, Pune	5	7-11 March 22		1
. 16	Mrs. Mamta Meshram, Sci-C attended trg. on "Application of bio-char and nano fertilizer for quality planting stock, organized by CARI, Jhansi.	5	7-11 March 22		1
. 17	Dr. S N Mishra, Sci-C attended trg. on "Application of biochar and nano fertilizer for quality planting stock" organized by CARI, Jhansi.	5	7-11 March 22		1
. 18	Dr. Mohan C, Sci-B, attended Induction training for Newly Recruited Scientists	90	15 th march to 25 th June 2021	Scientists	01
. 19	Dr. Mohan C, Sci-B, attended Prospects and Problems of Bee keeping in India	01	20 th May 2021	Scientists	01
. 20	Dr. Darshan K, Sci-B, attended 5-days online training on 'Production Protocol for Entomopathogenic Nematodes' organized by National Institute of Plant Health Management, Hyderabad	5	22 -26 th Feb 2021	Scientists	01
. 21	Dr. Mohan C, Sci-B, attended International webinar on Desert Locust <i>Scistocera gregaria</i> - International scenario and a potential threat to India	01	2 nd July 2021.	Scientists	01
. 22	Dr. Mohan C, Sci-B, Participated in five days training program on "Remote sensing	05	August 02-06 , 2021	Scientists	02

	and GIS for ICFRE Scientists"				
. 23	Dr. Mohan C, Sci-B, participated one-week training program on statistical methods in forestry research for scientists of ICFRE	05	20- 25 th Sep, 2022	Scientists	02
. 24	Dr. Darshan K, Sci-B, participated in ICAR-Niche Area of Excellence funded virtual training course on "Bioprospecting of Natural Resources for the Production of Biopesticides" organized during held at Division of Agricultural Chemicals, ICAR- Indian Agricultural Research Institute, New Delhi.	05	March 15-19, 2021	Scientists	01
. 25	Dr. Mohan C, Sci-B, participated in five days training program on "Forest certification"	05	Sep 27 th to 2 nd Oct , 2021	Scientists	01
. 26	Dr. Mohan C, Sci-B, participated in National webinar on"Nano size- Big impact: Nano revolution for Transforming agriculture, food nutrition and Health"	02	October 4-5, 2021	Scientists	01
. 27	Dr. Mohan C, Sci-B, participated in Training program on Forest Policy, Laws and environmental Law	05	13-17 th Dec, 2021	Scientists	01
. 28	Dr. Mohan C, and Dr. Darshan, Sci-B, participated in Training for the ICFRE Scientists on "Wood Seasoning, Preservation and Composite wood"	05	07 th - 11 th March, 2022	Scientists	02
. 29	Dr. Mohan C, Sci-B, participated in Training program for Scientists on "Advance	05	21 st - 25 th March, 2022	Scientists	01

	training in molecular				
	biology techniques and its				
	application"				
. 30	Dr. Mohan C, Sci-B, attended	21	Feb 10 th	Scientists	01
	ICAR sponsored 21		to		
	days winter school on		2 nd March,		
	"Commercial Apiculture for		2022		
	livelihood security of farmer				
	and unemployed				
	rural youth"				
. 31	Dr. Darshan K, Sci-B, attended	90	15 th	Scientists	01
	Induction training for		Dec		
	Newly Recruited Scientists		to 25 th Feb		
			2022		
		148			35

SN	Topic	Duration Period	and	Participants		Overall feed of Participants
		Days	Date	Category	Numbers	
1	Celebrating 75 th year of Indian Independence, "Bharat KaAmritMahotsava', a webinar on "Non- destructive harvesting, processing and marketing of NTFPs" wasorganized at Tropical Forest Research Institute, Jabalpur (MP)	1 day	21/05/2021	Scientists, Technical Officers and Staff, Research Scholar and Farmers	70	
2	TFRI organized a webinar entitled – "We're part of solution # for nature' on the occasion of International Day of Biodiversity, 2021	1.5 hrs.	22/05/2021	Research Scholars, Technical Officers & Scientists	45	

4	A 1	01 1	1.6/07/2021	C -: : - 1	10	
4	Advances in Teak	01 day	16/07/2021	Scientists and	10	
	Cultivation: Genetic			Researchers		
	resources and					
	technologies"					
	Hosted by IFGTB,					
	Coimbatore Co-					
	Hosted by TFRI,					
	_					
	Jabalpur.	2.1	0.4/0.0/2.02.1		25.6	
6	TFRI organised a	2 hours	04/08/2021	Scientists and	256	
	webinar on			Technical Personnel		
	"Biodiversity and					
	Ecosystem					
	Restoration" as a					
	part of Bharat					
	KaAmrutMahotsav					
<u> </u>	celebrations 2021.	01.1	25/00/2021	TENT C :	-62	
7	TFRI organised a	01 day	25/08/2021	TFRI Scientists and	63	
	meeting with the			IFFDC Officers		
	Officials of IFFDC,					
	Madhya Pradesh					
	and Scientists of					
	TFRI under the					
	Chairmanship of Dr.					
	G. Rajeshwar Rao,					
	ARS, Director,					
	TFRI The agenda of					
	the meeting was					
	how best to have					
	collaboration					
	between TFRI and					
	IFFDC to improve					
	livelihoods of					
	stakeholders.					
0		1 .1	00/00/2021	Caiamtista Ct 1	10	
8	TFRI organised a	1 day	09/09/2021	Scientists, Students,	10	
	webinar on			Technical officers		
	"Increase in Forest			and Research		
	Productivity through			scholars		
	Tree Improvement"					
	during the					
	observation of					
	'Bharat					
	KaAmiritMahotsav'					
	under the theme					
	"Increase in Forest					
	Productivity through					
	Tree Improvement"					
	from 6-12					
	September 2021".					
9	The National	01 day	13/09/2021	Scientists, Students,	35	
	Webinar on "What	J		Technical officers	-	
	commis on white	•		2 0011111041 01110015]	l

10	to look for: Sustainable Ways to protect the Forest Health", organized by Forest Protection Division, Tropical Forest Research Institute, Jabalpur (MP) held on 13th September 2021.		07/01/2022	and Research scholars		
10	A Institute level monthly seminar (Webinar) organised on 'Zero Budget Natural Farming"	1 hour	07/01/2022	Scientist, Technical Officers, Research scholars and JRF	42	
11	FE&CC division organized online meeting on "Plantation - Audit & sequestration capacity assessment" with Reliance/ Birla Officers on 28-01-2022	1 Hour	28/01/2022	Reliance/ Birla Officers	25	
	Total	10			581	

1. Format for detailsof Awareness/ Demonstration programmes organized- Annexure -9

	Awareness/ Demonstration programmesorganized					
SN Topic		Duration	ation and period Participants			Overall feedback c Participants
		Days	Date	Category	Numbers	
1.	Dr. S. N. Mishra, Scientist 'C' virtually demonstrated the research activities, laboratories and infrastructure.	01	01/07/2021	Forest Guards of Van Vidhyalaya, Shivpuri (MP)	35	
2.	Dr. Nanita Berry, Scientist 'E' delivered lecture on 'Plantation	01	22/07/2021	Forest Guards of Van Vidhyalaya, Betul (MP)	55	

	techniques and Agroforestry models developed by TFRI' through virtual mode.						
3.	Sh. A.J.K. Asaiya, Scientist-C, Forest Protection Division delivered lecture on laboratories and infrastructure, TFRI, Jabalpur	01	22/07/2021	Forest Guards of Van Vidhyalaya, Betul (MP)	55		
4.	World Bamboo day	01	17.09.21	Scientists, Technical staff and Research scholars		A timely relevant celebration	and
5.	Demonstrated Gmelina with betel vine based agroforestry system to IFFDC group of Chhattarpur, Sagar and Tikamgarh district of M.P.	2	27/09/2021 to 28/09/2021	IFFDC Group (M.P.)	20		
6.	"Avoid the Use of S Use-plastic" under Azadi ka Mahotsav was organized by the cer Mordongri village, Chhin district Madhya Pradesh		5/10/2021	Youth	24		
7.	"Avoid the Use of S Use-plastic" under ka Amrut Mahotsav v organized by the on at Navodaya Vidhy Chhindwara (M.P.)		8/10/2021	Students of 8 th class Navodaya Vidhyalaya, Chhindwara (M.P.)	80		
8.	"Avoid the Use of S Use-plastic" under ka Amrut Mahotsav v organized by the cen 8/10/2021 at Navodaya Vidhy Chhindwara (M.P.)		8/10/2021	Students of 9 th class Navodaya Vidhyalaya, Singori Village Chhindwara (M.P.)	56		

9.	Demonstration programme organised for B.Sc (Forestry) students FCRI, Hyderabad	1	1/11/2021	B.Sc (Forestry) students FCRI, Hyderabad	45	
10.	Demonstration and hands on training selection and cultivation of host trees for implementing LAC cultivation	1	16/11/2021	Three societies of IFFDC, Sagar, MP.	50	Excellent
11.	An awareness programme under Azadi ka amrit mahotsav 2021 on the occasion of Birsa Munda Jayanti at Rani Durgavatisamdhi place.	1	17/11/2021	Villagers of Narai Village, Jabalpur (MP)	50	Excellent
12.	Demonstration programme organised for ACF trainees of Central Academy of State Forest Service, Coimbatore.	01	24/11/2021	ACF trainees	64	
13.	"Environmental Awareness and Biodiversity Conser- training programme" under Ka Amrut Mahotsav"		9.12.2021	students of ATASH College Management Technology, Pandhurna Chhindwara District (M.P.)	53	
14.	Dr. Nidhi Mehta, ACTO demonstrated botanical garden to students from JawaharNavodaya Vidhyalaya, Bargi Nagar and KV, TFRI on 5 January, 2022.	0.5	05/01/2022	Students	86	
15.	Demonstrations of agroforestry systems, bamboo	1	6/01/2022	A group of 86 Higher Secondary	86	Prakriti Programme

	plantations			students of		
	plantations			Navodaya and		
				DPS School of		
				C		
				January, 2022.		
16.	Demonstrations of	01	07/1/2022	Trainees Range	45	
	agroforestry			Officer		
	systems and					
	Bamboo					
	plantations.					
	A group of Range					
	Officers of					
	Kundalpur Forest					
	Ranger College,					
	Maharashtra on 7 th					
	January,2022					
17.	"Biodiversity	01	13/01/2022	B.Sc and M.Sc	45	
17.	Conservation" training	-	13/01/2022	Students of	40	
	programme" under			Danielson		
	Ka Amrut			College,		
				Chhindwara		
10	Mahotsav	01	21/1/2022		20	
18.	Biodiversity Conserv	01	31/1/2022	B.Sc and	38	
	" under			M.Sc Students		
	Azadi Ka			of ATASH		
	Mahotsav			College		
				Management		
				Technology		
19.	Identification uses	01	07 .02.2022	Jawahar	40	04
	botanical names of			Navodaya		
	various			Vidyalaya,		
	medicinal/aromatic/sl			Chhindwara		
	ree			students (10th)		
	species			std		
20.	Avoid Use of S	01	15.02.2021	Students of Std.	20	
	Plastic & Medicinal			8 th & 9 th class of		
	plants Use,			Govt.		
				Higher		
				Secondary		
				School,		
				Nonia		
				Karbal,		
				Chhindwara		
21.	Diversity of Med	1	16.02.2022	College of	51	
	Plants and Tree			Forestry,		
	Diversity of Chhindw			Punjabrao		
	,			Deshmukh		
				Vishwa		
				Vidyalaya		
				Akola (MS)		
22.	Exposure visit of	01	17.02.22	Entrepreneurs	24	Excellent
	Exposure visit of	O1	11.02.22	Lincorcheurs	~ ¬	LACCHOIL

	Bamboo Entrepreneurs sponsored by Foundation for MSME Clusters, New Delhi					exposure bamboo propagation, nursery, plantations management	of and
23.	Dr. Nanita Berry, Scientist 'F', demonstrated sandalwood based agroforestry system and research activities of TFRI to the group of FRO,2021-22 batch of State Forest Service, Coimbatore (Tamil Nadu)	01	21/03/2022	Ranger Trainees, 2021- 22 batch Coimbatore.	36		
24.	Demonstration of Bamboo Slicer and Bamboo plantation to the members of Foundation of MSME Cluster, New Delhi and Mahrashtra	02	24/03/2022 to 25/03/2022	members of Foundation of MSME Cluster, New Delhi and Maharashtra	25		
25.	Demonstration of research activities of TFRI to the Trainees Rangers from Haldwani	01	29/03/2022	Ranger Trainees of Coimbatore.	30		
	Total	27			1159		

Category = Students, farmers, ladies, officers from SFDs, Members of JFMCs etc.

Format for details on License/ Material Transfer agreements annexure -10

Sl. No.	Name of Technology/	Name of	Name of	Revenue details
	package of practices	<u>species</u>	the party	<u>including</u>
				<u>revenue</u>
				generated and
				mode of
				payment, if any
-	-	-	-	-

- **11.** <u>List of publications Annexure -11 (publications) Please prepare the list in the following order:</u>
- Books

Dr. Darshan K, Scientist-B has published a text book entitled "Phyto Pathological Techniques Basic to Advances (1st ed.)" by Darshan K., Amrutha Lakshmi M., M. Gurivi Reddy. (2021). Self publication, Mysore. ISBN 978-93-5473-629-2

• Booklets/Brochures/Bulletins/ Pamphlets etc.

Chapters in Books/ Proceedings	1. Mr. Manish K Vijay published a chapter on "Nursery Input Management: Present and Future Perspectives" in the book released during HRD training module on 'Nursery development and
	vegetative propagation on 17th -21st Jan. 2022 for ICFRE Technical Staff.
	2. Dr. Darshan K., Scientist- B submitted a Book Chapter: Ganoderma: Biodiversity, Ecological Significances, and its management for Springer's book Fungal diversity, Ecology and Control Management, Vol-I
	3. Rathod Digvijaysinh Umedsinh (2022). A book chapter published on "Nursery Input Management: Present and Future Perspectives" in the book released during HRD training module on 'Nursery development and vegetative propagation' on 17 th -21 st Jan. 2022 for ICFRE Technical Staff.
Booklets/ Brochure/ Bulletins/ Phamphlets	Rathod Digvijaysinh (2022) Miyawaki Plantation: New Technique for Afforestation, Technical Manual , TFRI
	 Kundu, M., Schmidt, L. (Editor), 2021. Bridelia retusa (L.) A. Juss. Seed Leaflet, No. 175, p-1-2.Forest & Landscape, University of Copenhagen, Denmark Kundu, M., Schmidt, L. (Editor), 2021. Buchanania cochinchinensis (Lour.) M.R. Almeida. Seed Leaflet, No. 176, p-1-2. Forest & Landscape, University of Copenhagen, Denmark. Kundu, M., Schmidt, L. (Editor), 2021. Butea monosperma (Lam.) Taub. Seed Leaflet, No. 174, p-1-2.Forest & Landscape, University of Copenhagen, Denmark.

- Kundu, M., Schmidt, L. (Editor), 2021. Saraca asoca (ROXB.)
 Willd. Seed Leaflet, No. 172, p-1-2. Forest & Landscape, University of Copenhagen, Denmark.
- Kundu, M., Schmidt, L. (Editor), 2021. Semecarpus anacardium L.f..
 Seed Leaflet, No. 173, p-1-2. Forest & Landscape, University of Copenhagen, Denmark.

Article in Seminars/ Conferences/ Workshops etc.

Abstracts

- 1. Dr. Nanita Berry and G.Rajeshwar Rao (2022): Two Training manuals on HRD training for ICFRE technical staff on 'Nursery technique and plantation management' and MANAGE training for Agri-enterpreneure on 'Agroforestry and opportunities in Value addition' prepared and published by TFRI.
- 2. Dr.Nanita Berry, G, Rajeshwar Rao & Ekta Barkade(2021). Extraction of Piper oil from *Piper betle* grown under *Gmelina arborea* based agroforestry system besides its value addition. In proceedings in National Conference on 'Value addition and Marketing of NTFPs' held on 16th December, 2021 at Tropical Forest Research Institute, Jabalpur (Madhya Pradesh):125pp
- 3. Dr. Nanita Berry (2021). Conservation of commercially important medicinal herbs through agroforestry for health and wealth of tribal community. In Proceedings of International Conference on Minor Forest Produce for Health Securities from 24-25 December, 2021, Bhopal (MP): 10pp.
- 4. Berry, Nanita; Dilraj, ITK, Dubey, Saurabh and Nikita Rai.(2021). Agroforestry system adopted by farmers of Hoshangabad(Madhya Pradesh) (Virtual Mode) in 3rd International Conference Global Initative in Agriculture, Forestry and Applied Science (Theme Food security, Environment safety and Sustainable Development (GIAFAS-2021) held at Shri Guere Ram Rai University, Dehradun, Uttaralhand, India:
- Shukla Akash and Berry Nanita (2021). "Giloy or Amrita: Boon to Mankind" Abstracts published in Proceedings of National Conference on 'Value Addition and Marketing of NTFPs' pp 125
- Sharga, Parul and Berry, Nanita (2021). Clonal Eucalyptus for Environmental Resilience and Climate Change mitigation. In Proceedings of National

- Conference on 'Clonal Forestry in eco-restoration' held from 10-11 November,2021 at Forest Research Centre, Prayagraj: 91pp.
- 7. Berry, N., Dilraj, I.T.K., Dubey, S. and Rai, N. (2021). Agroforestry system adopted by farmers i Hoshangabad district of Madhya Pradesh in Souvenir Cum Abstract Book (ISBN NO. -978-93-5419-016-2), pp-318.
- 8. Hari Om Saxena*, Samiksha Parihar and Ganesh Pawar (2021). Simultaneous densitometric quantification of betulinic acid, β-sitosterol and lupeol in fruits, leaves, root and stem bark of *Dilleniapentagyna* Roxb. through a validated HPTLC method. Published in souvenir of 2nd International Conference on Recent Advances in Biotechnology and Nanobiotechnology (Int-BIONANO-2022)held held at AMITY University Gwalior on 10-11th Feb., 2022 [OP-30, page no. 35-36].
- 9. Hari Om Saxena (2022). Chemical and morphological variations in *Stereospermum suaveolens* (Roxb.) DC. a RET species and its ex-situ conservation" in online National conference on "Biodiversity and its Utilization and Conservation in Central India" held at GGV Central University, Bilaspur on 21 22nd Feb., 2022 at page no. 05.
- 10. Kundu, M., Tiwari, S., Kahar, L., Gupta, D.K. and Chouhan, S. K. (2022). Germination of Careya arborea Roxb. Seeds with respect to their maturation, desiccation sensitivity and storage response. Published in National Symposium-Cum Workshop on "Biodiversity and Its Utilization and Conservation in Central India" held (In Blended Mode) at GGV, Bilaspur from 21-22 February 2022.
- 11. Aman Kumar A., Prajapati N.(2021). POTENTIAL DISTRIBUTION RANGE AND CONSERVATION STRATEGIES FOR THE ENDANGERED SPECIES TAXUS BACCATA IN HIMACHAL PRADESH, page no.32 in National Conference on "Value Addition and Marketing of NTFPs" 16th December, 2021, Tropical Forest Research Institute, Jabalpur (M.P.))
- 12. Mr. Manish K Vijay published an abstract on "CONSERVATION AND SEED QUALITY ENHANCEMENT OF BUCHANANIA LANZAN SPRING: AN ENDANGERED NWFP SPECIES OF MADHYA PRADESH" in the compendium of National Conference on "Value Addition and Marketing of NTFPs" 16th December 2021, Tropical Forest

- Research Institute, Jabalpur (M.P.)
- 13. Rathod Digvijaysinh (2022) Concept of Miyawaki Plantation to Mitigate Climate Change, Proceedings on 4th Plant Science Research Meet (PSRM 2021) "National Conference on Advance in Plant Science Research, organized by: Plantica Association of plant science research, Dehradun; School of life Sciences, Uttaranchal University, Dehradun; HNB Garhwal University (A central University) Srinagar, Uttarakhand on 20-21 November 2021
- 14. Pramod Kumar, Pawan Kumar Patel and Vimal Pandro (2021) Quality plants of *Dalbergia latifolia* (Roxb.) through user friendly propagation and field planting for Ecological sustenance. In Abstract Book of National Conference on Clonal Forestry in Eco- Restoration (NCCFER-2021), Page 29.
- 15. Kaushal Tripathi, Ravishankar, Satya Prakash, Mukesh Kumar Sonkar and Fatima Shirin (2021) Macropropagation through root cuttings in *Dalbergia latifolia* (Roxb.), an important vulnerable tree species. In Abstract Book of National Conference on Clonal Forestry in Eco- Restoration (NCCFER-2021), Page 38.
- 16. Kaushal Tripathi, Ravishanker, Satya Prakash Tantuway, Mukesh Kumar Sonkar and Fatima Shirin (2021) Macropropagation through root cuttings in *Dalbergia latifolia*, an important vulnarable tree species, In Abstract Book of National conference on clonal forestry in eco-restoration, Prayagraj, Page 38.
- 17. Irshad Ali Saudagar, Vineet Mehra, Trilok Gupta, Nikhil Verma and Fatima Shirin (2021) Macropropagation of *Dendrocalamus strictus* (Roxb.) Nees through culm cavity method,In Abstract Book of National conference on clonal forestry in eco-restoration, Prayagraj, Page 39.
- 18. Surendra Singh Ghoshi, Irshad Ali Saudagar, Shruti Thakre, P K Rana, Trilok Gupta and Fatima Shirin (2021) Selection of CPTs of *Madhuca longifolia* from different agroclimatic zones of Madhya Pradesh for assemblage and conservation,In Abstract Book of National conference on Value addition and marketing of NTFPs,Jabalpur, 16th December, 2021, Page 25.
- 19. Upasana Namdev, Irshad Ali Saudagar, Sharmishtha Gangopadhyay,

- Sushma Maravi, Mukesh Kumar Sonkar and Fatima Shirin (2021) Vegetative propagation of *Plumbago zeylanica* useful RET medicinal plant for conservation, In Abstract Book of National conference on Value addition and marketing of NTFPs, Jabalpur, 16th December, 2021, Page 30.
- 20. Kaushal Tripathi and G Kumar (2021) Mutagenic impact of EMS inciting morphological and cytological influence in Berseem (*Trifolium alexandrinum*), In Abstract Book of XLIV All India Botanical Conference of the Indian Botanical Society. Page 99.
- 21. Irshad Ali Saudagar and Fatima Shirin (2022) Characterization and evolution of conservation practices on phytochemicals in different seasons of *Kaempferia parviflora*, In Abstract Book of Advances in smart agriculture and biodiversity conservation for sustainable development, Jaipur, March 04 06, 2022, Page 235.
- 22. Naseer Mohammad, Ankur Dahayat, Yogesh Pardhi, Fatima Shirin and Yogeshwar Mishra (2021) Clonal fidelity testing of *Eucalyptus* clonal stock using ISSR markers. In Abstract Book of National Conference on Clonal forestry in Eco-Restoration, Prayagraj, 10-11 November, 2021.
- 23. Naseer Mohammad, Rahul Rathore, HO Saxena and M Rajkumar (2021) Assessment of variability and natural regeneration of an endangered Bijasal (*Pterocarpus marsupium* Roxb.) in Madhya Pradesh. In Abstract Book of National Conference on Value addition and marketing of NTFPs, Jabalpur, 15 December, 2021.
- 24. Naseer Mohammad, Yogesh Pardhi, Bilal Miskini and M Rajkumar (2021) Field observations of the endangered Gum Karaya (*Sterculia urens* Roxb.) populations in Madhya Pradesh, India. In Abstract Book of National Conference on Value addition and marketing of NTFPs, Jabalpur, 15 December, 2021.
- 25. Naseer Mohammad, Ankur Dahayat, Yogesh Pardhi, Fatima Shirin and Yogeshwar Mishra (2021) Clonal fidelity testing of *Eucalyptus* clonal stock using ISSR markers. In Abstract Book of National Conference on Clonal forestry in Eco-Restoration, Prayagraj, 10-11 November, 2021.
- 26. Berry Nanita, Barkade, Ekta and Rao G. Rajeshwar (2021). Extraction of Piper oil from *Piper betel* growth under *Gmelinaarborea* based agroforestry system besides its value addition'. Abstracts published inproceedings of

- National Conference 'Value Addition and Marketing of NTFPs' Page No. 55
- 27. Shukla Akash and Berry Nanita (2021). "Giloy or Amrita: Boon to Mankind" Abstracts published in Proceedings of National Conference on 'Value Addition and Marketing of NTFPs' pp 125
- 28. Dr.Darshan K. Submitted and published abstracts on topic "Mushrooms as Non-Timber Forest Products: Improving Tribal's Health and Promoting Quality Life" under the theme III Resources Assessment and Augmentation of NTFPs at NATIONAL CONFERENCE VALUE ADDITION AND MARKETING OF NTFPs organized by TFRI, Jabalpur.

Popular article

- 1. प्रमोद कुमार, पवन कुमार पटैल, मुकेश कुमार सोनकर,(2021) काला शीशम (डलबर्जिया लैटिफोलियाद्ध के उच्च गुणवत्ता युक्त पौधे तैयार करने की कायिक प्रजनन विधि, वन अनुसंधान ई पत्रिका, जनवरी जून 2021.
- 2. प्रमोद कुमार, पवन कुमार पटेल, विमल पैन्द्रो, प्रेम कुमार राना एवं मनोज कुमार पूसाम (2021) सागौन के बीज फलोघानों के उचित वैज्ञानिक प्रबंधन द्वारा अधिक बीज उत्पादन. वन अनुसंधान ई पत्रिका अंक 06 जुलाई दिसंबर 2021.
- 3. कौशल त्रिपाठी दिग्विजय सिंह नीरज प्रजापित निनता बेरी (2021) बांध क्षेत्र: स्वदेशी मधुमिनखयों के संरक्षण और समृद्धि में सहायक . तरुचिंतन 49-51
- 4. डॉफातिमाशिरीनएवंश्रीइरशादअलीसौदागर(2021) जुगन् विलुप्तचमकऔरउसकासंरक्षण . तरुचिंतन83-84
- 5. Article on "वनउद्यानिकीकृषिपद्धतिमेंअमरुदकासततउत्पादन .Taruchintan, a ICFRE publicationbyBerry, Nanita, Dubey,Sourabh; and Nikita Rai, (2020).
- 6. Yogesh Pardhi, ACTO, Minskshi Pardhi, Subhi Mishra, Fatima Shirin and Naseer Mohammad. Popular article: "Critical endangered species *Bacopamonerii*: Micropropagation technique for large scale production" in *VAN SANGYAN*, Vol.-8, No.2, Issue 2021.
- 7. Mamta Meshram scientist-B of the centre, published article on "Growth and yield performance of aonla varieties in Chhindwara district, Madhya Pradesh" Van Sangyan (ISSN2395-468X), Vol.8, No.3,Issue: March 2021.
- 8. Banerjee Saikat and Jain A. (2021). Air Pollution and Possible Remediation. Van Sangyan, 8 (2), 13-22, 2021
- 9. Singh R. and Jain A. (2021). Water Pollution-Its Control. Van Sangyan, 8 (2), 28-35, 2021

- 10. Payal Basu (2021). Effect of pruning on wildlife and micro-organisms. Van Sangyan, 8 (2), 17-23, 2021
- 11. Choubey SK, Saxena HO and Pawar G (2021). किवांच (Mucunapruriens): फलीकासंग्रहण, प्रसंस्करणएवंउपयोग. Van Sangyan, 8(2): 7 12.
- 12. Choubey SK, Saxena HO and Pawar G (2021). चारकोल, प्रसंस्करणएवंलघुग्रहउद्योग, Van Sangyan, 8(3): 27 29.
- 13. Nidhi Mehta and Jain A. (2021). Role of nutrient cycling in forest ecosystems. *Van Sangyan*8 (1),24-29, 2021.
- 14. Pradeep Kori and M. Rajkumar (2021). मध्यप्रदेश में वन वर्धन पद्धति के काय अभ्यास। *E-magazine Van Sangyan*8(2): 36-41, 2021.
- 15. Saikat Banerjee, Sengar K.S. and Jain A. (2021). Acid Rain- A Global Environmental Issue. *Van Sangyan,TFRI*, 8(4), 21-31, 2021.
- 16. Saikat Banerjee, Sengar K.S. and Jain A. (2021). Global warming its causes and remediation. *Van Sangyan*, TFRI, **8** (8): 5-8.
- 17. Saikat Banerjee, Sengar K.S. and Jain A. (2021). Deforestation and Forest Degradation Causes, Effects and Sustainable Solution. *Van Sangyan*, TFRI, **8**(5): 01-15.
- 18. Saikat Banerjee, Sengar K.S. and Jain A. (2021). Environment, its component and issues. *Van Sangyan*, TFRI, **8**(6): 22-35.
- 19. Saikat Banerjee, Jain A. and Shukla P.K. (2021).Soil and Water Conservation on the Growth of Planted Species in Skeletal Soil Some Case Studies (2021). *Van Sangyan*, TFRI, **8**(7): 13-20.
- 20. Saikat Banerjee and S.K. Banerjee Vegetation Succession in Mine Spoils *Vaniki Sandesh, Vol-12 (1,2), 20-27*, January-June 2021
- 21. S.K. Banerjee and Saikat Banerjee Healthy Soil, A Living Ecosystem *Vaniki Sandesh*, *Vol-12* (1,2), 04-13, January-June 2021

Research papers (please include impact factor against each paper)

Published in Indian Journals

- 1. A.J.K. Asaiya, Divyansh Raj and Chokhelal (2021) published a research paper on "Antibacterial effect of *Ponganiapinnata* leaf extract against some Human pathogenic bacteria" in Journal of Plant Pathology & Microbiology Vol 12 Iss 7 No 565.
- 2. Avinash Jain, Nidhi Mehta, M. Rajkumar, Sanjay Singh, Sanjay Komra and G. Rajeshwar Rao Ecorestoration of Tiger Reserves of Central India and its impact on Vegetation Diversity and Community Composition.Indian Forester 148(3):285-295. 2022 (NAAS)5.10
- 3. Banerjee S.K., Banerjee S. and Shukla P.K. (2021). Sustainable forestry with special reference to the management of non-timber forest products for livelihood security of forest dependents communities in tropical region. *Journal of Tropical Forestry*, 37 (III), 01-17, 2021 (July-Sept.)
- 4. Banerjee S.K., Banerjee S., Sahoo T.K. and Shukla P.K. (2021). Changes in Soil Characteristics and Carbon Sequestration

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