

2.4 Forest Management

Overview

Summary of Achievements under the Theme

The wood volume equations assume importance in projecting the total volume at different stages (thinning and final harvest) of plantation growth. Such equations, being developed in respect of *Tectona grandis*, *Prosopis cineraria* and *Ailanthus excelsa* will be of great use to State Forest Departments and other stakeholders. Information Communication Technology (ICT) based information systems being developed on various subjects and species of plants and insects will enable the users to get the desired information satisfying a particular or multiple criteria and obtain the complete datasheet on area of interest. GIS and remote sensing based mathematical models for monitoring lac host belts, discussion forum on forestry, etc. are innovative applications of ICT that are being developed in the council. Mathematical models are in process of development which will help in understanding infestation patterns of destructive insects. Documentation of agroforestry systems, wood flow and market surveys of timber related information provide useful information for various end-users. Study on sustainable development of quality bamboo resource were conducted to help in employment generation and socioeconomic development of various categories of stakeholders. For sustainable management of forest resources, the National Working Plan Code is being revised for MoEF.

Projects under the Theme

Projects	Completed Projects During the Year	Ongoing Projects	New projects Initiated During the Year
Plan	4	13	8
Externally Aided	1	2	0
Total	5	15	8

2.4.2 Sustainable Forest Management (SFM)

Haliyal and Yellapur teak belts in Karnataka were found to be seriously affected by the teak heartwood borer during preliminary surveys. The specific field sites were identified for studying spatial distribution and adult emergence. In another project, research was carried out for development of clump management practices for important bamboo species for enhanced production of quality culms and edible shoots. Sustainable development practices of bamboo resource are being developed for employment generation and socio-economic development in north-eastern India by combining different bamboo species with preferred crops suitable at different localities. Yields of intercrops were studied under different species and spacings of bamboos. Fertilizer application before emergence of new shoots resulted in an increase in culm diameter and internodal length. Studies revealed that farmers prefer to plant horticultural plants and cash crops such as tea, rubber, etc. to bamboo. A training-cum-workshop was organized for farmers on bamboo cultivation and management.

The identification of forest fringe villages in rainfed area of the country was initiated. The determination of socio-economic status of the people residing in forest fringe villages and the ecological status of the adjacent forest areas was carried out in Dehradun district.

2.4.3 Forest Economics

Data pertaining to demand, supply, market intelligence, etc. of bamboo resources were collected from markets of Punjab, Haryana, Chandigarh and Delhi and the same were analysed for quantitative assessment of their production and consumption. In another study, survey was carried out to document the agroforestry systems practised in nine districts of Tamil Nadu.



Information was collected on farm forestry and captive plantations undertaken by TNPL and Seshasayee and contract farming systems adopted by the paper, pulp and match industries throughout the state of Tamil Nadu. Data were compiled on the extent of area covered under tree cultivation in private lands in some districts of Tamil Nadu. Data on wood flow from outside into Tamil Nadu, wood flow to pulp and paper industries, district-wise details of saw mills and the demand and supply of timber in saw mills were documented. The supply chain existing between farmers and industries, particularly paper and matchwood industries, was also documented.

As a continuing process, market price data of commercially important species of timber, fuelwood and Bamboos were collected from selected markets and SFD/Forest Corporation depots all over India. The collected data were compiled, published and disseminated as “Timber and Bamboo Trade Bulletin” to various stakeholders.

2.4.4 Forest Biometrics

Reconnaissance survey was conducted on teak plantations in eight forest divisions of Karnataka and twenty seven sample plots were laid out for productivity studies and growth data were recorded. Similar survey was conducted at 32 sites in nine forest divisions of Gujarat on teak plantations; out of it sixteen sites were selected. Permission was obtained from State Forest Department for felling representative sample trees. Seven sample plots were laid out of *Prosopis cineraria* and *Ailanthus excelsa* in Rajasthan for productivity and biometric studies and preliminary data were collected. Sixteen sites were selected for productivity study and modelling of growth in teak plantations in Gujarat. Permission for felling of sample trees was sought from the State Forest Department.

2.4.5 Policy and Legal Issues

The MoEF, Govt. of India is revising the National Working Plan Code. The task of revising National Working Plan Code was carried out by FRI on behalf of MoEF, Govt. of India. The draft of revised National Working Plan Code was submitted to MoEF, Govt. of India along with the annexures on “Micro Plan Process for JFM Areas” and “Micro Plan of Eco-development for Wildlife Areas”. The criteria and indicators for sustainable forest management were subjected to the process of finalization with the MoEF for incorporation in the document.

2.4.6 Information and Communication Technology (ICT)

Work was conducted for development of Deodar (*Cedrus deodara*) and Kail (*Pinus wallichiana*) Information System using remote sensing & GIS techniques. The literature was compiled and edited. The Deodar and Kail maps of Uttarakhand state were prepared and verified by ground truthing. Similar maps for Himachal Pradesh and J&K are also being developed.

For data mining of wood forming genes of Eucalyptus, sequences were downloaded for forty three wood forming genes. Identification of conserved regions and primer designing was carried out for the above genes. Transferred downloaded sequences and results obtained in to Excel sheets for the genes and siRNA design carried out for the genes. DNA fingerprint information was collected from researchers on Eucalyptus and Casuarina using ISSR/FISSR, RAPD and AFLP markers for development of tree DNA fingerprint database. Standardization of format was completed.

Documentation of information regarding production of lac was done for districts surveyed in Chotanagpur region to apply GIS/RS for identification and monitoring of lac host belts in this region.



An information system is being developed for forest tree species associated insect and their management with special focus on central India. Data were collected for the insect pests associated with *Shorea robusta*, *Dalbergia sissoo*, *Dalbergia latifolia*, *Acacia catechu*, *Acacia nilotica*, *Albizia lebbek*, *Ailanthus excelsa*, Bamboo, *Tectona grandis* and *Butea monosperma* based on scientific name, common name, distinguishing characters, nature of damage, host range, natural enemy and control measures technique. The system provides various combination of key strokes viz. tree species, insect pest, insect pest category and insect pest sub category for data retrieval.

A dynamic database is being developed for forestry discussion forum. Outline of the possible

forms for various internet pages, database structure with all possible records and E-R diagram were prepared with identification of all possible records, fields and relationships between entities, design and development of the graphical user interface.

For development of “Commercial Timber Information System”, necessary software and literature were purchased. Information on required parameters of around 150 commercially important timbers species was collected. Information on timber market was collected. Detailed design of the website diagram was prepared and system coding and testing is under the progress.

Websites of ICFRE and its institutes were continuously updated and upgraded.



Snapshot of Information System on Insects being Developed at TFRI Jabalpur



Search Results Produced by the Web Application (on test data) of AFRI, Jodhpur