

INSTITUTE OF FOREST PRODUCTIVITY RANCHI

The Institute came into existence in the year 1993 with the objective to formulate, organize, direct, manage and carryout forestry research and education in eastern region of the country, comprising the State of Bihar, Jharkhand, Sikkim and West Bengal. Encompassing the picturesque eastern Himalayas in Sikkim and North Bengal, the fertile alluvial expanse of indo-gangetic plains in Bihar and West Bengal, deltaic and coastal mangroves of the world famous Sunderbans, a pocket of Terai Sal forest in the north-west corner of Bihar and tropical deciduous forests of Kaimur and Chotanagpur plateau overlaying rich and enticing mineral resources within its jurisdiction, the Institute of Forest Productivity is a premier forestry research organization catering to the forestry research needs of eastern India. The Institute also functions as one of the research centres of FRI University. The library of this Institute has a rich collection of over 6209 scientific and technical books and journals. A project for comprehensive IT solutions for Indian Forestry Research Information System (IFRIS) is envisaged with the objective to translate the present working system to more responsive, transparent and efficient system. Forty five nos. of 'Computer Desktop Intel v Pro Configuration (with TFT)' were provided to the Institute by E-governance, MoEF, Govt. of India, New Delhi under the scheme of IT Infrastructure for implementing E-governance initiatives.

An abstract of projects run by the Institute is as follows:

	No. of projects completed in 2007-08	No. of ongoing projects in 2007-08	No. of projects initiated in 2007-08
Plan Projects	2	5	5
Externally Aided Projects	1	1	0
Total	3	6	5

PROJECTS COMPLETED DURING THE YEAR 2007-2008

PLAN PROJECTS

Project 1: Studies on variability of bamboo species, their performance, conservation and economics with reference to Bihar, Jharkhand and West Bengal [IFP-016/SLR-4/2002-08]

Findings: By conducting field survey, the number of species in different States encountered were 10 species (in Bihar), 11 species (in Jharkhand), 25 species (in North-West Bengal) and 8 species (in South-West Bengal). Two hundred eighty one soil samples were collected and analyzed for

correlation studies. For *ex-situ* conservation, plantation of 620 superior rhizomes of bamboos of the study sites at Udai Singh Joth, ERS, Sukna, Netaipur, Midnapore, FRC, Mandar and IFP, Ranchi are being maintained. Trials on bamboo vegetative propagation, time of nursery propagation and age of culm etc. were standardized. Nutrient cycling in bamboo stands were assessed.

Project 2: Creation of germplasm resource bank of threatened medicinal plants of Darjeeling Himalayas [IFP-018/EBC-1/2003-08]

Findings: *Ex-situ* medicinal plant garden was created with 11 species namely *Acorus calamus*, *Curculigo orchoides*, *Dioscorea deltoidea*, *Hedychium spicatum*, *Rauvolfia serpentine*, *Asparagus racemosus* Wild, *Embelica officinalis*, *Gloriosa superba*, *Ocimum sanctum*, *Tinospora cordifolia* and *Curcuma caesia*. Eighty five thousand no. of QPMs of medicinal plant were produced, of which 56000 nos. of planting materials were distributed to the farmers, NGOs and States Forest Department of Sikkim and West Bengal for cultivation / trail/ demonstration. Besides, trial plot was created at research plot at Udaising Joth for yield assessment and demonstration to the farmers and Foresters. Remaining 29000 planting materials are ready for distribution during the year 2008-09.



Germplasm Resource

EXTERNALLY AIDED PROJECT

Project 1: Identification, collection and genetic evaluation of important oil yielding trees of Jharkhand (NABARD funded project) [IFP-028/BGT-6/ NABARD /2005 – 08]

Findings: Investigation on variability studies, genetic analysis, association studies and genetic diversity analysis of field biometric traits (clones and progenies), pod and seed characters, seedling traits, biochemical traits of 24 CPTs of Karanj and 23 CPTs of Mahua revealed following findings:-

- Variability available among the selected CPTs for biometric traits, pod and seed traits, half-sib traits and biochemical traits were assessed and observed to have significant variation.
- Genetic estimates were worked out in second part to know the GCV, PCV, Heritability and genetic advances for all the traits under study. It was found that trait volume index, hundred seed weight, vigour index, acid value and total oil content can be improved by breeding.



Important oil yielding trees of Jharkhand



- Inter-relationship between characters by association studies (correlation and path analysis) were worked out. Studies revealed the collar diameter 2D surface area, shoot length and protein content may be considered for selection indenting hire volume index, germination, vigour index and total oil content respectively.
- Genetic diversity of the collected clones using biometric observation were analysed which expressed non conformity with geographical distribution of clones.

PROJECTS ONGOING DURING THE YEAR 2007-2008

PLAN PROJECTS

Project 1: Development of appropriate silvicultural systems for selected medicinal flora of Chotanagpur and Santhal Parganas [IFP-022/FMS-3/2003 – 08]

Status: Vegetative growth of *W. somnifera*, *A. recemosus* and *R. serpentine* is unaffected by shade conditions of Teak and Shisham. Fruit set is also on the higher side in open in *W. somnifera* and *R. serpentine*. Survival percentage is greater in shade. *G. superba* – shade lover, survives only in Agronet (LI-70%).

Project 2: Creation of seed database on economically important forestry species of Jharkhand, aiming at functioning of a forestry seed certification agency [IFP-030/FMS -5/2006-11]

Status: Literature was reviewed on various aspects of seed technology. Identification and selection of superior seed sources was carried out. Observations of physical parameters of seeds i.e. seed weight, length and width, volume, colour etc. were recorded.

Project 3: Vulnerability assessment of climate change and development of adaptation strategies to mitigate the impact on seed and biomass production in forest trees and herbs [IFP-029/FMS-4/2005–09]

Status: Two open-type gas chambers were constructed. Seedling growth measurements i.e. for estimation of plant biomass from Neem, Sissoo and Gamhar seedlings were carried out. Experiment was maintained in open field conditions.

Project 4: Standardization of macro-propagation techniques of *Schleichera oleosa* and their clonal fidelity studies [IFP-032/BGT-7/2006–09]

Status: From Orissa and West Bengal, 10 more superior trees were selected. Branch/scion were collected from different locations of Jharkhand and Orissa. Grafting, air layering have been initiated. Cutting experiment was done according to the season, size and tree age wise. For raising root stock, seedlings were procured from SFD, West Bengal.

Project 5: Species suitability and reclamation strategy for degraded forest soils of Chotonagpur Plateau, Jharkhand [IFP-031/SLR -7/2006–11]

Status: Materials were collected for nursery establishment and field trials from the selected sites under the project. Samples were collected for assessment of growth limiting factors and land



degradation in trial sites. Land preparation, laying out of plots and nursery trials were carried out for screening of species suitability for field trials. Periodic growth data was collected from pot and field trials. Data was analysed and documented.

EXTERNALLY AIDED PROJECT

Project 1: Documentation and inventorization of indigenous traditional medicinal knowledge in selected districts of Jharkhand (Funded by NMPB) [IFP-033/EBC-4/NMPB/2005-08]

Status: Surveys were conducted in the remotest area of Gumla and Simdega districts well known for militant and terrorist activists. Primitive tribe groups viz. Birhos, Kanwar, Korwa and Asurs were discovered. In Tango Parish in Chainpur Block of Gumla district a herbal practitioner was met who conducts training programmes on herbal medicine for interested people from all over India. He also undertakes *ex-situ* and *in-situ* conservation of medicinal plants and trees in his botanical garden. Video recording was carried out on the rare and endangered plant species preserved in his arboretum.



Documentation and inventorization of indigenous traditional medicinal knowledge in Jharkhand

NEW PROJECTS INITIATED DURING THE YEAR 2007-2008

PLAN PROJECTS

Project 1: Genetic evaluation and molecular characterization of *Jatropha Curcas L.* of Eastern India [IFP-038/BGT-10/2007-10]

Status: Literature was surveyed. Survey, identification and selection of CPTs were carried out. Sixteen nos. of accessions were collected from Jharkhand. Field preparation and planting for 36 no. of accessions collected from different States of Eastern India were carried out. Scientific equipments, glassware and chemicals were procured.

Project 2: Study on floral biology, fruiting phenology and germination behaviour in *Schleichera oleosa* [IFP-037/BGT -9/2007-10]

Status: Seeds collected from Jharkhand and Orissa States were processed. Pre-treatments were applied on seeds for study of their germination. Procurement of equipments and chemicals was done.

Project 3: Rooting and acclimatization of *in vitro* shoots of *Schleichera oleosa* [IFP-036/BGT-8/2007-10]

Status: Shoot culture was initiated. More than 25 different media composition were prepared for experiment. Chemicals and equipment were procured.



In vitro shoot of *Schleichera oleosa*

Project 4: Improvement of clonal propagation techniques of bamboos and enhancement in field survival [IFP-035/SLR -8/2007-11]

Status: Planting Materials were collected from South-West Bengal and Jharkhand. Nursery and propagation beds were developed for propagation and trials. Trials were taken up with 5 common species in nursery beds and in poly pots for sprouting and rooting as influenced by soil correction, GPSs etc. Tissue culture propagation of *D. asper* has been continued for different trials on hardening and field survival after planting. Shoot multiplication was carried out by sub-culturing existing cultures of *D. asper*.

Project 5: Assessment of the genetic diversity and development of species specific molecular markers in bamboos in Eastern India [IFP-039/BGT-11/2007-09]

Status: Relevant literature on genetic diversity / population structure of bamboos was reviewed. Marker systems were developed. Survey for identification and collection of *Dendrocalamus strictus*, *Bambusa bambos* and *B. tulda* was carried out in East and West Midnapore (WB). Fifteen species were also collected from BSI, Kolkata and preserved the plant materials at IFP, Ranchi.

TECHNOLOGY ASSESSED AND TRANSFERRED

Technology transferred

IFP has developed technologies related to improving forest productivity and environmental conservation / reclamation for transfer to user groups.

Technology assessed

- Propagation techniques of selected medicinal plants
- Macro-propagation of bamboos
- Laboratory analysis of soil and treatment for deficiencies
- Production of quality planting materials in hi-tech nurseries using root trainers

- Micro-propagation techniques of important forestry species
- Recycling of organic wastes by composting / vermicomposting
- Improved techniques for Lac cultivation
- Bio-reclamation of problem soils and mined over burdens

EDUCATION AND TRAINING

Education

1. Entrance Test Examination for M. Sc. and P. G. Diploma Courses on Forestry under FRI Deemed University, Dehradun was conducted by the Institute on 27th May 2007 at Ranchi Centre.
2. A pre-thesis submission seminar of Smt. Shampa Sahay, Ph.D. Scholar was conducted on 25th September 2007 at the Institute on the research work titled "Formulation of methodologies for reclamation of coal washery rejects in East-Bokaro coalfield belt: A case study" under Doctoral Programme of FRI University, Dehradun.

Training

The following training programmes were organized by the Institute on the national level:

- Jointly organized a field training and demonstration on bamboo propagation with Birsa Agricultural University, Kanke, Ranchi on 16th February 2008.
- Conducted a one day training programme on 'Lac Cultivation' at Tatisringari, Jonha, Jharkhand on 7th March 2008.
- Conducted five days training programme on 'Modern Nursery Techniques' during the period from 24th to 28th March 2008 attending by Asstt. Conservator of Forests of SFD, Jharkhand.
- Organized two days workshop at FRC, Mandar and ERS, Sukna on 'Cultivation and Management of bamboos' attending by progressive farmers, NGOs and SFD personnel during the year 2007 and 2008 respectively.



Workshop at FRC, Mandar and ERS, Sukna on 'Cultivation and Management of Bamboos'

LINKAGE AND COLLABORATION

International

EWI, USA; DFID (U.K.) ; IDRC, UNDP



National

NABARD, NMPB, DBT, CCL, DVC, ILRI, ISM, HARP, BAU, FSI, SFDs (Jharkhand, W.B., Bihar), Planning Commission, GoI, MoEF, GoI.

PUBLICATIONS

- Annual Lac Bulletin
- IFP – A profile
- Proceedings of the 'Regional Workshop on Forestry Extension Strategy Review' held on 23rd March 2007.
- Booklets titled "Medicinal Plant Resources of North Bengal" on species (210 nos.) of useful medicinal plants.
- Souvenir and Abstracts for National Seminar on "Conservation and Management of Bamboo Resources" held on 29th and 30th November 2007 at IFP, Ranchi .

CONSULTANCIES

The following consultancies and other services have been provided to the Institute:

- (i) MoU signed between IFP and DVC for development of green belt at stress sites of 'Chanderpura Thermal Power Station'.
- (ii) Estimation of organic carbon contents of forest soil samples and forest floor litters of various districts of Eastern Zone and evaluation of dry weight percentage at 65°C of forest floor litters under MoU signed between ICFRE and FSI, Eastern Zone, Kolkata
- (iii) Bamboo Resource Survey of Jharkhand funded by Jharkhand State Forest Development Corporation Ltd.
- (iv) Collaboration of SEPC, Kolkata with IFP in the field of scientific cultivation of Lac, and for development of pilot broodlac farm and Lac finishing facilities in Purulia district, West Bengal.

CONFERENCE/MEETINGS/WORKSHOPS/SYMPOSIA/EXHIBITIONS

1. An Orientation Workshop for NGOs selected under "SASVPSY of Bihar State" held on 1st and 2nd May 2007 at IFP, Ranchi.
2. A Regional Workshop on Revision of National Forestry Plan: Research Priority Setting held on 29th June 2007 at IFP, Ranchi.
3. IX Research Advisory Group Meeting of the Institute conducted on 6th and 7th September 2007.
4. A National Seminar on "Conservation and Management of Bamboo Resources" organized by the Institute on 29th and 30th November 2007 at Ranchi under the aegis of Indian Council of Forestry Research and Education (ICFRE), Dehradun and National Mission on Bamboo Applications (NMBA), New Delhi.
5. A "Regional Workshop on Forestry Statistics" organized by the Institute on 7th December 2007 under project "Establishment of network to facilitate collection, processing and



dissemination of statistics pertaining to tropical timber and other forestry parameter in India" sponsored by International Tropical Timber Organization (ITTO).

6. An inception workshop on "Biodiversity Conservation through Community Based Natural Resource Management" organized at the Institute under the UNDP- GOI, CCF- II Project on 12th February 2008.

AWARD

During the Silver Jubilee Celebration of NABARD held on 11th August 2007 at Ranchi, His Excellency Shri Syed Sibtey Raza, Governor of Jharkhand awarded Certificate of Recognition to the Institute of Forest Productivity, Ranchi for undertaking NABARD supported research project on "Identification, Collection and Genetic Evaluation of Important Oil Yielding Trees of Jharkhand". During the occasion His Excellency, Governor of Jharkhand also honoured the Director, IFP by presenting a shawl.

DISTINGUISHED VISITORS

Dr. S.A. Khan from Department of Agroforestry, CSA University of Agriculture and Technology, Kanpur visited the Institute as an expert from 10th to 12th May 2007 to evaluate the completed in-house research project "Development of Agro-techniques for *Gymmena sylvestre* and *Embelia ribes* medicinal plants of high marketing potential".

MISCELLANEOUS

- "World day to combat desertification" was celebrated in the office on 18th June 2007 to draw everyone's attention that desertification can only be tackled by ensuring community participation and co-operation at all levels.
- 'Van Mahotsav' was celebrated at the Institute on 17th July 2007. Tree planting was done in the campus to mark the occasion.