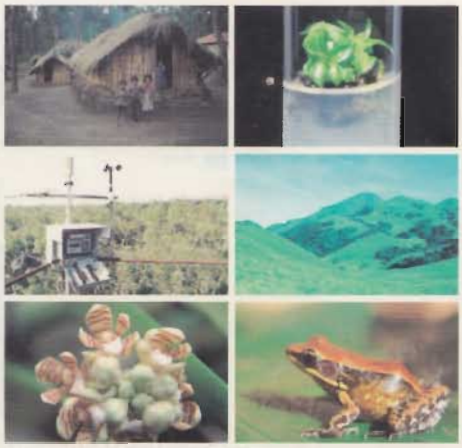
KFRI

IN THE SERVICE OF FORESTRY ENVIRONMENT AND PEOPLE



SILVER JUBILEE YEAR

kfri

1999 - 2009

KERALA FOREST RESEARCH INSTITUTE

ABOUT THIS PUBLICATION

Brought out in the Silver Jubilee Year, this publication attempts to highlight some of the most significant contributions of the Kerala Forest Research Institute (KFRI) in the service of forestry, people and environment.

The information presented in this publication is drawn from a number of published research and consultancy reports, brochures and several extension activities undertaken by KFRI scientists over the years. The readers interested in knowing more about the research and extension activities of the Institute are welcome to contact the Director and interact with the scientists.

Published by

The Director
Kerala Forest Research Institute
Peechi 680653
Thrissur District, Kerala, India
Tel: +91-487-282037, 282061, 282062, 282063, 282365 Fax: +91-487-282249
E-mail: libkfri@md2.vsnl.net.in
Website: www.kfri.org

CONTENTS

Design Fingraph. *Printed at* St. Joseph's Press Trivandrum 14

OUR MANDATE

KFRI'S GOALS

Provide technical support to facilitate scientific management and utilization of forests and wildlife for social and environmental benefit.

Contribute to our understanding of the natural processes and patterns in the functioning of the forest ecosystem and their inter relationships in improving the quality of our environment.

Provide information and advice to industries and general public on forest related subjects.

The Kerala Forest Research Institute (KFRI) was established by the Government of Kerala on 3 July 1975 as an autonomous Institute registered under the Travancore-Cochin Literary, Scientific and Charitable Societies Act 1955. It functions under the umbrella of Science, Technology and Environment Department of the State. KFRI's mandate is to carry out research and developmental activities in areas relevant to forestry. KFRI also functions as a research and advisory wing of the Kerala Forest Department (KFD).

The goals of the Institute are fulfilled by conducting well-planned and time-bound research either on carefully selected thrust areas of tropical forestry or on problems identified by the user agencies which include the Kerala Forest Department, forestry organisations in the corporate sector, private industries, and several other forest-based organizations in India and abroad.

AREAS OF RESEARCH ACTIVITIES

- Plantation forestry
- Management of natural forests
- Wildlife biology and management
- Wood science and timber utilization
- Socio-economic research

The Institute maintains close liaison with the State Forest Department, wood-based industries, public and other institutions related to forestry. It is because of KFRI's commitment to applied research, every year KFRI is approached by various agencies for solving forestry related problems.

Over the past 24 years KFRI has acquired expertise and built up necessary infrastructure facilities to undertake problem-solving academic and applied research for meeting the needs of the forestry sector of the State. At present there are 51 scientists engaged in active research programmes, with 40 of them possessing doctoral degree in specialized areas. Most of the scientists are with extensive research background in India and abroad and they also possess expertise in handling multidisciplinary projects. In addition to the scientific personnel, there are about a hundred supporting staff.

RESEARCH SUPPORT AND SERVICES TO FORESTRY

The Institute is tied up directly to the needs of the Kerala Forest Department (KFD). The close collaboration of KFRI with KFD is ensured by several administrative links established between the two organisations. The Kerala State Minister for Forests is the Chairman of KFRI's Governing Body and the Principal Chief Conservator of Forests is a member of its Executive Committee and Chairman of the Research Advisory Committee (RAC) which decides on the priority and direction of research in KFRI. Besides, all Chief Conservators and Conservators are also statutory members of the RAC. The RAC has played an important role in linking the research programme of the Institute to the needs of the Forest Department. Close links with the KFD are also maintained through KFRI-KFD interaction meetings which have provided opportunities for discussion on problems faced by the scientists in their field studies and also free exchange of ideas. A healthy and mutually beneficial interaction between KFD and KFRI has resulted in providing a scientific basis for management decisions and actions by KFD and refining approach and capability of KFRI scientists to address problems of practical relevance. The Institute organises workshops/training programmes for the benefit of the personnel from KFD, other State Forest Departments and forest based industries. There are a number of other user organisations which receive services from KFRI. The research activities of KFRI which are of direct relevance to forestry sector can be grouped under the following heads:

- Productivity improvement of plantations
- Management of natural forests
- Wildlife research
- Wood utilisation
- Other services.

User/Sponsor Organisations

Kerala Forest Department

Kerala Forest Development Corporation

Plantation Corporation of Kerala

Kerala State Planning Board

Ministry of Environment and Forests, Government of India (GOI)

Ministry of Textiles, GOI

Department of Biotechnology, GOI

Department of Science and Technology, GOI

Ford Foundation, USA

IDRC, Canada

ACIAR, Australia

AusAID, Australia

Alexander von Humboldt Foundation, Germany

Department for International Development, UK

INBAR, China

UNDP, New Delhi

ICAR, New Delhi

McArthur Foundation, USA

NRI, UK

CIFOR, Indonesia

FAO, Italy

FORSPA, Bangkok

Hindustan Newsprint Limited, Kottayam

Grasim Industries Ltd.

Sterling Tree Magnum

STEC, Kerala

PRODUCTIVITY IMPROVEMENT OF PLANTATIONS

TEAK

Teak (*Tectona grandis* L. f.) is the major plantation forestry tree species in the State, with more than 75,000 ha. of area under plantation. Teak is highly valued for its quality timber which is in great demand both within India and abroad. Some of the specific achievements of direct relevance to management of teak cultivation are highlighted.

Findings and Recommendations

- Slash burning for site preparation shown to have no special advantages.
- Taungya system shown to cause damage.
- Use of teak seeds above 9 mm diameter shown to be important for nursery establishment.
- Economic loss due to insect defoliation demonstrated.
- Fertilizer dose recommendation for young teak plantations.
- Advantages of faster grown teak timber for heartwood yield, weight and strength demonstrated.
- Recommendation for conversion of teak plantations in steep slopes to natural forests.
- Fourth Quality teak plantations recommended to be managed for pole production under coppice system.
- Recommendation to avoid planting on river banks to manage water blisters.

Research Output of Applied Value

- A design for layout of seed orchards.
- Three pilot scale seed orchards for production of improved seeds.
- Selection of 750 ha of teak seed stands.
- Termite aided seed processing for improved seed germination.
- Method for estimation of plantable stumps in nursery beds.
- A biological control method for the teak defoliator.
- Control measures for the teak sapling borer and the trunk borer.
- An optimum thinning schedule for teak based on computer simulation models.
- Estimation of the current productivity levels of teak plantations in Kerala.

High input management

Teak defoliator

Conolly plantation - world's oldest

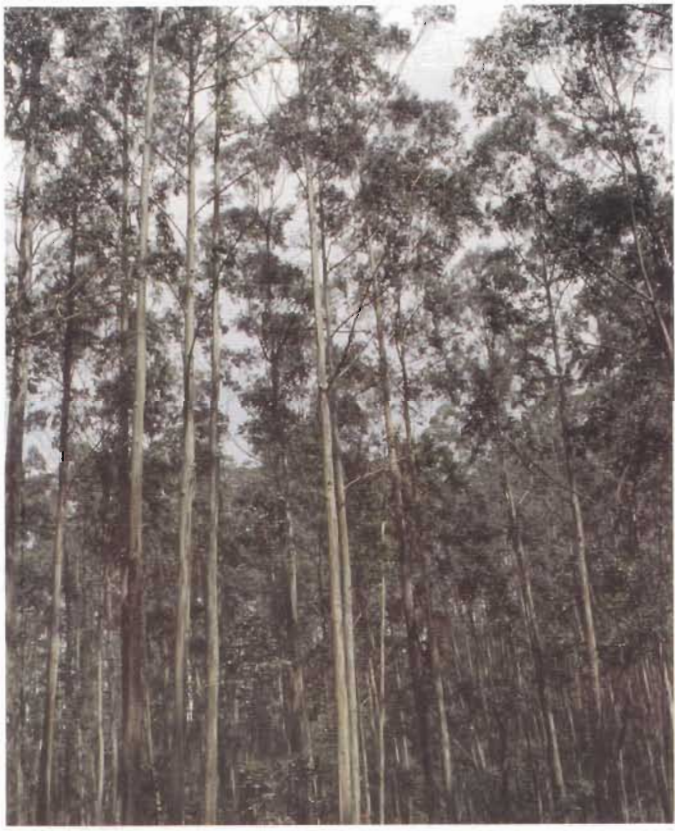
PRODUCTIVITY IMPROVEMENT OF PLANTATIONS

EUCALYPTS

Kerala has nearly 40,000 ha of plantations under two eucalypt species, namely, *Eucalyptus grandis* and *E. tereticornis*. Poor growth, pests and diseases are the major factors for the low productivity of plantations in Kerala. Besides, there has been immense pressure from environmental groups against the expansion of eucalypt plantations. KFRI has provided strong scientific support to overcome these problems through a number of research programmes.

Research Applications

- Prophylactic disease control measures worked out for nurseries.
- Prophylactic termite control measures standardised for plantations.
- Disease resistant and fast-growing provenances of different species identified.
- Disease resistant and fast-growing clones developed and planting mterials supplied to KFD.
- Developed an economical field clonal propagation unit for clonal multiplication.
- Need for wider spacing (3 m x 3 m) in eucalypt plantations recommended for reduced water consumption without affecting productivity.
- *E.urophylla* identified as a water use efficient species for Kerala.
- Standardised fertiliser dosage for optimum growth.
- Reasons for low productivity of eucalypts in Kerala analysed and recommendations given for increasing productivity.
- Seed rates for nurseries of *E. grandis and tereticornis*.
- Stump planting method for *E. tereticornis*.



Root trainer technology

Low cost mist chamber

PRODUCTIVITY IMPROVEMENT OF PLANTATIONS

Bamboo in flower

Dendrocalamus giganteus

Rattan plantlet

BAMBOO AND RATTAN

Bamboo and rattan are traditionally important raw materials in the cottage industry sector of Kerala. Bamboo is extracted from both natural forests and plantations. The major handicaps for raising bamboo in plantations include seed scarcity (because most bamboo species flower once in a life-time) and low seed viability and, hence, dearth of planting material. Research in KFRI has improved this situation.

Rattan, found in natural forests, is threatened by over-extraction. Hence, attempts are being made by KFD for rehabilitating rattan in natural forests and also raising it in plantations. Strong research support is being given by KFRI in this task.

Research Outputs of Applied Value

- Storage techniques developed for increasing the shelf-life of bamboo seeds.
- Vegetative propagation methods standardised for several species of bamboo.
- Micropropagation methods standardised for several species of rattan and bamboo.
- Establishment of a germplasm collection of 40 species of bamboo.
- Fertiliser dosage for bamboo plantations recommended.
- Control measures developed for bamboo nursery diseases.
- Economics and ecology of using bamboo in a multitier crop system in homesteads worked out.
- Homesteads in Kerala produce more bamboo than the forests as shown by a detailed survey.
- Technology developed for raising rattan plantations.
- Seed stands of rattan established.
- Nursery technology for raising seedlings of different rattan species.
- Germplasm of 30 species of canes has been established.
- Morphological and anatomical key for identification of rattan.

PRODUCTIVITY IMPROVEMENT OF PLANTATIONS

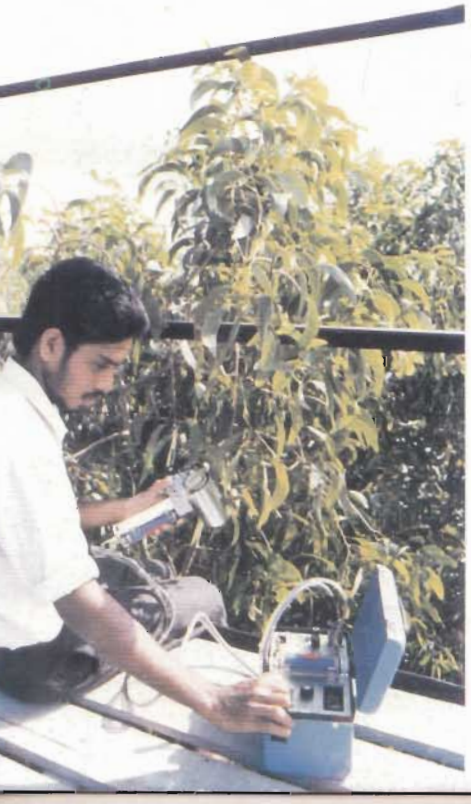
OTHER SPECIES

Research on several other indigenous and exotic species have been carried out in KFRI. Some of the species studied include *Acacia*, *Ailanthus*, *Anacardium*, *Bombax*, *Dalbergia*, *Gmelina*, *Grewia*, *Pterocarpus*, *Sweitenia*, *Terminalia*, *Xylia*, etc. Studies were undertaken for species selection, development of propagation and nursery techniques and on eco-physiology.

Application of Research Results

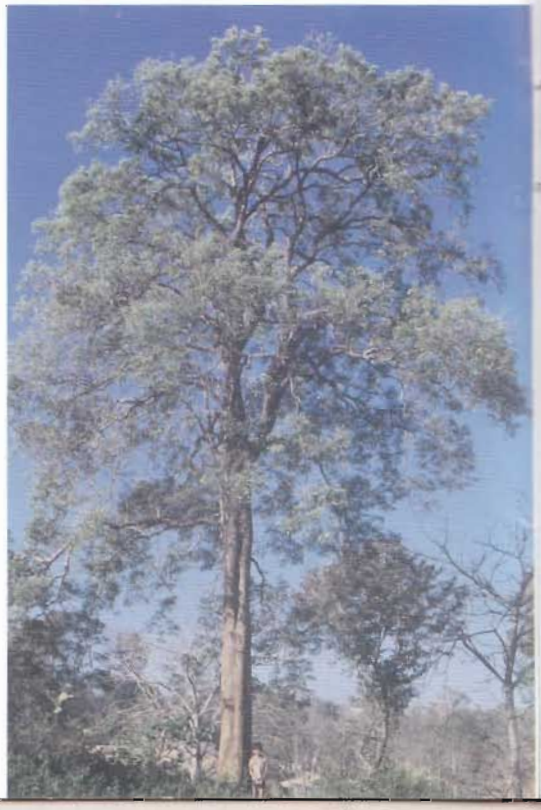
- Nursery techniques standardised for several species.
- Plantation trials conducted for several indigenous timber species and growth details gathered.
- Species and techniques identified for dryland afforestation.
- Species identified for Wyanad grassland afforestation.
- Volume tables developed for *Acacia auriculiformis*.
- Prediction equations developed to estimate wood volume from stump measurements.
- Prediction models developed for estimating tree volumes and biomass.
- Water use characteristics of several species estimated.
- Methods standardised for controlling several pest and disease problems.

Transpiration measurements in Acacia



Candidate plus tree - Ailanthus triphysa

Rosewood tree



MANAGEMENT OF NATURAL FORESTS

The natural forest cover of Kerala is estimated to be 4,900 km^2 which is 12.6 % of the land area. Ecologically, these forests are very varied with areas under moist deciduous forests, wet evergreen forests, semi-evergreen forests, tropical scrub forests, tropical montane forests, tropical montane grasslands, etc. This wide variety of ecosystem has given rise to a rich biodiversity in these forests. No wonder most of KFRI's research efforts have gone into identifying and enumerating the rich bio-diversity. A number of regional floristic and faunistic studies have been conducted which have helped the forest managers and the public to realise the importance of biodiversity. KFRI has so far reported sixty five species of new taxa from the natural forests of Kerala. This includes thirty one species of flowering plants, two fishes, five insects and twenty seven fungal species.

Findings and Applications

- Inventorying the biodiversity of several Reserves/ Protected Areas.
- Vegetation maps prepared for several Protected Areas.
- An ecotaxonomic key developed for identification of plants based on vegetative characters.
- Identification key developed for important forest tree seedlings.
- Deleterious effects of selection felling on regeneration highlighted.
- Estimation of heart-rot in standing trees.
- A Manual of medicinal plants of Kerala prepared.
- A Manual of non-wood forest products (NWFP) of Kerala prepared.
- A participatory management action plan suggested for sustainable management of NWFPs in Kerala.
- A Handbook on forest trees of Kerala including exotics prepared.
- Planting material of medicinal plants, bamboos and canes assembled and supplied to Forest Department.
- Plant/tree identification service rendered with the help of a well-equipped herbarium.

Cymbidium aloifolium

Rauvolfia serpentina

WILDLIFE RESEARCH

KFRI has devoted considerable attention to research in protected areas (PA), that include 12 Wildlife Sanctuaries and two National Parks. KFRI and KFD joined together to estimate the wildlife population in the forests of Kerala with the active participation of the public. Much effort has also been spent on studying the man-wildlife conflict in different parts of the state. New information on reptiles, amphibians and fishes in PAs along with details on microhabitat have been generated. These studies are expected to help KFD in taking better management decisions in protecting the wildlife sanctuaries.

Research Output

- Methods standardised for wildlife census.
- Methods developed and handbook published for identification of wild animals from indirect evidences.
- Collected information on animal biodiversity to assist PA management.
- Project Elephant Management Plan prepared.
- Interaction studies in protected areas to help reduce man-wildlife conflicts.
- Co-ordinated wildlife census in 1993 and 1997 with active public participation.
- Population estimation of endangered animals and recommendations for protection.
- Standardised the technique for animal identification from hair structure.
- Developed a referral museum with specimens of fishes, amphibians and reptiles.

Lion-tailed macaque

Slender loris

Rhacophorus lateralis

WOOD UTILISATION

Innovations and improvement in wood utilisation have been one of the areas of research priority at KFRI. The Institute is fully equipped and competent to provide a wealth of information on the identification, properties and potential uses of wood.

Research Results of Applied Value

- Compiled information on Kerala timbers in a handbook.
- Wood identification keys developed and timber identification services rendered.
- Standardised preservative treatments for rubber wood and promotion of its commercial utilisation as timber.
- Assessed the supply and demand of timber.
- Method developed to expand the storage life of reed bamboo.
- Volume weight relationship of eucalypt wood established for commercial use.
- Methods for preservative treatment of canes developed.

Conventional teak timber

Fast - grown teak timber

Cured rattan in use

OTHER SERVICES

KFRI is a storehouse of knowledge on various aspects of forestry which is easily accessible to all interested in forestry in the State. A variety of information required by the forest managers are readily available in KFRI which have often been drawn upon by KFD and many other organisations for preparation of management plans or solving practical forestry problems.

Services Rendered

- Support to KFD and Courts of Kerala in litigation dealing with forests, timber and wildlife.
- Provided basic training to KFD staff in the use of computers.
- Important inputs in the analysis of data provided by KFD on SC & ST settlements within forest areas.
- Advice on statistical designs, methods and different applications.
- Regular extension services to KFD in the investigation of pest and disease problems.
- Supply of propagules of bamboos, reeds, rattan, medicinal plants, etc. to KFD, Tamilnadu and Andhra Forest Departments for raising trial plantations.
- Provided technical inputs for the erection of a veneer band dryer at the Kerala State Wood Industries Ltd., Nilambur.
- Technical inputs for processing of rubber wood and cane at Forest Industries (Travancore) Ltd., Alwaye.
- Scientists served as resource persons in nature education programmes conducted by KFD in Protected Areas.
- Establishment of a Teak Museum at Nilambur.
- Providing scientific support to KFD for establishment of automated weather stations in Wildlife Sanctuaries and National Parks.
- Provided training to staff of KFD, KFDC and PCKL on various forestry topics.
- Identification of animals and certification for wildlife offences.
- Improving storage yard facilities of HNL to minimise biodeterioration of raw material.

Teak Museum - NilamburS

RESEARCH OF ENVIRONMENTAL RELEVANCE

Kerala is comparatively less industrialised when compared to many other Indian States. This does not mean that there are no threats to the environment. Many threats are posed to the environment due to the construction of dams, developmental activities due to urbanization, soil erosion, use of pesticides and fertilisers in forest ecosystem, etc. These and many other problems have been tackled by KFRI and appropriate recommendations given to various agencies.

Major Services Rendered

- Environmental impact assessment for construction of dams, tourism promotion in forest areas, establishment of roads and other constructions.
- Establishment of greenbelt around industrial sites using suitable tree species.
- Impact on the water table caused by exotic and indigenous tree species.
- Biological control of pests and diseases instead of using chemical insecticides and fungicides.
- Mycorrhizal inoculation to enhance establishment and growth of seedlings in plantations instead of using chemical fertilisers.
- Soil erosion studies in plantations of teak and eucalypts.
- Plantation trials of bamboo to prevent soil erosion in hill slopes, river banks, etc.
- Environmental impact assessment for Greater Cochin Area.

Green belt at CRL

Automated weather data acquisition

SERVICES TO THE PEOPLE

RESEARCH OF SOCIAL RELEVANCE

It is because of the Institute's commitment to applied research, every year KFRI is approached by various agencies for solving some of the forestry based problems. KFRI scientists are willing and committed to meet the people's needs. Problems posed by private/ government organisations are tackled either through undertaking sponsored research projects where the new information need to be generated or through consultancies, when the knowledge is already available. Services to the people aregiven mainly in the following broad areas:

- Solve forestry related problems confronted by the people and forestry based industries.
- Impart training to technical personnel, scientists, farmers, artisans and university teachers/ students through specialised training programmes, lectures, demonstrations and workshops.
- Educate people on various forestry related topics through extension activities such as exhibitions, lectures, radio talk, visits to the Institute by nature clubs.

Technical advice to private nurseries

Socially Relevant Research

- **Durable bamboo poles**

  A preservation technique has been standardised at KFRI which increases the service life of bamboo poles used as props for agricultural purposes two to three times that of normal poles. This will help the farmers save extra expenditure for the successive crops.

- **Wood preservation**

  Some of the wood preservation methods developed in KFRI are very cost effective and hence affordable to the general public.

- **Better canes and reeds**

  Methods have been standardised at KFRI for controlling biodeterioration of reed bamboo, an important raw material for pulp. An improved oil curing process of canes has also been standardised and a curing unit setup at KFRI Subcentreat Nilambur for demonstration purpose.

- **Termite control**

  A method for controlling the subterranean termites which damage the wood work in new and existing buildings has been standardised.

- **Medicinal plants**

  Detailed information on medicinal plants of Kerala forests have been compiled in a handbook with its habitat, properties and uses. The document is of practical use to traders, students of Ayurveda, physicians, foresters and others dealing with medicinal plants in Kerala. To facilitate authentic identification, a total of 300 species of medicinal plants are maintained as a reference collection in the medicinal plants garden of the Institute.

- **Timber Identification Service**

  To facilitate easy and correct identification of wood, a Xylarium (collection of wood specimens) has been established in the Institute. At present, there are 567 collections in the Xylarium, of which 113 are of Kerala timbers. The Institute also provides services for identifying timbers including imported ones for a nominal fee. Detailed information pertaining to timbers of Kerala has been compiled in 'A handbook of Kerala timbers' to provide ready source of information on the well known, as well as the lesser known woody species of Kerala. This publication is equally useful to foresters, traders, processors, farmers and all prospective users.

- **Planting materials of bamboo**

  Propagation of bamboos employing seeds is not practical for many species. To overcome this problem a method of vegetative propagation of bamboos using culm cuttings has been standardised for 12 bamboo species of economic importance.

- **Checklist of forest trees**

  It is estimated that there are about 3500 species of flowering plants in the Kerala forests. Of these, around 600 are classified as trees. A handbook on the checklist of forest trees of Kerala provides a complete index of the trees in Kerala forests. Information on indigenous and introduced trees including exotics are available in the checklist.

Bamboo - vegetative propagation

EXTENSION, TRAINING AND CONSULTANCY

From the research results generated by KFRI scientists, the knowledge of applied value is being disseminated to others in the form of extension, training and consultancies. Apart from providing service to others, these activities have also helped the Institute to gain some financial benefits. KFD, other State Forest Departments, private/government organisations, college and university teachers and many members of the public have been the beneficiaries.

Training

- **Wood utilisation:** Rubber wood utilisation, use of timber in house construction, interaction meeting with wood industries.
- **Tissue culture**: Low-cost tissue culture techniques for farmers and rural women
- **Forest conservation:** Species diversity protection in home gardens for rural women, forest seed management for KFD, medicinal plants conservation for foresters.
- **Biodiversity:** Community participation in biodiversity conservation, biodiversity training for college teachers.
- **Plantation management:** Clonal propagation of eucalypts, root trainer technology, composting, cultivation of teak and pulpwood species, agroforestry, bamboo propagation and planting.
- **Recognised Centre for Doctoral Programmes:** Research students are trained in Computer applications, Statistical application in forestry, Research methodology and Silviculture.

PFM at Nilambur

Biodiversity training

Extension

- **Supply of seedlings:** Seedlings and seeds of forest tree species to farmers, state forest departments and industries.
- **Computer training:** Computer science students are guided to complete their mandatory project works in KFRI.
- **Institute facilities:** Library, and sophisticated equipment made available to researchers and students from other institutions.
- **Visits by students:** The Institute encourages visits of school and college students.
- **Nature education classes:** KFRI scientists organise nature education classes and field trekking.
- **Exhibitions:** KFRI participates in public exhibitions displaying the research achievements for the benefit of students and public at large. The Institute has a permanent exhibition on "Forests of Kerala" that can be put up in schools/colleges and other organisations on request.
- **Radio talks** - As part of community involvement of KFRI, scientists are invited to deliver radio talks on various topics of public interest.

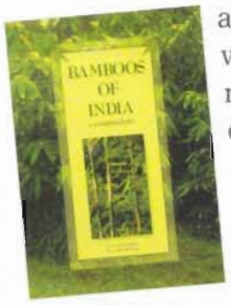
Consultancy

- Identification of timber/insects/plant/fungal specimens.
- Advice on soil/growth problems to private tree growers and forest departments.
- Technical advice on wood processing including preservative treatment.
- Control of diseases/pests in households and farmlands.
- Establishment of greenbelt around industries.
- Establishment and maintenance of a seismic recording station.
- Wasteland afforestation.
- Wildlife related problems such as crop raiding, monkey menace.
- Wildlife census.
- Biodiversity assessments and inventory.

KFRI PUBLICATIONS

- **KFRI Library**

The Institute has one of the best scientific libraries in Kerala with about 14,500 books, and a large number of bound volumes of research journals and reprints of scientific papers covering all disciplines related to forestry. In addition, the library subscribes to a number of research journals every year. A number of documents are available in microforms. A computer data base on Indian forestry literature is being steadily built up to provide literature search service. Students, researchers, scientists from other institutions and officials from the forest departments are encouraged to use the KFRI library facilities.



- **Bamboo Information Centre**

Established in the library in 1989 with the financial support of International Development Research Centre, Canada, BIC acquires, assembles and disseminates bamboo literature for the South Asian region. The centre publishes the periodic BIC India Bulletin, Information Bulletins, etc.

Information Bulletins

- Wood use in Kerala and its implications for forest land use and development
- Matti (Perumaram) *(Malayalam)*
- Termite control in eucalypt plantations *(English* and *Malayalam)*
- Medicinal plants of Kerala forests
- How to establish seed orchards of teak
- Nursery diseases of eucalypts in Kerala and their control *(English* and *Malayalam)*
- Preservative treatment of rubber wood *(English* and *Malayalam)*
- Propagation of bamboos by culm cutting
- Termite control in buildings
- How to establish a cane plantation
- Quality improvement of cane (Rattan) products *(English* and *Malayalam)*
- Storage of bamboo seeds
- Teak
- Thekku *(Malayalam)*
- Compost
- Technology for wood processing *(Malayalam)*

Educational videos

- The Teak Defoliator
- Bamboo - a crop

Handbooks

- Forest Trees of Kerala
- A Field Guide to Animal Signs
- Rare and endangered mammals of Kerala
- Palms of Kerala
- Handbook of Composting

For more information about publications:

The Librarian
Kerala Forest Research Institute
Peechi 680653, Thrissur District, Kerala, India
Tel: +91-487-282037, 282061, 282062, 282063, 282365 Fax: +91-487-282249
E-mail: libkfri@md2.vsnl.net.in

KFRI STAFF

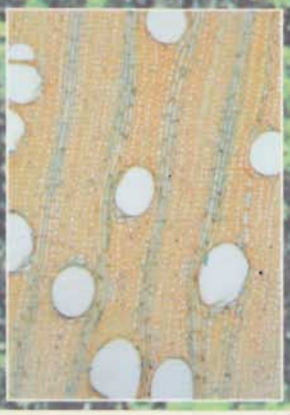
Administration

Director - J.K. Sharma, M.Sc. (Bot.); Ph.D.

Registrar - P. Aravindakshan, B.Sc. (Maths); S.A.S.

Scientists

		Research Interest
Research Monitoring and Evaluation	R. Gnanaharan, M.E.; Ph.D.	Wood Technology (Wood Preservation and Wood Processing)
	A. R. Rajan M.Sc. (Stat.)	Statistics, Computer Programming
Agroforestry	S.Sankar M.Sc. (Ag.); Ph.D.	Soil Science, EIA, Participatory Forest Management
	U.M.Chandrashekara M.Sc.(Bot.);Ph.D	Forest Regeneration, Ecology, Agroforestry System Analysis
	K. V. Mohammed Kunhi M.Sc. (Zool.); M.Phil.	Education and Extension, Fisheries, Limnology.
Botany	K. K. N. Nair M.Sc. (Bot.); Ph.D.	Angiosperm taxonomy, Floristics, Biodiversity
	C. Renuka M.Sc.(Bot.) ; Ph.D.	Taxonomy, Morphology, Biodiversity Conservation, Palms
	M. S. Mukteshkumar M.Sc. (Bot.); Ph.D.	Morphology and Taxonomy , Biodiversity Conservation.
	K. Yesodaran M.Sc. (Bot.); Ph.D.	Mycology and Plant Taxonomy
Ecology	K. Balasubramanyan M.Sc. (Bot.); Ph.D.	Ecology of Evergreen Forests and Forestry Operations
	K. Swarupanandan M.Sc. (Bot.); Ph.D.	Ecology of Grasslands and Moist Deciduous Forest
	A.R.Ramachandra Menon M.Sc.(Bot.);Ph.D	Forest Ecology; Remote Sensing
Forest Economics	P. K. Muraleedharan M. A.(Econ.) Ph.D.	Economics of Biodiversity, Conservation, NWFP.
	Mammen Chundamannil M.A.(Econ.); Ph.D	Economics.
	V. Anitha M.A. (Econ.) Ph.D.	Gender and Tribal Economics., Conservation of PA's
Entomology	R. V. Varma M.Sc. (Zool.); Ph.D.	Forest Insect Pest Management, Termite Ecology and Control.
	George Mathew M.Sc. (Zool.); Ph.D.	Insect Systematics, Biodiversity, Insect Ecology.
	V.V. Sudheendrakumar M.Sc. (Zool.); Ph.D.	Biocontrol of Forest Pests, Insect Pathology, Insect Systematics.
	K. Mohandas M.Sc. (Zool.); Ph.D.	Insect Population Dynamics, Insect Pest Management
	T. V. Sajeev M.Sc. (Zool.)	Insect Population Dynamics, Pesticide Application Techniques.
Genetics	E. P. Indira M.Sc. (Gen.& Pl. Breeding)	Forest Genetics and Tree Breeding.
	E. M. Muralidharan M.Sc. (Bot.); Ph.D.	Plant Biotechnology, Genetic Variability Studies.
NWFP	N. Sasidharan M.Sc. (Bot.); Ph.D.	Forest Flora of Kerala, Ethnobotany, NWFP.
Plant Pathology	M. Balasundaran M.Sc.(Gen.& Pl. Breeding); Ph.D.	Plant Pathology, Disease resistance, Molecular Plant Pathology.
	C. Mohanan M.Sc. (Bot.); Ph.D.	Tropical Forest Pathology.
	E. J. Maria Florence M.Sc. (Bot.); Ph.D.	Plant Pathology, Wood Biodegradation and Soil Microbiology.
	K. V. Sankaran M.Sc. (Bot.); Ph.D.	Fungal Taxonomy, Pathology, Nutrient Cycling, Biocontrol.
Plant Physiology	Jose Kallarackal, M.Sc. (Bot.); Ph.D.	Tree Physiology, Ecophysiology, Water relations.
	K. K. Seethalakshmi, M.Sc. (Bot.); Ph.D.	Plant Physiology, Propagation
	T. Surendran, M.Sc.(Bot.); M.Sc.(Environ.For.);Ph.D.	Clonal Propagation
	C. K. Somen, M.Sc. (Bot.); Ph.D.	Water Relations, Ecophysiology.
Silviculture	K. C. Chacko, M.Sc.(Environ. For.);Hon.Dip.For.	Seed Science, Nursery Technology, Plantation Forestry
	R. C. Pandalai M.Sc. (Bot.); Ph.D.; Dipl.For.	Nursery and Plantation Silviculture, Eco-restoration
	U. N. Nandakumar M.Sc. (Maths); Dipl.For.	Forest Mensuration and Manag., GIS and Remote Sensing .
Soil Science	M. Balagopalan M.Sc. (Chemistry); Ph.D.	Soil Chemistry, Plant Nutrition.
	Thomas. P. Thomas M. Sc. (Ag.); Ph.D.	Soil Physics, Soil and Water Conservation
	M. P. Sujatha M. Sc. (Ag.)	Soil Science
	S. Kumaraswamy M. Sc. (Ag.)	Soil Science, Soil Microbiology, Environmental Science
Statistics	K. Jayaraman M. Sc. (Ag.); Ph.D.	Forest Biometrics
	P. Rugmini M. Sc. (Stat.)	Forest Biometrics
	C. N. Krishnankutty M. Sc. (Stat.)	Demand, Supply and Price of Forest Produce, Agroforestry.
	M. Sivaram M. Sc. (Stat.)	Multivariate Techniques
Wildlife Biology	P. S. Easa M. Sc. (Zool.); Ph.D.	Wildlife Management and Biodiversity Conservation
	K. K. Ramachandran M. Sc. (Zool.); Ph.D.	Wildlife Biology
	P. Vijayakumaran Nair M. Sc. (Zool.); Ph.D.	Wildlife Biology, GIS
	E. A. Jayson M. Sc. (Zool.); Ph.D.	Vertebrate Ecology
	P. Padmanabhan M. Sc. (Zool.)	Bee-keeping, Small Mammals
Wood Science	K. Mahabala Bhat M. Sc. (Bot.) D. Sc.	Wood Technology (Anatomy/Wood Quality)
	K. V. Bhat M. Sc. (Bot.); Ph.D.	Wood Science and Utilization
	T. K. Dhamodaran M. Sc. (Chemistry); Ph.D.	Wood Science, Wood Preservation.
KFRI Sub-centre	N. C. Induchoodan M. Sc. (Forestry); Ph.D.	Ecology, Silviculture.
Librarian	K. Sankara Pillai, M.L.I.Sc.	
Engineer	K.R. Mukundan, B.Sc. (Engg.)	



kerala forest research institute
Peechi 680653, Thrissur District, Kerala, India