



# TFRI NEWSLETTER



VOLUME - 1

JAN-FEB, 2022



## FROM THE DIRECTOR'S DESK

### Greetings from TFRI family

The Tropical Forest Research Institute, Jabalpur is one of the nine regional institutes under the Indian Council of Forestry Research & Education, Dehradun under MoEF&CC.

The institute, along with its satellite centre, FRC- SD, Chhindwara has not only steadily advanced in terms of infrastructure but also specialized itself as a major nucleus for research on forestry and ecology related problems of tropical forests of the central region comprising of the states of Madhya Pradesh, Chhattisgarh, and Maharashtra.

With the efforts of this organization, various technologies have been developed for expanding the tree cover on forest and private lands in Central India. Technologies and protocols developed in the fields of silviculture, agro-forestry, forest protection, biotechnology, tree improvement, and environmental management practices have been extended to user agencies/stakeholders through short and long term training programmes, workshops and awareness programmes. Institute is providing technical skills to forest dwellers and guiding them in enlarging their livelihood opportunities, through sustainable use of forest resource base. Van Vigyan Kendras have been established in the states for transfer of TFRI technologies to the farmers and other stakeholders.

This first issue of TFRI News Letter showcases different activities of TFRI, Jabalpur during January- February, 2022.

I place on record my sincere gratitude to Shri Arun Singh Rawat, IFS, Director General, ICFRE, for his unstinted support and guidance in executing the mandate of the Institute. We are delighted to publish the first issue of TFRI News Letter, showcasing, different activities of TFRI, Jabalpur during January-February, 2022.

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

Dr. G. Rajeshwar Rao, ARS  
Director

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## TRAINING AND CAPACITY BUILDING

### PROGRAMME CONDUCTED AT TFRI UNDER "AZADI KA AMRIT MAHOTSAV"

- Training on "**Plant Biotechnology**" for Scientists, Foresters, Academicians and Students (virtual mode) conducted (5<sup>th</sup>-6<sup>th</sup> Jan, 2022) at TFRI, Jabalpur.
- Forest Research Centre for Skill Development, Chhindwara conducted (13th Jan 2022) training programme (virtual mode) on "**Biodiversity Conservation**" under Azadi ka Amrit Mahotsav for B.Sc. and M.Sc. Students of Danielson College, Chhindwara.
- Human Resource Development training on "**Nursery Development and Vegetative Propagation**" for ICFRE technical staff, held from (17<sup>th</sup> to 21<sup>st</sup> Jan, 2022) (virtual mode).
- Forest Research Centre for Skill Development, Chhindwara conducted online training programme (31<sup>st</sup> Jan, 2022) on "**Biodiversity Conservation**" for B.Sc. and M.Sc. students of ATASH College of Mgmt & Technology, Pandhurna District-Chhindwara.



Training on *Plant Biotechnology*



Training on *Biodiversity Conservation*

## LINKAGE AND COLLABORATION



First three days training programme on "**Agroforestry and opportunity in value addition**" organized with collaboration of **National Institute of Agricultural Extension and Management (MANAGE)**, Hyderabad (15<sup>th</sup> to 17<sup>th</sup> Feb, 2022) at TFRI, Jabalpur.

Bamboo artisans/entrepreneurs and stakeholders from Mizoram, Chhattisgarh and Maharashtra visited at TFRI under program "**Bamboo Entrepreneurs**" sponsored by Foundation for MSME Clusters, New Delhi (17<sup>th</sup> Feb 2022)





### SIGNIFICANT RESEARCH ACTIVITIES

Four Bamboo species viz. *Bambusa tulda*, *B. vulgaris*, *B. nutans* and *B. balcooa* planted at TFRI campus in demonstration plot under AICRP- Bamboo.



Seedlings of Bamboo species raised in the Silviculture nursery for plantation



Transplanted *Bambusa nutans* at TFRI campus for demonstration



Established the *Bambusa tulda* plantation at TFRI campus for demonstration under AICRP on Bamboo



An overview of Bamboo plantation at TFRI Jabalpur

Conducted survey for the collection of data on natural population of *Manilkara hexandra* (Khirmi), *Haldina cordifolia* (Haldu), *Terminalia chebula* (Harra), *T. tomentosa* (Saj), *Garcinia indica* (Kokum), distributed in the Raigada circle of Maharashtra to conserve Forest Genetic Resources



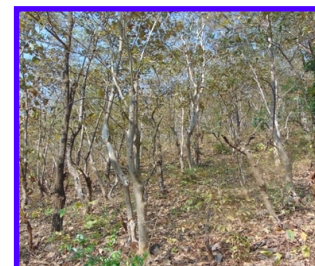
Collection of data of *Terminalia tomentosa* in Raigada circle



*Anogiesus latifolia* distribution in moist deciduous forest, Raigada circle (Maharashtra)



Natural distribution of *Garcinia indica* in Raigada forest circle



Distribution of *Sterculia urens* in Raigada forest circle

A pilot survey for impact assessment of impact of *Lantana camara* removal in forest area of Baster and Marwahi forest division of Chhattisgarh was conducted to establish experimental plots.



Vegetation survey of lantana removed area



Evaluation of field site : TFRI team with Chhattisgarh Forest Deptt.



- Tubers of *Curculigo orchioides* (kali musli) were collected from 11 Medicinal Plant Conservation Areas (MPCAs) of 10 agroclimatic regions of Madhya Pradesh and recorded morphological variations.
- Curculigoside, an active ingredient was quantified in tuber samples using HPLC technique. Chemical marker cuculigoside was found higher in rhizome samples of MPCA Budhni, Sehore (M.P.).



Kali musli samples from 04 different MPCAs



Establishment of tubers in field.

- Developed protocol for isolation of natural dyes from *Careya arborea* bark and *Woodfordia fruticosa* flowers.
- Collected wood flow information of households in 20 villages of Chhattisgarh.

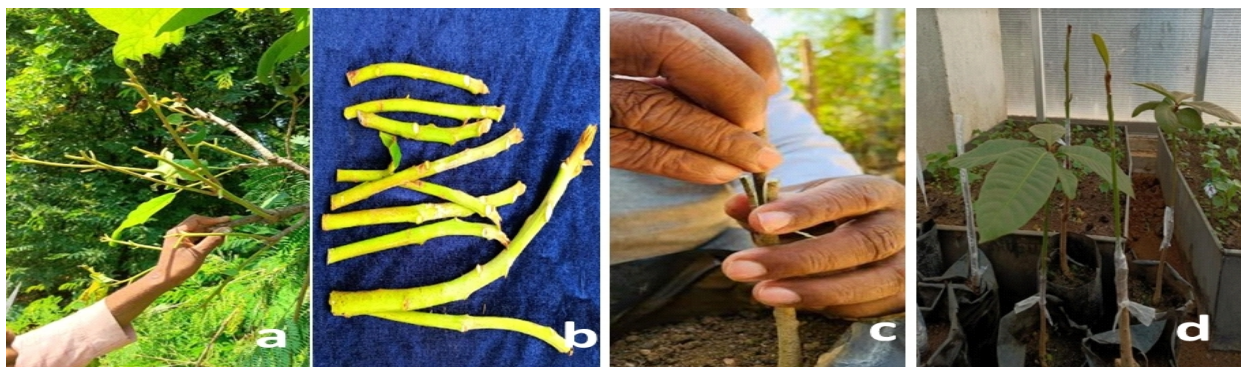


Energy bars has been prepared from *Madhuca longifolia* (Mahua) flowers with additive.

Mosquito repellent Agarbatti sticks were developed using plant based various combination of plant materials. Mosquito repellent testing of all these developed agarbatti sticks is under progress.



- To conserve Forest Genetic Resources, 20 trees each of *Pterocarpus marsupium*, *Bridelia retusa*, *Haldina cordifoila*, *Boswellia serrata*, *Mitragyna parvifolia*, and *Buchnanania lanzan* and 7 trees of *Cordia macleodii* were selected from Khairagarh forest division, Chhattisgarh for collection of seeds and establishment of field gene bank.
- Selection of scions was done from 10 selected superior trees of Mahua from Dindori and Mandla, Madhya Pradesh. Cleft grafting was carried out in 40 root stocks.



Cleft Grafting Technique, a) Scion selection, b) Collection, c) Cleft grafting and d) Grafted





- In vitro* aseptic cultures were established through bud inoculation of clones PT-46 from Clonal Seed Orchard of Teak located at TFRI Jabalpur.



Observation of Plantation at, A), B), C) Banjar, D) Bargi, Madhya Pradesh, E) Shoot multiplication in clone-2, F), G) clone-5, and H) bud of clone CH SPA 20 in test tube.

Evaluation trials of *Melia dubia* 50 improved genotypes have been established in five selected sites viz. Morena and Chhindwara (Madhya Pradesh), Nagpur and Amravati (Maharashtra) and Durg (Chhattisgarh)

Selected three Candidate Plus Clumps (CPCs) and rhizomes of *Bambusa balcooa*, *Bambusa tulda*, *Bambusa nutans* and *Bambusa vulgaris* from Kalinga, Odisha and their rhizomes were collected and planted in the Germplasm Bank at TFRI, Jabalpur.

Six CPCs of *Bambusa nutans*, *Bambusa vulgaris*, three CPCs of *Bambusa tulda* and rhizomes were collected from Khandagiri, Odisha and their rhizomes and planted in the Germplasm Bank at TFRI, Jabalpur.



Selected CPCs of A) *Bambusa balcooa*, B) *B. nutans*, C) *B. balcooa*, D) *B. tulda* at Kalinga, Odisha, E) *B. tulda*, at Devas, Madhya Pradesh, F) *B. nutans*, G) *B. balcooa* at Amravati (MH)





A plantation of *Bambusa bambos* at Kacharwar, Umaria, Madhya Pradesh in 3 hectare land was carried out and Field experiment was established at farmers field in Manpur, M.P.



Plantation at Kacharwar & Umaria (M.P.)      Plantation at farmer's field, at Manpur, Umaria (M.P.)

### Assessment of water requirement of different forest tree species and its impact on subsoil moisture

Two Automatic Weather Station have been installed at Moiya Nala, West Mandla and TFRI Campus.

Field demonstration of Leaf Water Potential System was done at TFRI, Jabalpur to conduct experiment on water requirement of four species.:

1. *Shorea robusta*,
2. *Tectona grandis*,
3. *Pterocarpus marsupium*,
4. *Terminalia arjuna*



### Study of Climate Driven Effects on Indian Forests through Long term monitoring.

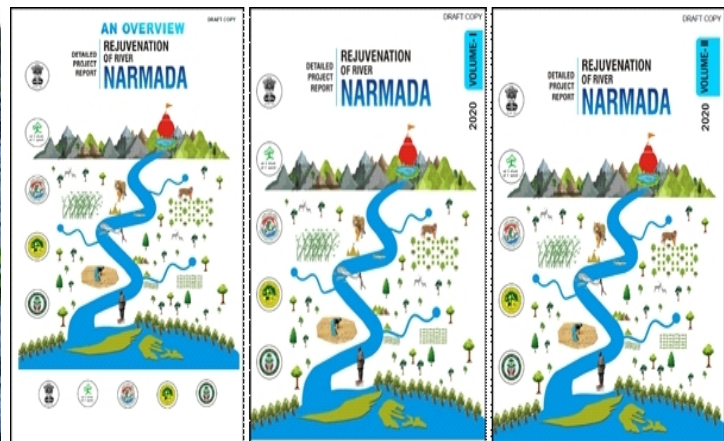
Soil sample collection was initiated in the 10 ha plot and 30 homogenized samples of 54 pits from 6 ha were collected for analysis.





## Preparation of Detailed Project Report on Rejuvenation of River Narmada through Forestry Interventions

Tropical Forest Research Institute has recently completed an ambitious project on titled "Preparation of DPR on Rejuvenation of River Narmada through Forestry Interventions" and proposed forestry interventions in three landscapes: Natural, Agricultural and Urban for different forest divisions from where river Narmada traverses covering the states of Chhattisgarh, Madhya Pradesh, Maharashtra and Gujarat. The projected financial outlay of 5year implementation project is estimated at Rs 2127.28 crore. The DPR will be released by the Hon'ble Minister, The Ministry of Environment, Forest and Climate Change, New Delhi.



## Study of Climate Driven Effects on Indian Forests through Long term monitoring.

Phenological study was carried out in 128 trees of 11 dominating tree species. The selected trees were geotagged and collected the first set of data viz. height, GBH and phenological stages of leaves, flowers and fruits.



## Combating desertification by enhancing vegetation cover and people livelihoods in degraded drylands and deserts of India

Tropical Forest Research Institute has installed Automatic Weather Station at Berkheda Forest Chowki, Satalgarh Range, Morena Forest Division under the All India Coordinated Research Project..





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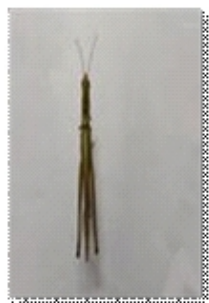
### Three new insect pest-

*Leptocorisa acuta*, *Anoplanemus phasiana* and *Calitettix versicolor* were recorded on *Bamboosa tulda*, observed holes and discoloration of leaves.

### Insect pests -

(*Notobius melegris*, *Hieroglyphus banian*, *Pelopidas mathias*, *Pyrausta coclesalis* and *Estigmaena chinensis*) were recorded on bamboo species, viz., *Dendrocalamus*, *D.strictus*, *Bambusa nutans* in nursery as well as in plantation

- Two isolates of *Trichoderma spp.* isolated and tested antagonistic activity against *Fusarium spp.*
- Experiment was conducted for multiplication of *Trichoderma spp.* on weeds, fallen leaves and twigs.
- Antagonistic activity of Biofertilizers (a) Potash Mobilizer vs. *Fusarium oxysporum*, *Fusarium solani*, *Phytophthora*, *Armillaria*. (b) AM Fungi vs. *Fusarium oxysporum*, *Fusarium solani*, *Phytophthora*, *Armillaria* were analysed.



Adult of *Hieroglyphus banian*  
Congregation of *Anoplanemus phasiana*  
on bamboo shoot



Adult of *Pelopidas mathias*



Larvae of  
*P. coclesalis* and its  
damage symptom



Adult of *Notobitus melegris* and its  
damage

## International Projects / Grants:

**USAID Project- "Interventions to enhance area under trees Outside forest (ToF) in India for improving carbon stock, agro-biodiversity and livelihood for farming communities"** has been granted to Tropical Forest Research Institute, Jabalpur, with financial outlay - Rs 1.87 crores.



Submitted a project titled "**Enhancing livelihoods of forest-dependent communities through sustainable management and utilization of non-timber forest products in India**" with financial outlay - Rs 3736.70 lakhs to Japan's international cooperation agency (JICA), project is under consideration.



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## MEMORANDUM OF UNDERSTANDING



ICAR-Indian Institute of Soil and Water Conservation Research Center , (IIWCRC), Datia  
International Centre for Research in Agroforestry (WAC), Nairobi, Kenya

## CONSULTANCY

- Preparation of Wildlife Conservation including endangered species Sloth Bear and Monitor Lizard and other if any and comprehensive study of the impact of wildlife for Churha Colliery and Katkona Colliery, SECL Baikunthpur Area (Chhattisgarh)
- Wildlife Conservation Plans for Bhatgaon UG, Mahamaya UG, Kalyani UG and Dugga OCM of SECL Bhatgaon Area (Chhattisgarh)
- Study of flora and fauna and preparation of Wildlife 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)
- Preparation of Wildlife Conservation Plan for Endangered Species found in and around Dhelwadhih UG, Bagdeva UG and Singhali UG mines of DSB Sub Area, SECL Korba Area (Chhattisgarh)
- Monitoring of NTPC Ltd. Accelerated Afforestation Programme of Plantation of 10 Million Trees – In Seven States (M.P. and Maharashtra)
- Implementable forestry research for ash utilization promotion and development of research park at APML, Gondia
- Pilot study on raising short rotation forestry crops for intermittent periods at Dubuna. Sakradihi Iron and Manganese Ore Mines in Keonjhar District of Odisha".
- Development of Standard Operating Procedures for Developing Quality Planting Material for State Forest Department, Odisha.
- Monitoring and Evaluation of CAMPA work under APO in Chhattisgarh region 2020-21 ( Part I, II, III).

## VISITS OF DIGNITARIES

Shri Bal Krishna Pathak, Chairman, Chhattisgarh Tribal Local Health Traditional and Medicinal Plant Board visited (18.02.2022) TFRI, Jabalpur.



## EXPOSURE VISITS

Students of Navodaya Vidyalaya and Kendriya Vidyalaya Bargi Nagar, Jabalpur visited (05.01.2022) TFRI, Jabalpur.







### EXTENSION ACTIVITIES (SFD/INDUSTRIALIST/OTHERS)

- Conducted four (4) training on “Management of sal heartwood borer *H. spinicornis* “ for the front line staff of forest divisions of South Kondagaon on 21.12.21 amabeda, East Bhanupratapur on 23.12.21, range mainpur on 25.12.21 and navagarh on 26.12.21, Ghariyaband forest division (Chhattisgarh)
- Demonstrated categorization of borer affected trees and trap tree operation for management of borer beetles. Distributed leaflet on sal borer, categorization of borer affected trees and trap tree operation during the training programmes.



Field demonstration of management of Sal heart wood borer in Sal tree at Navagarh range Chhattisgarh



Field demonstration of tree trap method at Amabeda range, South Kondagaon Forest Division Chhattisgarh



Identification of various life stages of Sal Borer at Amabeda range, South Kondagaon Forest Division Chhattisgarh

- Demonstrated symptomology of insect attacks to the field staff of the State Forest Department and imparted training and demonstration of TFRI - Trichocard technique developed by TFRI, Jabalpur .



Demonstrated symptomology of insect attack to front line staff of SFDs at Mainpur range, Chhattisgarh.

### WORKSHOP/LECTURES

A Webinar on "Zero Budget Natural Farming" was organized on January 7th, 2022, was delivered by Mr. Rathod Digvijaysingh, Scientist-B from TFRI.



### EVENTS ORGANISED/PARTICIPATED

TFRI contributed posters and live material (Tricho cards) for “*Vigyan Sarvatra Pujiyate*” under Azadi ka Amrit Mahotsav organized at Pragati Maidan , New Delhi on 22<sup>th</sup>-28<sup>th</sup> Feb, 2022.

### PUBLICATIONS

- ✦ Mohammad, N., Dahayat, A., Pardhi, Y., Rajkumar, M., Ansari, S.A. and Shirin, F. (2022). Inferring genetic diversity and population structure of India's Natural Teak (*Tectona grandis* L.f.) Germplasm bank." in Genetic Resources Crop Evolution, 69:1695-1705.<https://doi.org/10.1007/s10722-021-01335-w>.
- ✦ Mohammad, N., Dahayat, A., Pardhi, Y. and Rajkumar, M. (2022). Morpho-molecular diversity assessment of Indian Kino (*Pterocarpus marsupium* Roxb.). *Journal of Applied Research on Medicinal and Aromatic plants* , 29, 100373.<https://doi.org/10.1016/j.jarmap.2022.100373>
- ✦ Saxena, H.O., Parihar, S. and Pawar, G. (2021). Simultaneous determination of betulinic acid ,  $\beta$ -sitosterol and lupeol in fruits ,leaves, root and stem bark of *Dillenia pentagyna* Roxb. by a validated high- performance thin –layer chromatography method. *JPC- journal of planar chromatography- Modern TLC*, 34(6):531-42.
- ✦ Saxena, H.O., Parihar, S., Pawar, G., Rao, G.R., Sahu, V.R. and Dhar, P. (2021). Comparative analysis of phenolic content in *Solanum indicum* L.harvested from different locations of Madhya Pradesh state of India. *Environment Conservation Journal*, 22(3):415-21.
- ✦ Shirin, F., Bhadrawale, D., Saudagar, I.A., Rana, P.K., Mohammad, N. and Rao, G.R. (2020). "Influence of localities and tree girth classes on morphological and biochemical parameters of fruits and seeds of *Madhuca longifolia*. *Indian Journal of Tropical Biodiversity*, Vol.28 (1&2):31-40.
- ✦ Yadav, R.S., Dahayat, A., Mohammad, N., Mishra, J.P., Shirin, F. and Rao, G.R.(2020). "Assessment of genetic diversity and relationship among different bamboo species revealed by molecular markers. *Indian Journal of Tropical Biodiversity*, Vol.28 (1&2):41-48.
- ✦ Tripathi, K., Kumar, G., Mishra, M., Shirin, F. and Verma, N.(2020). "Cyto-phenological study of natural population of *Butea monosperma* (Lam.) Taubert (Palas) in the campus of Tropical Forest Research Institute, Jabalpur, MP. *Indian Journal of Tropical Biodiversity*, Vol.28 (1&2):57-64.
- ✦ Mohan, C. and Sowmyapriya, S. (2020). Study on *invitro* pathogenicity of various semi synthetic media on pathogenicity of *Metarizium anisopliae* against *Spodoptera litura*. *Indian Journal of Tropical Biodiversity*, 28(1&2):94-96.
- ✦ Banerjee, S., Rajkumar, M. and Banerjee, S.K. (2020). Healthy Soil- A Living Ecosystem for Agricultural and Environmental sustainability. *Indian Journal of Tropical Biodiversity*, 28(1&2):1-11.
- ✦ Berry, N. and Meravi, I. (2020). Performance of *Asparagus racemosus* and saponin content under Gmelina based agroforestry system. *Indian Journal of Tropical Biodiversity*, 28 (1&2):89-92.





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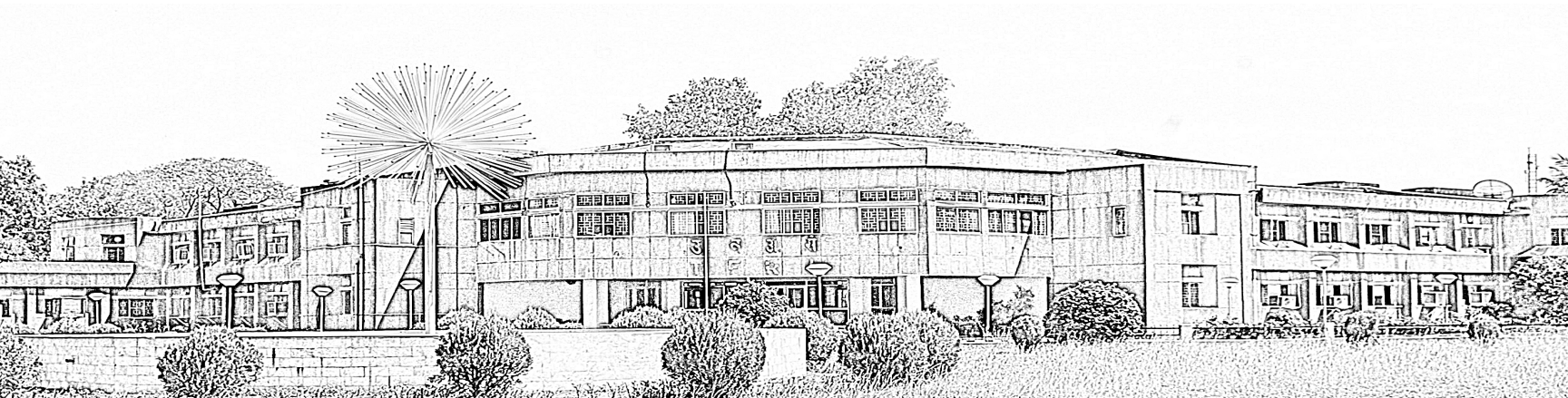
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## CORE RESEARCH AREAS

Eco-restoration of Vindhyan, Satpura and Maikal hills and Western Ghats,  
Rehabilitation of mined areas

- Development and demonstration of agroforestry models
- Forest protection
- Biofertilizers and biopesticides
- Non-wood forest products
- Biodiversity assesment, conservation and development
- Sustainable forest management
- Planting stock improvement
- Climate Change
- Environmental amelioration
- Forest Products Development
- Forest Extension

