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RESEARCH ARTICLE

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ROLE OF FOREST RESEARCH INSTITUTE (FRI) OF INDIA IN EXPANSION, PROTECTION AND CONSERVATION OF FOREST COUNTRYWIDE FOR ECONOMIC & SUSTAINABLE DEVELOPMENT

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ABSTRACT

Forest Research Institute stands as a leading institution dedicated to Forestry Research & Education. Initially named as Imperial Forest Research Institute and colleges, it had a number of Centres located at different places all over the country administering research as well as training of forest officers and forest rangers. It was conferred the status of Deemed University in December 1991 on the recommendations of the UGC, Ministry of Human Resource Development, Government of India. The mission of the Forest Research Institute Deemed to be University is to advance education in Forestry and Environmental Sciences across various disciplines. Students here are benefitted from dedicated faculty with extensive field experience and are actively involved in teaching and impactful research. The University is offering four different disciplines in M.Sc. programmes which are thoughtfully designed to keep pace with the constantly evolving fields of Forestry, Environment Management, Wood Science & Technology and Cellulose & Paper Technology. Beyond academics, students participate in a variety of activities like library sessions, sports, cultural events, wildlife week celebrations, and nature clubs, all contributing to their holistic development. The M.Sc. and Ph.D. Programmes in Forest Research Institute (Deemed) University are well designed to cope with the ever-dynamic field of Forestry, Environment Management and Wood Science & Technology.

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INTRODUCTION

The Forest Research Institute (FRI) is a Natural Resource Service training institute of the Indian Council of Forestry Research and Education and is an institution in the field of forestry research in India for Indian Forest Service cadres and all State Forest Service cadres. It is located at Dehradun in Uttarakhand, and is among the oldest institutions of its kind. In 1991, it was declared a deemed university by the University Grants Commission. The Forest Research Institute campus hosts the Indira Gandhi National Forest Academy (IGNFA), the staff college that trains officers selected for the Indian Forest Service (IFS). Established as Imperial Forest Research Institute in 1906, the Forest Research Institute (FRI) Dehradun, was first located on the Mall Road. Styled in Greco Roman Architecture by C.G. It is now a National Heritage site. It is of the biggest forest based training institute in India. The FRI's building also houses a Botanical Museum. "Forest Research institute (FRI), Dehradun" has its roots in the erstwhile Imperial Forest Research Institute established in 1906 to organize and lead forestry research in the country. Its history is synonymous with the evolution and development of scientific forestry not only in India but in the entire Indian subcontinent. The institute also administered training to forest officers and forest ranger in the country and after independence it was

aply named as Forest Research Institute and Colleges. In 1988, FRI and its research centres were brought under the administrative umbrella of Indian Council of Forestry Research Education (ICFRE) under the Ministry of Environment, Forests and Climate Change, Government of India. The institute, set in sylvan surroundings of the Doon Valley, has a campus spread over about 500 hectares. The main building completed in 1929, is an impressive edifice of the Greco Roman and Oriental architecture having a plinth area of 2.5 hectares, with the outer Himalayas forming its backdrop. It is a major tourist attraction in Dehradun. This marvellous structure was inaugurated in the year 1929 by the then Viceroy of British India, Lord Irwin. The tryst with forestry research in British India started much earlier when in 1864, Forest rangers' school was set-up in Dehradun. The school and its subsequent avatars (eventually leading to the setting up of FRI in 1906) had a two-fold objective a). developing a dedicated ecosystem for scientific research and b). creating a supply of specially trained forest officers. In its early days, emphasis was more on botany, wood anatomy and utilization of timber and non-timber forest produce. Dr. Dietrich Brandis, who was the Inspector General of Forests in India between 1864 and 1883, gave great impetus to forestry research and paved a way for a dedicated FRI, a few years down the line.

History: In 1864, Ranger's college was set-up in Dehradun. Remnants of the college can still be seen in a complex just behind the Tibetan market (opposite Parade Ground). In 1884, the school was taken over by the then Central Govt. and was renamed as the Imperial Forest School. IFRI complex (year 1922) at Chandbagh which is now Doon School. On 5th June 1906, this was rechristened as the Imperial Forest Research Institute (IFRI). From 1906 to 1923, the IFRI operated from a campus in Chand bagh area of Dehradun. This building is now a part of the renowned *Doon School*. In 1923, the IFRI was shifted further west, to its current sprawling campus (of over 1,100 acres). The magnificent main building that we see today was built between 1923 and 1929. Mr. C G Bloomfield was the chief architect of this building, and he laid great emphasis on using locally available material for the structure. Meticulous planning was done to ensure no damage happens given the harsh climatic conditions (especially the rains) that Dehradun saw in those times. Note – Mr. C G Bloomfield also designed the famous *Jaipur House* building, located in the heart of Lutyens' Delhi. On 7th November 1929, His Excellency Lord Irwin (then Viceroy of British India) inaugurated the new building at FRI. To meet the growing food demand during WWII – FRI campus was used to grow wheat. Forest Research Institute (FRI), Dehra Dun made a humble beginning as Forest School established in 1878. Initially named as Imperial Forest Research Institute, FRI came into being in 1906. Later renamed as Forest Research Institute and Colleges, with a number of centres located at different places all over the country administering research as well as training of Forest Officers and Forest Rangers. After reorganization of Forestry Research in the country and creation of Indian Council of Forestry Research and Education (ICFRE) in 1988, the training and research centres were given an independent status of institutes. Forest Research Institute, now one of the institutes under ICFRE, was conferred the status of Deemed University in December 1991 on the recommendations of the UGC, Ministry of Human Resource Development, Government of India. Dehradun is truly wonderful place to be associated with. It has friendly and helpful people, an abundance of recreational opportunities and places to see and visit. The open countryside, hills and mountains of Dehradun has a reputation being the educational capital of the country. Dehradun has a sub-tropical climate with cool winters, warm and crisp springs, hot summers and a strong monsoon. With over 200 years of history, Dehradun's proudest moment came in November 2000, when the town became the capital of Uttarakhand, understandably termed as Dev Bhoomi (abode of the Gods). The city is 240 Kms away from New Delhi and is well connected by road, rail and air. The University is located in FRI campus on Kaulagarh road in Dehradun.

Timeline: It was founded in 1878 as "Forest School of Dehradun", after that its name changed to "Imperial Forest School" in 1884. by Dietrich Brandis. In 1906, it was reestablished as the Imperial Forest Research Institute, under the British Imperial Forestry Service. Established as Imperial Forest Research Institute in 1906, the Forest Research Institute (FRI) Dehradun, was first situated at Chandbagh (the present location of the Doon School) on the Mall Road. A much larger campus at the present location was acquired in 1923. Construction of the new buildings commenced thereafter. Styled in Greco-Roman Architecture by C.G. Blomfield, the main building was inaugurated in 1929 by then Viceroy. It is now a National Heritage site. Forest Research Institute Dehradun is among the oldest institutions of its kind. The institute's history is virtually synonymous with the evolution and development of scientific forestry, not only in India, but over the entire sub-continent. Built over 450 hectares, with the outer Himalaya forming its backdrop, the institute's main building combines Greco-Roman and Colonial styles of architecture, with a plinth area of 2.5 hectares. The building was listed for a time, in the Guinness Book of Records, as the largest purely brick structure in the world. The institute has a developed infrastructure of all equipped laboratories, library, herbarium, arboreta, printing press and experimental field areas for conducting forestry research. It is 7 km from Clock Tower, on the Dehradun-Chakrata motorable road. It is the biggest forest-based training institute in India. Most of the forest officers are a part of this institute. The FRI's building also houses a Botanical Museum and there are

many different kinds of trees from around the world. Forest Research Institute (FRI), Dehra Dun made a humble beginning as Forest School established in 1878. Initially named as Imperial Forest Research Institute, FRI came into being in 1906. Later renamed as Forest Research Institute and Colleges, with a number of centres located at different places all over the country administering research as well as training of Forest Officers and Forest Rangers. After reorganization of Forestry Research in the country and creation of Indian Council of Forestry Research and Education (ICFRE) in 1988, the training and research centres were given an independent status of institutes. Forest Research Institute, now one of the institutes under ICFRE, was conferred the status of Deemed University in December 1991 on the recommendations of the UGC, Ministry of Human Resource Development, Government of India. The major events in timeline are the followings:

- 1864**-Ranger's College was set up in Dehradun
- 1878**-Founded as Forest School of Dehradun
- 1884**-The school was taken over by central government renamed Imperial Forest School
- 1906**-Reestablished as the Imperial Forest Research Institute (IFRI)
- 1922**-IFRI complex at Chandbagh, now it is Doon School
- 1923**-A large campus established at present position shifted from Chandbagh
- 1929**- Main building was inaugurated.
- 1988**-Creation of Indian Council of Forestry Research & Education (ICFRE)
- 1991**-Conferred the status of deemed university to FRI

Objectives of Fri

- To impart education in such branches of forestry and environment as it may deem fit.
- To provide for research and for the advancement of and dissemination of knowledge in the forestry and environment. The disciplines pursued in the Institute are Silviculture, Resource Survey and Management, Social forestry, Minor forest produce, Ecology and conversation, Genetics and tree propagation, Forest protection, Forest Botany, Forest products and Forest Operations. The thrust areas are bio-diversity, tree improvement & quality seed production, non-wood forest products, social forestry & wasteland afforestation, design development of modern forestry tools, etc.
- To create consciousness about forest and environment among the people through extension programs.
- To do all such other acts and things as may be necessary or desirable to further the safeguarding of environment and protection of forest & wildlife.

Location: FRI and College Area campus is a census town, between Kaulagarh in the north and the Indian Military Academy to the south. The Tons River forms its Western Boundary. It's about 6 kms from Clock Tower and the entry point (Trevor Road gate) is located right on the Chakrata Road itself.

Forest research institutes and related institutes

- Arid Forest Research Institute (AFRI), Jodhpur
- Forest Survey of India (FSI), Dehradun
- Indian Forest Service (IFS), New Delhi
- Indian Institute of Forest Management (IIFM), Bhopal
- Van Vigyan Kendra (VVK) or Forest Science Centers (Total no. 31)
- Tropical Forest Research Institute (TFRI), Jabalpur
- Himalayan Forest Research Institute (HFRI), Shimla
- Institute of Rain & Moist Deciduous Forests (IRMDF), Jorhat
- Institute of Forest Genetics and Tree Breeding (IFGTB), Coimbatore
- GBP Institute of Himalaya Environment & Development (GBPIHED), Almora

- Wildlife Institute of India (WII), Dehradun
- Kerala Forest Research Institute (KFRI), Peechi
- Institute of Wood Science and Technology (IWST), Bengaluru
- Indian Plywood Industries Research and Training Institute (IPIRTI), Bengaluru
- Advanced Research Centre for Bamboo & Rattan, Aizwal
- Centre for Forest based Livelihood and Extension (CFLE), Agartala
- Centre for Forestry Research and Human Resource Development, Chhindwara, M.P.
- Centre for Social Forestry & Eco-rehabilitation, Prayagraj
- Institute of Forest Biodiversity, Hyderabad
- Institute of Forest Productivity, Ranchi
- Indira Gandhi National Forest Academy, Dehradun
- Central Academy for State Forest Services (CASFOS), Dehradun
- Ministry of Environment and Forests (MOEF), New Delhi
- Uttarakhand Forest Research Institute (UKFRI), Haldwani



View of the main FRI building

In popular culture: More than a dozen movies *Dulhan Ek Raat Ki*, *Krishna Cottage*, *Rehnaa Hai Terre Dil Mein*, *404*, *Paan Singh Tomar*, *Nanban*, *Student of the Year*, *Student of the Year 2*, *Dilli Khabar*, *Yaara*, *Genius*, *Dear Daddy* and *Maharshi* were majorly shot in this campus. A television commercial ad of *Bournvita* was also shot here. Punjabi song *Pyaar tere naal he and Sajjan Raji* by *Satinder Sartaj* was also shot here. Web series like *Punch Beat* is also shot here. *Rash Behari Bose* worked here as a head clerk, before becoming a full-time participant in the Independence movement.

Museum of FRI

Silviculture Museum: -Sh. Siddhanta Das, Director General of Forests and Special Secretary, MOEF&CC, inaugurated the renovated Silviculture Museum Gallery of Forest Research Institute, Dehradun, in the presence of Dr. S. C. Gairola, Director General, ICFRE and Dr. Savita, Director, FRI on 17 December, 2018. The renovation and modernization work of the museum gallery has been funded by Ministry of Culture, Govt. of India. The Silviculture Museum Gallery of Forest Research Institute, Dehradun presents an overview of the Evolution of Forests, Forest Genesis and Growth, Threats to Forests, and various Dioramas depicting the Forests of Tropical & Temperate region, Silviculture Systems, Ecosystem Services and Sustainable Forest Management. It also showcases different samples of seeds, roots, barks etc. along with various models on Forestry working and operations. The Silviculture Museum Gallery showcases the evolution of forestry in India, importance of forests, threats to forests like Deforestation, Forest Fire, Shifting Cultivation, Invasive Plants, Adverse Climatic Factors, Insect Pests and Diseases, through creatively designed informative panels. It also highlights the accomplishments made in forestry along with the preparation & implementation of working plans for organized forest management.

Timber Museum: -The Timber Museum has exhibits of the best-known and most common commercial woods. One hundred and twenty six commercially important species displayed along the walls of the museum provide the visitors an idea on the characteristics of these woods. The lower halves of the planks have been left in the natural state, while the upper half are oiled with the linseed oil to enhance the features of the timber. Hanging above the planks are photographs of the trees whose planks are displayed along with small maps indicating their distribution in India. The transparent photomicrographs in a separate case show the structure of common Indian Woods as seen under a microscope. One cubic feet of green wood sample contains about 16 liters of water and it requires seasoning. After seasoning a significant amount of water (2.7 litres) still remains in the wood. If wood is not seasoned, defects like warping, cracking and twisting occur. A number of models representing different methods of air seasoning, steam seasoning and solar kiln seasoning are on display. Timber engineering techniques using short dimensional timbers for large span of trusses are depicted. Cabinet designing is demonstrated using different timbers and various patterns. The center of attraction, however, is a transverse section of a 704-year-old Deodar (*Cedrus deodara*) tree, which was felled in 1919 from the hills of U.P. The natural and climatic events can be clearly traced by reading the annual rings. Depiction of Indian history starting from the date of construction of Qutub Minar to Jalianwala Bagh incident made on this exhibit makes it very interesting. Another section displayed is that of a 330-year-old teak (*Tectona grandis*). Walnut and Padauk burr (outgrowths on the stem) specimens are also items of interest. Popular and inexpensive use of plywood, laminated wood, compregnated wood, bamboo boards and diaper are demonstrated and bamboo and wooden springs for furniture and other articles are displayed. Comparative mechanical properties of different timbers are depicted for various end uses. There is a gun carriage wheel made of rosewood, shisham, and Andaman Padauk.

Non-Wood Forest Products Museum: An exhibit of this museum shows a comparison between the conventional resin tapping technique and the newly developed rill method for resin tapping. Samples of turpentine oil and rosin, and a variety of species of bamboo found in our country make a unique collection. Exhibits also include samples of minor forest products such as katha, cutch, Lac products, essential oils, edible products, fatty oils, spices, drugs, tans, gums, etc. There are exhibits showing walking sticks, batons, sports goods, paper, matches, baskets, and products from grasses, leaves, flosses, etc.

Social Forestry Museum: This museum depicts the effect of environment with and without trees on productivity and economy of the villages. Photographs and Models show effect of tree growth on fuelwood, fodder and other forest products. Models show the nursery techniques for raising planting stocks, planting techniques and various protective measures for the plants. Models of improved smokeless chulhas to demonstrate the efficient use of fuelwood. Exhibits demonstrate the possibilities of establishing suitable cottage industries based on social forestry products and role of social forestry in providing employment, particularly to the landless people.

Pathology Museum: Forest Pathology Museum houses 900 exhibits of various economically important tree diseases and timber decays. Exhibits are arranged on the basis of two broad host groups: hardwood and conifers. These are further divided according to the part of the plant affected namely root disease, stem disease and foliage disease. Important tree diseases such as heart-rot in khair, sal, teak and deodar and root-rot in khair, Sal and pines have been displayed. Degradation of timber and timber products caused by micro-organisms are also displayed. Beneficial role of fungi as mycorrhiza to establish and promote tree growth especially in pines and the value of fungi as a source of food are also displayed.

Entomology Museum: This museum contains about 3,000 exhibits representing the various stages of insect pests and the nature of damage caused by them to seed, seedlings, standing trees, felled

timbers, bamboos and also finished products. Exhibits are arranged alphabetically according to plant genera. Important forestry pests like Sal heart-wood borer, teak defoliator, Meliaceae shoot borer, poplar defoliators, deodar defoliator, sissoo defoliator, babul stem and root borer, their biology, life history and nature of damage have been depicted along with methods to control them. Some of the insecticides and their application equipments are also exhibited. A depiction of the life history of termites and their control makes a very educative piece. Various commercial timbers have been graded according to their termite resistance property.

Historical Growth and Development: The present Forest Research Institute and Colleges are outgrowths of a Forest School for training rangers and foresters established at Dehra Dun in 1878 by the then local government, the Government of the North-West Provinces. This school was transferred to the Government of India in 1884 and named the Imperial Forest College. The first research post (property so called) to be created was that of Forest Entomologist in 1900. The Forest Research Institute as such came into being in 1906, as an adjunct to the Imperial Forest College and was historically the second of the central research institutes set up by the Government of India, the Indian Agricultural Research Institute having already been started in 1901. The Forest Research Institute started with the following branches: Silviculture, Economics, Botany, Entomology, and Chemistry. The Economics branch, together with the Chemistry branch, dealt with all aspects of forest products research, while the other branches were (and are) mainly concerned with the biological aspects of forestry. A considerable advance in the organization of the Economics branch was made in 1921-22, when it was expanded to include well-equipped sections of Timber Testing, Wood Working, Wood Preservation, Wood Seasoning, and Paper and Pulp, as well as the service units of Wood Workshops and Mechanical Engineer shops. A section of Wood Technology dealing with the anatomy and identification of Indian timbers was added later. A point of interest is that for 40 years prior to 1946 the heads of all the research branches have been forest officers drawn from the Indian Forest Service and from different provinces. The only exception is the Chemistry branch, which has always been in charge of a non-service officer. This fact - and the fact that nearly all Indian Forest Service Officers recruited since 1928, all officers of the Provincial Forest Services, and a predominant proportion of Forest Rangers throughout the country were trained at Dehra Dun - has helped to give the Forest Research Institute a position of prestige and importance in relation to the forest departments and forest services of India. It is generally regarded as the mecca of Indian forestry. The functions of the Forest Research Institute now extend only to India as constituted at the partition in 1947. Previous to that they had extended to what is now India and Pakistan; earlier still they had extended to Burma until that country separated from India in 1937, through Burma still continues to subscribe to and utilize the services of the Institute's research facilities.

FOREST RESEARCH

Silvicultural Research: -The Silviculture branch, which is one of the oldest in the Institute, deals with all aspects of silvicultural research, including forest management and forest mensuration. It maintains close relations with provincial silvicultural research officers, supplying them with technical assistance, co-ordinating the results of research, and acting as a clearing house for technical information from all over the world. The publications of this branch are numerous, the most outstanding being Troup's *Silviculture of Indian Trees* - a monumental work embodying the results of research at the Forest Research Institute and all over the country over an extended period. Champion's *Forest Types of India*, Champion and Trevor's *Manual of Indian Silviculture*, the *Statistical Manual*, and the *Experimental Manual*. The silvicultural techniques adopted throughout India are, to a large extent, based on research work done or directed, by the Silviculture branch. The program of silvicultural research is outlined by quinquennial Silvicultural Conferences held at the Institute, which are attended by provincial silviculturists and senior forest officers'

from the entire country. While tree and crop measurements are carried out by the branch in a large number of sample plots in the provinces, experimental studies relating to seed tests, nursery practice, phenology, exotic species, and effects of heredity are conducted in the Institute's own demonstration area and experimental plantations. The ledger files of the branch, which are carefully maintained, are a mine of information which has only been partially worked out. An important feature of the branch is its large photographic collection covering all aspects of Indian forestry. The photographs illustrating this article are from that collection. The Silvicultural branch includes an Ecology section and a Soil Science section.

Studies in Systematic Botany - The Herbarium: The Botany branch comprises the sections of Botany and Mycology. The Botany section is much the older of the two and has produced numerous publications, among which are *Flora of Bihar and Orissa*, the revised *Forest Flora of the Punjab*, the *Flora of the Anadamans*, the *Grasses of the United Provinces*, and Vol. V of the *Flora of Assam*, dealing with the *Graminae*. An excellent herbarium attached to this branch is now estimated to contain over a quarter-million leaves. It is especially rich in grasses and is recognized as among the best in the East. It includes 1,200 irreplaceable type or co-type specimens representing new genera and species. In it are incorporated collections dating back to 1816 and those of Royle, Falconer, Griffith, Helfer, Wight, Stocks, Dalzell, T. Thomson, and others. Among the more recent collections are those of Brandis, Lace, Gamble, Duthie, Haines, Parker, Parkinson, Bor, Stewart, Mooney, and Raizada. With the help of the herbarium, the Botany branch provides an authoritative technical service to forest officers and botanists in the correct identification of plants. The branch maintains a botanical garden, while the extensive grounds of the estate constitute a large arboretum which has been enriched by successive introductions of new plants.

Investigations in Tree and Crop Pathology: Although mycological work was started as early as 1911 systematic study of pathogenic fungi was not taken up intensively till 1927, when a Mycology section was formed with a fully qualified mycologist at its head. Investigations of rusts on *Pinus longifolia*, *Pinus excelsa*, deodar, spruce, and fir were undertaken, and their host-parasite relationship with stem and needle rusts has been established and remedial measures suggested. The fungal diseases of sal (*Shorea robusta*) have been studied and a great deal of work has been done on wood-rotting fungi in general. The Mycology section collaborates with the Wood Preservation section in toxicity tests on treated wood.

Insect Pests and Their Control - Insect Collection: The Forest Entomology branch ranks with the Silviculture branch as among the oldest research branches in the Institute. The first Forest Entomologist (then known as Forest Zoologist) was E. P. Stebbing (1906-1909), who is now Professor of Forestry in Edinburgh University. His book, *Indian Forest Insects*, was the first major contribution to forest entomology in India. He was followed in 1911 by A. D. Imms, who laid the foundations of the reference collection of insects, which is one of the finest in the East. It contains over 17,000 authentically identified species, carefully preserved, duly labelled, and entered in card indexes and in ledger files. Great advances were made during the long tenure of C. F. C. Beeson as Forest Entomologist, and control measures for numerous insect pests were evolved and prescribed. These include control of the top shoot borer (*Hypsipyla robusta*), the sal borer (*Hoplocerambyx spinicornis*), and the teak defoliators (*Hyblaea puera* and *Hapalia machaeralis*). Intensive work on the vector of the spike disease of sandal (*Santalum album*) has been done. The results of the accumulated research work of the branch were published in 1941 in Beeson's *Forest Insects*. The insect pests of felled bamboos and timber have also received considerable attention.

Forest products research: The foundations of timber research in India were laid by R. S. Pearson, who later became Director of the Forest Products Research Laboratory at Princes Risborough, England. Working with inadequate equipment and under difficult conditions, Pearson collected a mass of information regarding the preservative treatment, seasoning, and strength of Indian timbers. The large

Utilization branch which he built up and guided for many years has now been split up into Wood Technology, Wood Working and Timber Mechanics, Wood Preservation and Composite Wood, Wood Seasoning, Chemistry and Minor Forest Products, and Cellulose and Paper branches.



Wood products



Plywood

Utilization of Minor Forest Products: The Chemistry and Minor Forest Products branch carry on research in the utilization of all forest products other than timber. Out of a total flora of about 14,000 species in India, over 3,000 are in use: as sources of raw materials for various industries or for medicinal and other purposes. These products comprise essential oils, drugs, gums, mucilages, pectins, tans, oils, dyes, waxes, fibres, flosses, resins, etc. The field of work is enormous. The branch has played an active part in the establishment of the turpentine and rosin industry and in the production of santonin and ephedrine. More recent work has led to the production of a pectinaceous material from the seeds of *Tamarindus indica*, a waste product of the tamarind pulp industry. This is used as sizing in the textile industry in place of starch. A new source of natural camphor from a shrub has been discovered, and cultivation experiments are in progress.

Research Division and Discipline in the Institute

- **Genetics and Tree Improvement** (Genetics Improvement Plant Physiology, Tissue Culture, Breeding and Forest Biotechnology).
 - **Silviculture & Forest Management** (Experimental Silviculture, Forest Mensuration, Forest and Forest Biotechnology).
 - **Forest Informatics** (Forest Bio- Informatics & Forest Geo-Informatics).
- Programme**
- M.Sc. Forestry
 - M.Sc. Wood Science and Technology
 - M.Sc. Environment Management
 - M.Sc. Cellulose and Paper Technology
 - Doctoral Programme
- Important Workshops and Training**
1. The Extension Division of ICFRE-Forest Research Institute (ICFRE-FRI), Dehradun participated and installed an exhibition stall in Science & Technology Exhibition of 5th Dehradun International Science and Technology Festival - 2024 which organized by VMSB Uttarakhand Technical University during 20th to 23rd November, 2024 at Suddhowala, Chakrata Road, Dehradun (Uttarakhand).
 2. A five days short term training programme from 21st to 25th October 2024 for wood-based Industries from various parts of India related to the "Seasoning & Preservation of Wood & Bamboo" started at Forest Research Institute (FRI), Dehradun on 21st October, 2024. The training programme is being jointly organized by the Wood Seasoning & Wood Preservation Discipline of Forest Products Division, FRI, Dehradun.
 3. Extension Division, ICFRE-FRI, Dehradun organized an online seminar on 3rd October, 2024 as a part of celebration of Wildlife week-2024. On this occasion an online lecture was delivered on "Human wildlife conflict: Issues, challenges and way forward" by Dr. Bilal Habib, Sr. Scientist, Wildlife Institute of India (WII), Dehradun.
 4. ICFRE-Forest Research Institute (FRI), Dehradun celebrated Himalaya Day, with a special guest lecture on this Day 9th Sept 2024. The special guest lecture was delivered by Dr. S.S. Samant, Former Director, Himalayan Forest Research Institute (HFRI), Shimla on the topic "Need for the Conservation and Management of Himalayan Ecosystem".
 5. Extension Division of ICFRE-Forest Research Institute, Dehradun organized Van Mahotsav 2024 with a tree planting event at the Rashtriya Indian Military College (RIMC) in Dehradun as part of the "Ek Ped Maa ke Naam" campaign on 24th July 2024.
 6. Extension Division of ICFRE-Forest Research Institute, Dehradun organized the celebration of International Day of Yoga-2024 on the theme "Yoga for self and society" on 21st June, 2024 and organized Yoga session for all the staff of ICFRE-Forest Research Institute, Dehradun. The Forest Tree Seed Laboratory, Silviculture and Forest Management Division, ICFRE Forest Research Institute, organized a one-day training programme on "Quality Seed Production and Nursery Technology" for frontline staff of the Seed and Research Ranges of Uttarakhand FD at the Uttarakhand Forest Research Institute, Haldwani, on 14th June 2024.
 7. ICFRE-Forest Research Institute, Dehradun celebrated World Environment Day-2024 on the theme "Land Restoration, Desertification, and Drought Resilience" on 5th June, 2024 and organized Kavita Paath, Poster making competition for students and staff of ICFRE-FRI and Forest Ecology and Climate Change Division organized quiz competition and Genetics and Tree Improvement Division also organized a Presentation competition on "My ideas to fight with desertification and drought.
- **Botany** (Systematic Botany, Wood Anatomy).
 - **Chemistry & Bio-Prospeting** (Chemical Extracts from Trees, Forest based Oilseeds, Medicals and Aromatic Plants, Resins and Gums).
 - **Extension** (Social Forestry and Extension, Agroforestry).
 - **Forest Ecology & Climate Change** (Forest Productivity, Biodiversity, Environment and Pollution Wasteland, Reclamation, Soil Geology and Mineralogy, Climate Change & Forest Influence).
 - **Forest Protection** (Forest Diseases Forestry Bio-fertilizers Control Measure and Taxonomy).
 - **Forest Products** (Timber Mechanics, Wood Seasoning, Wood Preservation, Composite Wood, Wood Working and Finishing, Timber Engineering Cellulose & Paper Technology).

8. Forest Research Institute organized a seminar on very important topic 'Role of Women in Conservation of Environment' on 20th March 2024. More than a hundred women scientists, officers, technical officers and women employees from various institutions located in the New Forest campus participated in the program. The chief guest of the function was Smt. Kusum Kandwal, Chairperson, Uttarakhand State Commission for Women. Dr. Manisha Thapliyal, Scientist-G of the institute, welcomed the gathering and discussed the importance of the topic 'Role of women in environmental conservation'

ADMISSION PROCEDURE

Master Programme: The Forest Research Institute shall admit the students to the M.Sc. courses, through entrance examination.

System of admission: An advertisement will be made in national newspapers inviting applications for admission to the programmes to be conducted by the Institute. The number of seats fixed and advertised will not be generally changed.

Reservation for scheduled castes / tribes, OBC: -15 percent of the total available seats shall be reserved for scheduled castes and 7.5 percent for scheduled tribes' candidate subject to their being otherwise suitable. The reservation to OBC is being provided as per the policy of the Govt. of India.

Eligibility: The qualifications of M.Sc. programmes, Post Masters Diploma and Post-graduate courses fixed by the Academic Council are as follows: -

1. **M.Sc FORESTRY:** Bachelor's degree in science with at least one of the subjects namely Botany, Chemistry, Geology, Mathematics, Physics and Zoology or a Bachelor's degree in Agriculture or Forestry.
2. **M.Sc WOOD SCIENCE & TECHNOLOGY:** Bachelor's degree with Physics, Mathematics and Chemistry or B.Sc. degree in Forestry.
3. **M.Sc ENVIRONMENT MANAGEMENT:** Three years Bachelor's degree in any branch of basic or applied Sciences or Bachelor's degree in Forestry or Agriculture or BE in Environment Science.
4. **M.Sc. CELLULOSE & PAPER TECHNOLOGY:** Three years Bachelors' Degree in Science with Chemistry as one of the subject, BE/ B.Tech. (Chemical or Mechanical Engineering).

Procedure for application

- i. Application for admission shall be made on the prescribed form obtainable from the Registrar, Forest Research Institute, Dehra Dun. The application form and the Information Bulletin can be had either in person or by post on payment of Rs.1500/- through Bank Draft in favour of Registrar Forest Research Institute University payable at Dehra Dun. The cost of the form mentioned above is subject to review and change from time to time.
- ii. Application duly filled in legibly and correctly in applicant's own handwriting should be sent with accompanying set of documents completed in all respect so as to reach the Registrar, Forest Research Institute University P.O I.P.E. Kaulagarh, Dehra Dun on or before the last date. Postal delay will not be accepted as plea to entertain application after the last date.
- iii. The candidate must in his/her own interest fill up the application form most carefully and ensure that all certificates required are attached. All enclosures must be page numbered.
- viii. Scheduled Caste/Tribe/OBC certificate from District magistrate or authorities empowered to issue certificate of verification issued not more than six months before the date of application.

- ix. Character certificate issued by Principal/Head of the Department/ Dean/Registrar of the College/Institute/ University last attended.
- x. One recent passport size photograph to be affixed in the space provided in the application form and two others for office record. Production of original certificates and mark sheets at the time of admission is an essential requirement, which is not relax-able in any case under any circumstance.

Eligibility for the written test

- a. Candidate to be called for the written test shall have a minimum qualification prescribed for the purpose for the various courses.
- b. There will be a written test for admission to M.Sc. Courses and Post Master Diploma Course on the following subjects:
 1. Basic Sciences including Social Science
 2. Arithmetic and Quantitative abilities, Computational ability, Quantitative reasoning, Interpretation of Tables, Graphs, etc.
 3. General Knowledge and Current Affairs
 4. English Language, Comprehension, Vocabulary, Grammar, Idioms, etc.

The total marks of Entrance Examination shall be decided by the Director from time to time and shall be notified in the Information Bulletin to be given to candidates along with the admission forms. A sample of question should be included in the Information Bulletin.

Announcement of results and admission

- a. The final list of candidates to be admitted to different courses on the basis of the seats allotted to each course shall be approved by the Admission Committee constituted by the Director for each course and the results will be notified thereafter. The notification shall be displayed on the Notice Board of the FRI (Deemed) University and the individual candidates would be informed of their results by post.
- b. The notification announcing the names of the selected candidates for each course.
- c. Candidates called for admission have to produce before the secretary of the Admission Committee of each course concerned original certificates, mark sheets etc. before the payment of fees. However, in cases where the original marks sheets indicates clearly that the candidate has passed the qualifying examination prescribed for admission he/she be admitted on the condition that he/she shall produce the original degree/provisional degree within one month failing which his/her admission is liable to be cancelled. The admission on the basis of attested mark sheet/degree shall not be given in any case. There can be no appeal to any authority if the candidate fails to produce the original documents at the time of admission.

Training Facility: Within its campus, it hosts Indira Gandhi National Forest Academy (IGNFA), which is a separate organization of the Indian Ministry of Environment and Forests (MOEF). It also hosts the Central Academy for State Forest Services (CASFOS). The Wildlife Institute of India was on campus but now has moved to Chandrabani, and is an independent organization under MoEF. IIFM is an independent autonomous organization of MoEF and has good liaisons with FRI for forestry research and related activities. Presently IIM Kashipur, Uttarakhand running its executive management course on weekends for working person in this campus. The deemed university of FRI runs four MSc courses viz. Cellulose & Paper Technology, Environment Management, Forestry Management, Wood Science Technology and two P.G.Diploma courses in Natural Resource Management and Aroma Technology. It also enrolls a large number of research scholars every year for Ph.D.

Major Considerations: The major considerations are the followings: -
(a) Make the name Forest Research Institute (FRI) to Indian Forest

Research Institute (IFRI) or Central Forest Research Institute (CFRI) or National Forest Research Institute (NFRI) to enhance importance and to easy understanding that it is a national institute. (b) Main activity of this institute will be to enhance or expand forest area of country day by day. (c) Second most important activity will be to protect the forest from insect-pests, diseases, natural calamities, poaching etc. (d) The third most important activity is to conserve the forest on a sustainable basis because it is the base of human life and animal life. (e) FRI, Dehradun, a major tourist attraction. So provides tourists seedlings, seed at minimum cost and encourage tourists to plant a tree in their areas by video showing the importance of tree or forest in individual life and a nation life. (f) Main research will be how to cover whole India with green or minimum 1/3 area of country. How to plant in desert areas, coastal areas, hilly areas and other fallow lands. (g) Forest officers who are taking training at FRI or to whom training is provided, after completion of training programme, he or she by his or her own efforts or their collective efforts each one must plant 500 seedlings in forest areas, after that they will get their training certificates. (h) Forest officers, forest rangers' responsibility will be how to protect forest, how to expand forest area. Soldiers protect our country, similarly forest soldiers mean this forest personnel must protect our country's forest at their level best, because their importance similar to soldiers of our country. Without protection a country is not safe and without forest a country cannot survive. (g) According to international law, each country must have 33.33% green cover, but our country has only 21.76 % forest area (year 2025 data). Hence, FRI must try to remove the gap and will make our country a green country or environmentally healthy country. (i) Central govt. must instruct to state govt. to cover the state's 33.33% area with forest. (j) Contribution of forest economy to national economy will be enhanced gradually. (k) Role of ICFRE will be more encouraging. (l) A national holiday is needed as National Forest Day. In this day every citizen of our country must plant a tree seedling with rituals and celebrate it as joy of life. Whole country in that day will go in celebration mood.

Day by day it will be made a culture of our country. Need to develop such type of new culture in our country. It is the need of the hour. (m) Centering a small forest, the future cities will be developed and the present cities where it is possible, it must be implemented. (n) Introduction of oxygen tax for your smooth breathing (Rs. 50 per year per individual) is very necessary to push population to realize the importance of tree or forest in life or in country. (o) Dropping of seedball from helicopter on non-cultivable land before monsoon a very good option for green covering. (p) Any individual person, personnel, or forest personnel who having significant contribution in forest expansion or forest protection or forest conservation will be nominated for Bharat Ratna award. (q) To protect the forest from the poachers, sufficient numbers of Royal Bengal Tigers & leopards must be released to every forest's core area. (r) Sufficient number of forest pond should be dug out to store rain water and bit the hot summer season. As a result, forest animal will get drinking water, plants surrounding pond will survive in a better way. Pond based ecology is one of the best ecologies. (s) Importance of forest expansion, protection and conservation must reflect in the speech of Prime Minister in every Independence Day from Red Fort along with his other speeches. (t) Without permission from appropriate authority(s) to cut a plant/tree of age above 10 years on public land will be considered as murder case and its highest punishment will be six years jail without fail. (u) Human being's best friend is plant, because, without plant human cannot survive, civilization cannot sustain, that education must be injected to students from primary level of education onwards. (v) Destroyed forest part or forest gap must be covered by planting fruit trees if possible. One way fruit tree cover the forest & other way provide fruits that will be food of forest animals. Forest animals need fruit, due to food scarcity in forest, from forest, animals come out and approach locality for food only.

(w) If forest area expands, then it is possible to develop a forest products-based economy. (x) To save the forest from poaching, each national forest's core area must be no human entry zone. If anyone enters except forest personnel shoot at site order must be implemented strictly. (y) Criminals' (jailbirds) one important task will be to transplant seedlings of forest trees in forest area for removing forest area gap or expansion of forest area. (z) The registered NGOs, those are helping in forest expansion, will get fund from Central government. (a1) FRI's main research area, must include research on -1. How to transplant tree on desert areas 2. Coastal areas 3. Riverside 4. Hilly areas. For green covering of desert area date palm and locally grown cactuses are most suitable. (b2) To get a job in forest department, is not only a way of survival, but it is a matter of prestige and responsibility, how to make green India and accelerate country's progress. What a way, a doctor having responsibility, soldier having a responsibility, farmer having responsibility, similar way of responsibility is there. (c2) Forest development will be done mainly on non-agricultural land. But, how to expand forest area on agricultural land that is also a matter of intelligence. In this respect, agro-silviculture, multi-layer cropping are rays of hope. (d2) Integrated planning for forest tree planting will be done in a such way that citizen himself will be motivated to plant a tree. That day the FRI's ultimate objective to make India green will be successful. (e2) Tree plantation is not a option but compulsion. If you plant a tree, it expresses your love to your own country and it will make you a patriotic.

CONCLUSION

ICFRE is primarily engaged in forestry research, extension and education. As forest management in India relates largely to Government owned forest land and its users, work has to cater to Forest Department and the communities who benefit from forest resources. With the efforts of this organization, various technologies have been developed for expanding the tree cover on forest and private lands in India. Several consideration points are indicated here for forest expansion, protection and conservation, FRI will select right ones. But FRI will act such a way that country's forest expansion, protection and conservation will get strong hold. Many years before FRI established, though why country having lack of required forest area. A country must have one-third area forest area, then the country is a green country, environmentally healthy country and sustainable country. Considering the considerations among those are appropriate, FRI will reorient its working infrastructure properly. In respect of forest, Wangari Maathai told- "The future of planet concerns all of us, and all of us should do what we can do to protect it. As I told foresters and the women, you don't need a diploma to plant a tree" and Franklin D. Roosevelt told- "Forests are the lungs of our land, purifying the air and giving fresh strength to our people."

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