

## Introduction

Indian Council of Forestry Research and Education (ICFRE), an apex body in the national forestry research system, has been undertaking the holistic development of forestry research through need based planning, promoting, conducting and coordinating research, education and extension covering all aspects of forestry. The Council deals with the solution based forestry research in tune with the emerging issues in the sector, including global concerns such as climate change, conservation of biological diversity, combating desertification and sustainable management and development of resources. Topical research by the Council enhances public confidence in the ability of forest managers and researchers to successfully handle challenges related to natural resource management.

### Objectives of ICFRE

- \* To undertake, aid, promote and coordinate forestry education, research and their applications.
- \* To develop and maintain a national library and information centre for forestry and allied sciences.
- \* To act as a clearing-house for research and general information related to forests and wildlife.
- \* To develop forestry extension programmes and propagate the same through mass media, audio-visual aids and extension machinery.
- \* To provide consultancy services in the field of forestry research, education and allied sciences.
- \* To undertake other jobs considered necessary to attain these objectives.

### Institutes and Centres under the Council

ICFRE has eight Regional Research Institutes and four Research Centres located in different bio-geographical regions of the country to cater to the forestry research needs of the nation. The regional research Institutes are located at Dehradun, Coimbatore, Bangalore, Jabalpur, Jorhat, Jodhpur, Shimla and Ranchi and the centres are at Allahabad, Chhindwara, Hyderabad and Aizawl.

#### Research Institutes under the Council are:

- \* Forest Research Institute (FRI), Dehradun
- \* Institute of Forest Genetics and Tree Breeding (IFGTB), Coimbatore
- \* Institute of Wood Science and Technology (IWST), Bangalore
- \* Tropical Forest Research Institute (TFRI), Jabalpur
- \* Rain Forest Research Institute (RFRI), Jorhat
- \* Arid Forest Research Institute (AFRI), Jodhpur
- \* Himalayan Forest Research Institute (HFRI), Shimla
- \* Institute of Forest Productivity (IFP), Ranchi

#### Advanced research centres under the council are:

- \* Centre for Social Forestry and Eco-Rehabilitation (CSFER), Allahabad
- \* Centre for Forestry Research and Human Resource Development (CFRHRD), Chhindwara
- \* Forest Research Centre (FRC), Hyderabad
- \* Advanced Research Centre for Bamboo and Rattans (ARCBR), Aizawl



## Salient Achievements/Highlights of Research by ICFRE and its Institutes

### ICFRE

- \* Quinquennial Review System for independent review of schemes, projects and institutes/centers adopted.
- \* 'Consultancy Rules' finalized and adopted.
- \* Finalized B.Sc. Forestry Syllabus in consultation with State Agricultural Universities and sent it to ICAR for concurrence.
- \* Barrier analysis study for CDM A/R projects under EU-India Small Projects Facility Programme conducted.
- \* Participation in the UNFCCC Workshop on "Reducing Emissions from Deforestation in Developing Countries" at Rome, Italy.
- \* Participation in the United Nations Climate Change Conference (COP12/MOP 2) held at United Nations Office in Nairobi, Gigiri, Africa.
- \* DG, ICFRE attended second workshop on "Reducing Emissions from Deforestation in Developing Countries", from 7<sup>th</sup> to 9<sup>th</sup> March 2007 at Cairns, Australia.
- \* ICFRE is working for grant of ISO 9001:2000 Certification. The first audit by internal auditors was conducted from 11<sup>th</sup> to 13<sup>th</sup> July 2006. A shadow audit was also conducted on 7<sup>th</sup> and 8<sup>th</sup> August 2006 by the Consultancy Development Centre (CDC), New Delhi.
- \* The Council based on information received from regional ICFRE institutes and State Forest Departments, prepared a brochure "Miniature Nature (Preservation Plots) A Status Report of India".
- \* Execution of a comprehensive project on "Samudai Adharit Samanvit Van Prabandhan Evam Sanrakshan Yojana in Bihar State" (Phase-I) in coordination with Environment and Forest Department of Bihar State.
- \* Provided Rs. 700.00 Lakhs as Grant-in-Aid to 22 universities in the financial year 2006-2007.
- \* Establishment of a nation wide network to facilitate collection, processing and dissemination of statistics pertaining to tropical timber and other forestry products parameters in India through ITTO funded project.
- \* RPC of ICFRE has approved 109 projects to be carried out under plan projects.
- \* The Council conducted Environmental Impact Assessment studies and formulation of Environmental Management Plan for Kotlibhel, Stage-II (530 MW), National Hydroelectric Power Corporation, Tehri/Pauri Garhwal Project.
- \* The Council conducted Rapid Environment Impact Assessment studies in Chandigarh Industrial Area, Phaselll for Chandigarh Administration, Chandigarh.
- \* Conducted monitoring and evaluation of projects funded by the Department of AYUSH, National Medicinal Plants Board under Promotional Commercial and Contractual Schemes being implemented by various agencies nationwide (except for central India).

### INSTITUTES

- \* Forest Research Institute (FRI), Dehradun conducted cultural studies, effect of pH, pathological resistance testing and fungicidal sensitivity, for 53 isolates of *Fusarium solani* collected from all over the country.
- \* FRI, Dehradun identified best performing clones of *Dalbergia sissoo* raised at Clonal Seed Orchard and Seedling Production Area, Bhitmera, Hissar (Haryana) (1997).



- \* FRI, Dehradun evaluated the health parameters of trees growing in New Delhi Municipal Council (NDMC), and suggested suitable management practices for up keep of trees.
- \* Institute of Forest Genetics and Tree Breeding (IFGTB), Coimbatore has developed a prototype database VAM WAMP environment namely “The *In Silico* Gene Bank for Abiotic Stress Tolerance - TIGBAST” for retrieval of information for salt tolerant genes.
- \* IFTGB has established two unpedigreed seedlings seed orchards one each of *Eucalyptus camaldulensis* and *E. tereticornis*, and a provenance - progeny trial of *E. tereticornis* in different locations in South India.
- \* IFTGB has standardized agroforestry models for black gram, horse gram and fodder sorghum with *Accacia mangium*.
- \* IFTGB has established Aonla based agroforestry models in farmers' fields with medicinal plant *Withania somnifera*.
- \* IFTGB reported the incidence of an invasive insect pest *Leptocybe invasa* Fisher and La Salle (Hymenoptera: Eulophidae) in *Eucalyptus* plantations, for the first time.
- \* IFTGB has standardized selection criteria for plus trees of *Terminalia chebula*.
- \* IFTGB has standardized estimation methods of active biochemical compounds for *Terminalia bellerica*.
- \* IFTGB has established 31 ha plantations of *Casuarina equisetifolia* in Andaman Group of Islands to stabilize the coastline.
- \* Institute of Wood Science and Technology (IWST), Bangalore collected data on 426 plant species out of which 26 lesser-known potential plant species were collected for the first time from the tribes of Godavari valley. A rare cane, *Calamus latifolius* Roxb. was collected for the first time from southern India.
- \* IWST has developed a simple, less expensive, user friendly and field oriented colour reaction for identification of high yielders in sandal.
- \* A total of 344 insect species belonging to 12 orders have been identified from the 6 selected sandal provenances by IWST.
- \* Studies commissioned by IWST on the sucking insect pests' complex of sandal exposed 73 species breeding on sandal. Out of these 14 species were reported for the first time.
- \* IWST published a book entitled “A guide to some imported timbers in south Indian markets” containing 25 species of imported timbers.
- \* Tropical Forest Research Institute (TFRI), Jabalpur found that supplementing egg parasitoid, *Trichogramma raoi* in teak seed orchards has proved effective to minimize the intensity of pest attack and loss in annual growth.
- \* TFRI, Jabalpur prepared and submitted compendium on Achanakmar Amarkantak Biosphere Reserve to Ministry of Environment and Forests, Government of India.
- \* TFRI, Jabalpur identified new genera of fungi, *Acrodictiella* and *Kamalomyces*, reported for the first time and new to the science world.
- \* TFRI, Jabalpur screened four strains of *Ganoderma lucidum* for enzyme production, which has medicinal value.
- \* TFRI, Jabalpur has standardized cultivation techniques of *Rauvolfia serpentina*, *Andrographis paniculata*, *Gymnema sylvestre* and *Tinospora cordifolia*.
- \* TFRI, Jabalpur has developed non-destructive harvesting practices of *Terminalia arjuna*, *Rauvolfia serpentina*, *Andrographis paniculata*, *Gymnema sylvestre* and *Tinospora cordifolia*.



- \* TFRI, Jabalpur developed tissue culture protocols of *Bambusa nutans* and *Bambusa tulda*.
- \* Rain Forest Research Institute (RFRI), Jorhat conducted studies on reclamation of highly eroded site of Cherrapunjee, Meghalaya using *Alnus nepalensis* and *Ex-bucklandia* with a survival percentage of 90.8% and 75.18% respectively.
- \* Population fluctuation of *Calopepla leayana* on *Gmelina arborea* was studied in and around Jorhat, by RFRI. The population trend was correlated with abiotic factors indicating significant dependence on temperature, relative humidity, and rainfall. Entomopathogenic fungus, *Beauveria bassiana* was isolated and identified as an effective natural pathogen against the larval and adult stages of *C. leayana*.
- \* Arid Forest Research Institute (AFRI), Jodhpur has developed generalised height-diameter equations for *Tecomella undulata* plantations in IGNP area of Rajasthan State to assess the growth parameters.
- \* AFRI, Jodhpur developed potential density and basal area projection models for *Acacia nilotica* and *Eucalyptus* hybrid plantations in Gujarat State.
- \* AFRI, Jodhpur developed a method for identification of the right stage immature embryo containing unripened seeds of Guggal (*Commiphora wightii*) for initiation of the embryogenic callus cultures. This method enables establishment of callus with higher somatic embryogenesis rate.
- \* Himalayan Forest Research Institute (HFRI), Shimla has developed macro-proliferation technique for *Picrorhiza kurrooa* and *Valeriana jatamansi* in the nursery.
- \* HFRI, Shimla has designed and fabricated a nursery implement namely 'Multiple Nursery Planting Bar' for maintaining desired spacing of *Valeriana jatamansi* in the nursery.
- \* HFRI, Shimla recorded occurrence of two species of mites, viz., *Panonychus ulmi* (Koch) and *Tetranychus urticae* (Koch), normally recognized as pests of Apple in Himachal Pradesh, in *Valeriana jatamansi* Jones an important medicinal plant of temperate Himalayas which caused severe damage to its foliage in the nursery conditions.
- \* HFRI, Shimla recorded defoliation in willow - locally known as Dokchang - plantations along Shyok and Indus rivers falling in Khalsi and Nubra Forest Ranges of Leh Forest Division, Ladakh, due to out-break of *Clostera cupreata* Butler (Lepidoptera: Notodontidae) insect.
- \* HFRI, Shimla recorded occurrence of *Datisca cannabina* (Akalbir) which belongs to the family Daticaceae and is generally distributed in temperate Himalayas from Kashmir to Nepal, in cold desert area of Pooh Sub division of District Kinnaur, Himachal Pradesh. The species was also found in the moist locations along the nallah in Chila top area of Pooh valley at an elevation of 3,100 m above msl. The plant is endangered in Himachal Pradesh as per Conservation Assessment and Management Prioritization (CAMP).
- \* Institute of Forest Productivity (IFP), Ranchi developed a low-cost, simple and quick technique for compost production.
- \* IFP, Ranchi prepared a book on 40 species of medicinal plants on their propagation, cultivation and use for various target groups.