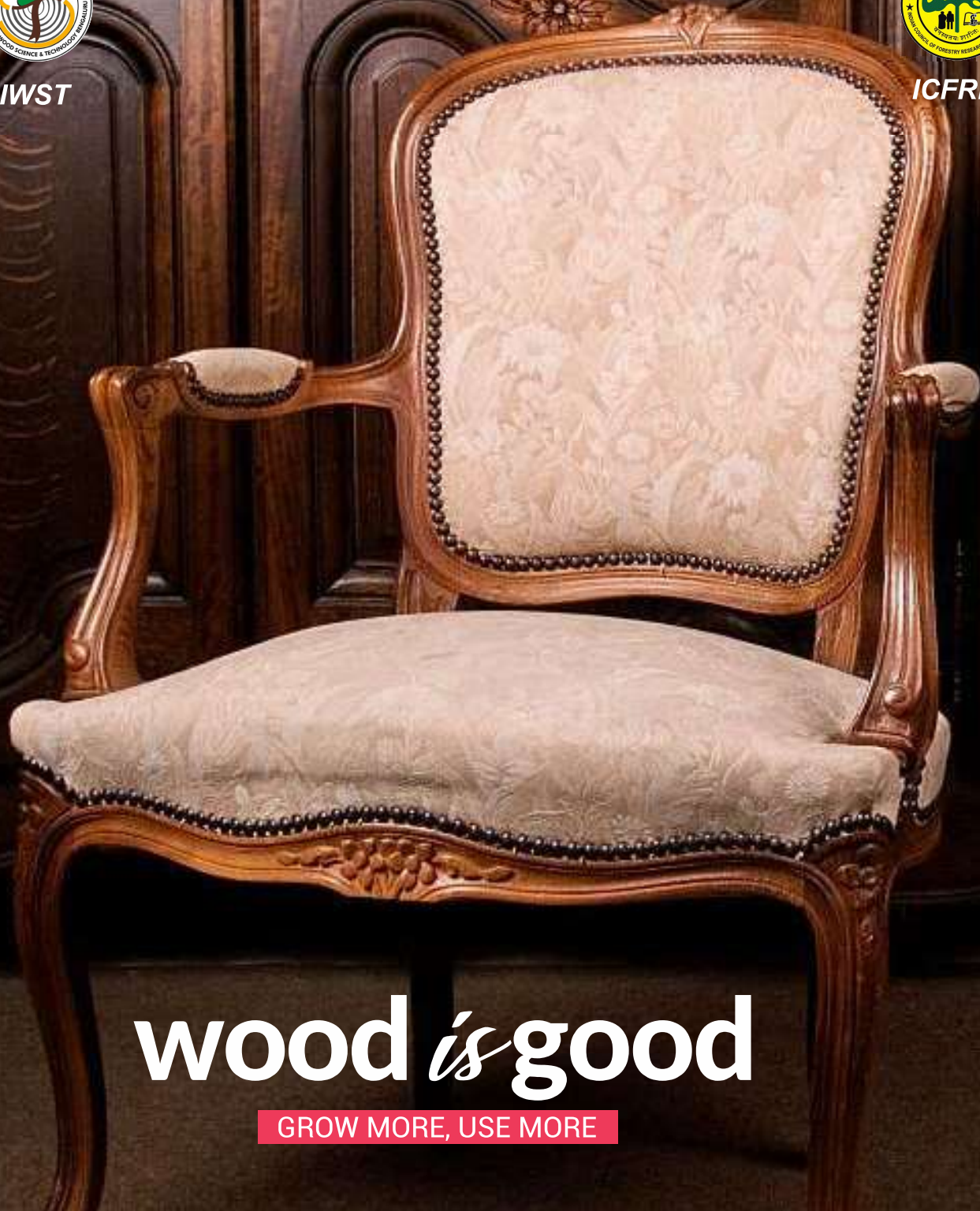




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Vol. 1, Issue 3, October - December 2020

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INDIAN COUNCIL OF FORESTRY RESEARCH AND EDUCATION

(An Autonomous Council of Ministry of Environment Forest and Climate Change, Government of India)

VISION

To achieve long-term ecological stability, sustainable development and economic security through conservation and scientific management of forest ecosystems



MISSION

To generate, advance and disseminate scientific knowledge and technologies for ecological security, improved productivity, livelihoods enhancement and sustainable use of forest resources through forestry research and education

ZiBOC

- A new wood preservative which is comparable to CCA.
- Judicious use of preservative in a non-durable wood greatly enhances (6-8 folds) life of products.



Varieties/ Clones developed

- Developed improved germplasm of many forest tree species.
- Released 47 high performing and disease resistant clones of *Eucalyptus*, *Casuarina*, *Shisham*, *Melia* and *Sarpagandha* with an envisaged production gain of more than 20%. The developed germplasm are being made available to the State Forest Departments and farmers for use in plantations.



High performing and disease resistant clone of *Melia* sp.



CYCUS v. 1.0

Casuarina Yield Calculator Utility Software (CYCUS v1.0) software has been developed to facilitate the farmer and other user agencies in yield estimation which requires only observations on girth of 100 sample trees per acre of plantation.

Wood Welding

Wood welding is new to our country. In this technique wood joints can be made without using nails and adhesives making them more natural and chemical free. A wood welding machine has been designed and fabricated at Forest Research Institute, Dehradun. Success has been achieved in spin welding of wood pieces of few species.



Wood Welding Machine



Indian Council of Forestry Research and Education

New Initiatives

- ☞ Transparent wood- a flexible and biodegradable transparent wood has been fabricated using poplar wood veneer and water soluble polymer- polyvinyl alcohol. The transparent wood exhibited high optical transmittance, high haze and light diffusing property.



Natural wood (Left most), Lignin modified wood (middle) and Transparent wood (right most) placed on a paper with letters "IWST"

Heat storage based modified Solar Kiln

- ☞ Solar heat storage system based solar kiln has been developed by Forest Research Institute, Dehradun for timber drying. The solar heat is trapped using suitable phase change material (PCM). The New solar kiln is able to trap 39 % more heat in winters as compared to traditional green-house based traditional FRI solar kiln developed during 1970.



Head based storage Solar Kiln

Xylarium

- ☞ Collection of authentic wood samples both from India and other countries, depicting wood biodiversity of the country like lightest, heaviest, sweet-smelling, foul smelling, smoothest, streaked, variegated wood and wood of different colours, etc. The collection of wood cross sectional discs depicting variation in sapwood and heartwood colour is a unique feature of the xylarium.
- ☞ Wood identification services.



Xylarium- Collection of Authentic wood samples

Tree hollowness detection technique based on ultrasonic waves

- ☞ Forest Research Institute, Dehradun has developed ultrasonic techniques (Non-destructive testing) to detect the location and magnitude of the hollowness of the standing tree. This will help to remove the potential human hazards by way of falling down of such trees during a high wind regime in Urban Forestry.



Measurement of hollowness in a tree using ultrasonic detector

Agroforestry models

- ☞ Various agroforestry models (Poplar, Eucalyptus, Melia, Casuarina and Babool) have been developed to improve green cover, enhance farmers income and to mitigate climate change .



Poplar based agroforestry model with wheat

Innovative Bamboo Bottles

- ☞ Techniques for making bamboo bottles by using Bamboo Treatment Technologies of ICFRE. Most suitable bamboo species for making bottles are Shil Barak (*Bambusa salarkhanii*) & Barak (*Bambusa balcooa*). One full bamboo is sufficient for making 21 full size bottles and 12 small bottles.



Bamboo bottles

For further details please contact :

Assistant Director General, Media & Extension Division,
Indian Council of Forestry Research and Education,
Dehradun - 248 006
Phone:- +91-135-222 4814, +91-135- 2755221.

WOOD POLYMER COMPOSITE

A Technology from IWST

- ♦ The technology provides an opportunity to replace up to 50-60% plastics by environment friendly natural fibers.
- ♦ Any type of woody material like lops and tops, branches, wood waste, saw dust, bamboo, lantana, jute, coir, etc. can be used for this purpose.

These composites have a wide range of applications like light structural components, interiors (wall cladding), garden and outdoor products, injection molding products like hangers, pens, pencils, pen stands, trays, and other utility products.

The advantages of using wood polymer composite material:

- Cost effective compared to virgin thermoplastics
- Superior in strength and stiffness than plastics
- Dimensionally stable
- Recyclable and environment friendly than virgin plastics



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आर पी गुप्ता
R P Gupta



सचिव
भारत सरकार
पर्यावरण, वन एवं जलवायु परिवर्तन मंत्रालय
SECRETARY
GOVERNMENT OF INDIA
MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE



FOREWORD

Wood is an old-age fascinating traditional material being used by various sectors viz., construction, furniture, panel products, paper and pulp, sports goods, agricultural implements, etc. Unlike other materials, wood can fit into any setting and blend tastefully, be it modern, rustic, or traditional and its versatility extends from indoors to the outdoors. Among various sectors, furniture sector is the one where India can meet the domestic demand and simultaneously become 'a global factory in the world'. Indian wooden furniture has been influenced by numerous cultures and traditions from historic times and it has emerged as one of the finest artistic forms in the world. Despite the technological advances and highly skilled craftsmanship, India has failed to grow internationally to its full potential. The expansion of manufacturing centres, setting up of research institutes and organizing the scattered furniture industry are long-term development plan but the immediate focus should be on the promotion of traditional and cultural wooden furniture and revival of diminishing traditional furniture through set up of government-sponsored training centres and investment opportunities from MSME sector.

Furniture manufacturing in India is mostly driven by the designs chosen; the inputs come from in-house designers and market feedback. Manufacturers consider several aspects related to the customer (such as demography, lifestyle, motivation and aspiration, needs and preferences, etc.), raw material (type, quantity and availability) and internal capability (expertise, quantity and availability of labour, production process complexity and delivery time) for developing different designs, which in turn, determine the functionality of furniture, look, feel and value. Depending on the end-user requirements, the furniture produced in India falls into two broad categories: domestic furniture meant for home use and commercial furniture meant for office and hospitality sectors.

For this to happen, innovative designs, quality assurance and certification of the furniture are very important aspects with which this sector has to deal with. At the same time, the furniture sector of the country is facing many challenges which are to be addressed for desired growth of industry.

Institute of Wood Science and Technology (IWST), Bengaluru (an Institute under the Indian Council of Forestry Research and Education), besides doing research on wood science at national level, has been continuously working for development of skill enhancement programme by providing different kind of trainings in the area of woodworking to attain global competitiveness by using state-of-the-art machineries. The institute has come out with two issues of its quarterly magazine "Wood is Good: Grow More, Use More" to share the scientific knowledge and success stories with various stakeholders. The magazine has wide circulation to bring an awareness among wood users about the latest developments in wood utilization by various sectors.

I hope the 3rd issue of this quarterly magazine which has been focused on different aspects of furniture sector will act as a source of information to help furniture sector of the country to grow and grab the domestic as well as export markets.

(R P Gupta)

New Delhi
18th January, 2021

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TESTING AND TRAINING SERVICES @ IWST

Testing Services

- ♦ Identification of wood
- ♦ Physical properties of wood tests (Specific Gravity/Density of Wood, Moisture Content, Shrinkage)
- ♦ Mechanical properties of wood (Static Bending, Compression Parallel to Grain, Compression Perpendicular to Grain, Tension Parallel to Grain, Tension Perpendicular to Grain, Hardness, Shear, Nail Holding Power, Screw Holding Power)
- ♦ Determination of calorific value of wood
- ♦ Thermo gravimetric analysis of lignocellulosic material
- ♦ Determination of penetration and retention of preservative in the treated wood
- ♦ Wood polymer composites
- ♦ Preservative solution analysis
- ♦ Proximate analyser (fixed carbon content, volatile content, ash content and moisture content)
- ♦ Estimation of percentage of Sandalwood oil and GC analysis of oil
- ♦ Distillation of essential oil and estimation of oil yield by hydro distillation method
- ♦ Identification services decay fungi/mould
- ♦ Supply of fungus culture per tube
- ♦ Testing of bio-efficacy of preservatives/ insecticides against borers
- ♦ Sandalwood farming and managing its health Consultancy
- ♦ Testing of wood preservatives/fire retardants
- ♦ Specific information by post

Short Term Training Courses (3/5 days)

- ♦ Bamboo: Tissue Culture
- ♦ Sandalwood: Tissue Culture Techniques
- ♦ Sandalwood: Seed Handling, Nursery and Plantation Technology
- ♦ Wood Seasoning and Preservation
- ♦ Sandalwood: Farming and Management of its Health
- ♦ Extraction and Quality Assessment of Sandalwood and other Essential Oils
- ♦ Wood Modification
- ♦ Field Identification of Important Timbers
- ♦ Clonal Propagation of *Melia dubia*
- ♦ Sandalwood: Establishment and Maintenance of Healthy Nurseries and Plantations
- ♦ Insect Pest Management
- ♦ Bamboo Agarbatti Stick Making

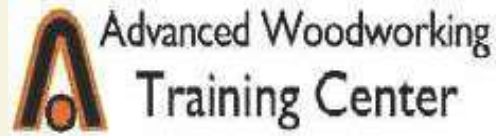
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The Advanced Woodworking Training Center (AWTC) started in 2003 as an Indo-Italian joint project between Institute of Wood Science and Technology (IWST), Bengaluru, Italian Trade commission (ICE) and the Italian Woodworking Machinery and Tools Manufacturer's Association (ACIMALL). The Centre, presently being run by IWST, is regularly offering throughout the year following two advanced woodworking training courses.

A. One Year Diploma Course in Advanced Woodworking

B. Certificate Course in Wood Product Designing and Development

Level 1: Conventional Woodworking and Finishing (4 Weeks)

Level 2: Product Designing and Development on CNC Router (4 Weeks)

Level 3: Product Designing and Development on PYTHA 3D (2 Weeks)

Aim of the Course: To enhance the skill in the area of woodworking to attain global competitiveness by using state of the art machineries. Upon successful completion of training, the trainees will be able to handle advanced woodworking machines for product development. The centre also liaison with wood based industries for placement.

Target Group: Individuals/students/carpenters/persons working in wood based industries.



DETAILS OF COURSES AT AWTC

A. Certificate Course in Wood Product Designing and Development

Level 1 – Conventional Woodworking and Finishing (4 Weeks)

Module I – Fundamentals of Woodworking

- Enrollment and introduction about AWTC "Wood as a Material" (Regarding tree, saw milling)
- "Wood as a Material" (Information about types of wood, identification of wood, defects in wood both natural and due to attack of insects)
- Properties and uses of wood and panel material (Physical properties, mechanical properties, electrical and acoustical properties)
- "Wood as a Material" (Information about types and advantages of seasoning the wood and drying defects during seasoning)

Module II – Basic Mechanical Wood Processing

- Basic workshop calculations like measurement of length, area & volume
- Working examples on measuring of length, area & volume in British and metric system
- Working examples on conversion on pressure, power, work done, cutting speed and feed, conversion of temperature
- "Wood as a layer composite material" like ply board, block board, flake board, glue lam, laminated veneer lumber, cross laminated timber
- "Wood as a particle composite material" like particle board, fibre board & chip board
- Bamboo as a construction material

Module III – Advanced Mechanical Wood Processing

- Basic engineering drawing –
- Demonstration on free hand sketching, pictorial drawing, lines and dimensions.
- Plan of cut, bill of material preparation, estimation and costing of panel furniture.
- Orthographic projection
- Wood protection technology
- Types of adhesives and properties and uses
- Wood finishing (surface preparation, types and selection of different grit sand paper, sealent, varnishing / polishing / procedure)
- Panel material finishing (lamination, painting, membrane and post forming procedure)
- Industrial Visit

Level 2 – Product Designing and Development on CNC Router (4 Weeks)

A. POD and Rail 3 Axis Router

Module I – Fundamentals of CNC POD & Rail in 3Axis Router

- Introduction about Conventional, NC and CNC Machines
- Machine details, axes details, configuration process

Module II – Basic Programming and Operations on CNC POD & Rail 3Axis router

- BIESSE WORKS software structure and details, ATS and FT machine details.
- BIESSE works window description drill un tooling and symmetry explanation
- Drill tool fixing and programming
- Practicing on system bore, generic bore and sawing operations

Module III – Advanced Programming and Operation on CNC Router

- Milling or routing and optimiser results
- TEXT writing
- Lessons exercise
- Pocketing, table tooling

B. KFT 1224 3-Axis Router

Module I – Fundamentals of CNC KFT 1224 in 3-Axis Router

- Difference between POD and rail
- & KFT 1224 CNC machines , Course Objectives
- Machine details, axes details configuration process

Module II – Basic Programming and Operations on CNC KFT 1224 3 Axis Router

- b-solid software structure and details, ATS and FT machine details.
- b-solid window description drill un tooling and symmetry explanation
- Drill tool fixing and programming
- Practicing on system bore, generic bore and sawing operations

Module III – Advanced Programming and Operation on CNC Router

- Milling or routing and optimiser results
- TEXT writing
- Lessons exercise
- Pocketing, table tooling

Level 3 – Product Designing and Development on PYTHA 3D (2 Weeks)

Module I – Fundamentals of 2D and 3D Engineering Drawing with PYTHA Software

- Introduction about PYTHA software, difference between 2D & 3D
- Movie Tutorial

Module II – Basic Programming and Operations on 2D & 3D with PYTHA Software

- Basic introduction about panel and important icons
- Library design & 4 view usage
- PYTHA 2D lessons practice

Module III – Advanced Programming and Operation with PYTHA Software

- PYTHA 3D lessons practice & creating cabinets
- PYTHA 3D lessons practice & material list
- PYTHA 3D lessons practice & usage of bar code
- TEST, VIVA and Certificate Distribution



B. Diploma in Advanced Woodworking (One year)

FIRST SEMESTER

Module 1: Foundation: Materials

- Understanding of wood as a material
- Introduction to solid wood & panel boards
- Materials in modern furniture industry
- Legal aspects of wood transit

Module 2: Foundation: Engineering

- Elements of mechanical engineering
- Introduction to vacuum technology
- Introduction to Electrical and control technology
- Introduction to Pneumatics & Hydraulics
- Basic carpentry and hand tools

Module 3: Processing using machines

- Conventional woodworking machines
- Sizing machines
- CNC Routers & Processing Centres
- Edge banding machines
- Drilling & boring machines
- Introduction to CAD / CAM & application S/W

Module 4: Processing using machines & allied processes

- Hot Press
- Sanding machines
- Painting & finishing
- Tools, accessories and consumables
- Process planning & work flow

Module 5: Systems

- Loading & unloading systems
- Handling, storage and retrieval systems
- Dust extraction systems

SECOND SEMESTER

Module 6: Safety

- Machinery safety
- Safe practices in woodworking industry

Module 7: Maintenance

- Maintenance of woodworking machinery & equipment Troubleshooting

Module 8: Assembly & Joinery

- Hardware, Fittings, tools & equipment used for furniture assembly
- Productivity & cost estimation
- Supervision and management
- Cabinet assembly

Module 9: Advanced Topics

- Advanced application software (CNC, CAD/CAM & 3D Software)
- Advances in processing techniques
- Introduction to Smart Factory & Industry 4.0

Module 10: Project (Optional 10.1 or 10.2)

- Industrial attachment
- Project work: Cabinet making



IWST Activities during October-December, 2020

Webinar on Clonal Propagation of Tree Species

Institute of Wood Science and Technology, Bengaluru had conducted a virtual workshop on 'Clonal Propagation of Tree Species' on 7th October, 2020. The online event was inaugurated by the DG, ICFRE, who also released the book of abstracts received for the workshop. Director, IWST was the Chairman of the programme, with Sh. V.S. Shettepanavar as Co-ordinator, and Smt. Tresa Hamalton as Organising Secretary. Researchers working on various macro- & micro-propagation techniques and their applications presented their findings during the 3 technical sessions, and recommendations were framed by expert members during the plenary session. The workshop was attended by PCCF's and officers from SFDs, researchers from various institutes including ICFRE institutes, Agricultural universities, SFRIs etc.



HRD training programme for ICFRE Scientists



Institute of Wood Science and Technology, Bengaluru organized one day training programme on 'Integrated Pest and Disease Management' virtually for ICFRE Scientists and Officers on 22nd October, 2020 as a part of HRD training programme for ICFRE Scientists. More than 39 Scientists and Officers of ICFRE institutes took active participation in the training Programme through video conferencing. Shri A.S. Rawat, Director General, ICFRE Inaugurated the training programme during which he emphasized the need of urgency in controlling the sandal spike disease by doing holistic research including identification of the vectors

which are responsible for spreading of the disease. Director General released the Technical Bulletin titled "Disease alert on eruption of the Sandal Spike Disease (SSD) in conservation and cultivation of Indian Sandalwood (*Santalum album* Linn.)" authored by Dr. R. Sundararaj and Shri R. Raja Rishi, Scientists, IWST. The experts from IWST and other research organisations delivered lectures on pest and disease management aspects of sandalwood.

Webinar on Sustainable Sandalwood Plantation Management

Indian Institute of Plantation Management (IIPM) Bengaluru (An Autonomous Organisation of the Ministry of Commerce & Industry, GoI) in collaboration with Institute of Wood Science and Technology (IWST), Bengaluru organised a webinar on Sustainable Sandalwood Plantation Management (SPM) was held on 5th November, 2020 from 10.30 am to 1.15pm. Dr. Dhanakumar, Director IIPM informed the audience about how Sandalwood would be most sought after wood material in times to come as there is severe shortage and huge demand. He welcomed Dr. M. P. Singh, IFS, Director, IWST, speakers and the participants (110 participants) across the country. In his special address, Dr. M.P.Singh, emphasised how IWST and Indian Sandalwood has been closely associated for more than eight decades. Considering its dwindled population and to encourage growing of Sandalwood, IWST is trying its level best to enhance the human resource in Sandalwood research and also extend the information through regular training programmes.

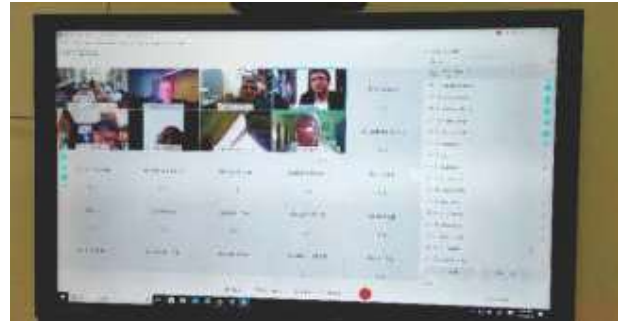


As IWST is seriously pursuing the process of forming a Sandalwood Development Board which would help in sustainable utilisation and conservation of this iconic species.

He emphasised that time has come for IIPM and IWST to foster a strong relationship and appreciate the initiative taken by IIPM. This was followed by five lectures on various aspects related to Sandalwood in which three were from IWST Scientists which focussed on providing overview about Indian Sandalwood, production practises and government regulations on Sandalwood cultivation, and marketing and export of Sandalwood by Dr. Arun Kumar, Scientist-F, Dr. Sundararaj R., Scientist-G and Mr. Soundararajan V, Scientist-D, respectively. The other two lectures were by Dr. Chidananda N. from Karnataka Soaps and Detergents Limited, and Tony Page, Senior Researcher, Tropical Forests and People Research, Centre University of Sunshine Coast, Australia. All the topics generated substantial interest and discussion among the participants.

Webinar on Wood Modification Technologies

A webinar on “Wood Modification Technologies” was organised by the Institute of Wood Science and Technology, Bengaluru on 19th November 2020 to discuss different types of wood modification processes (chemical and thermal modification) and applications of modified wood in various sectors. Wood modification is one of the effective and eco-friendly methods to improve quality of low durability wood for indoor and outdoor usages. It also help in climate change mitigation by enhancing carbon locking period in wood. The webinar was attended by about 120 participants representing wood based industries, forest corporations, researchers, foresters, architects, and students. Dr. M.P Singh, Director IWST welcomed the participants. Sri A.S. Rawat, Director General, Indian Council of Forestry Research and Education (ICFRE), Dehradun inaugurated the webinar. Dr. K.K. Pandey, IWST, Bangalore made a presentation on overview of wood modification processes and work carried out at IWST in this field. Dr. Andy Pitman from Lignia wood Company, UK, made presentation on resin impregnation technology. Mr. Nirav Kapadia, Ritikaa Enterprises, Mumbai presented status on use of chemically modified wood (Accoya wood) in India. Dr. S.R. Shukla made presentation on thermal modification process



developed at IWST and Mr. Sanjay Goel of DAF Industries, Hyderabad presented about production of thermally modified wood in India. Dr. Shailendra Kumar talked about work being carried out at FRI Dehradun on Thermo-Hydro Mechanical process used for wood modification. The webinar generated a lot of interest amongst the participants' particularly wood-based industries to take different technologies developed by IWST further to industrial scales. It was emphasized that continuous interaction and collaboration is required between the research institutes and the industries for developing and adopting the indigenous technologies under 'Make in India' initiatives of Government of India.

Celebration of Constitution Day



Institute of Wood Science & Technology (IWST) celebrated the “Constitution Day” on 26th November, 2020 at Dr. B.R. Ambedkar Hall. The celebration started with reading of Preamble of the Constitution. The reading of preamble was followed by key note speech by Dr. V.P. Tewari, Scientist-G (Retd.) and Ex-Director of HFRI, Shimla. After the key note speech, discussion on constitutional values was held and all the officers/Scientists shared their views on the constitution values and all the staff members participated enthusiastically following strict social distancing.

Webinar on Forest Dynamics Plots: tracing the footprints of climate change impacts through vegetation

IWST, Bangalore and ICFRE, Dehra Dun has conducted a webinar on 02.12.2020 on "Forest Dynamics Plots: tracing the footprints of climate change impacts through vegetation". Dr. M.P Singh IFS, Director, inaugurated this event and highlighted the importance of long-term studies, and need for such meetings to strengthen cooperation among the ICFRE institutes, IISc, ATREE, KFRI and IFP for long-term studies on forests; also pointed out the outcome of the meetings will have a better scope on the ongoing all India co-ordinated research project titled "Study of Climate driven effects on Indian forests through long term monitoring", which is supported by MoEF & CC, Govt. of India. Sri Arun Singh Rawat IFS, Director General, ICFRE, in his opening remarks, stressed the significance of long-



term studies on effect of climate variability on forest ecosystem with the historical background of studies from India; and also opined that we all need to know, to what extent our forest are resilient to change in climate. Sri Sanjai

Mohan IFS, PCCF (HoFF) in his remark emphasized the need for such long term studies for understanding the effect of climatic change. He shared his experience based on studies carried out in Karnataka and suggested to look into past studies carried out by different workers and make use of the data. Prof. R. Sukumar, IISc, in his keynote address explained the gathering with the results from Mudumalai 50 ha permanent plot monitored over past 3 decades, and also introduced a complementary research program - long term ecological observation (LTEO). Experts Lt. Dr. E.S.K. Udupa (Sri JCBM College, Sringeri, Karnataka) Dr. H.S. Suresh (CES, IISc, Bengaluru), Dr. R. Ganesan (ATREE, Bengaluru), Dr. Ayyappan (French Institute, Pondicherry),

Dr. K.A. Sreejith (KFRI, Peechi, Thrissur, Kerala) and Dr. K.H. Vinay Kumar (EMPRI) presented their biodiversity monitoring studies, specifically on sampling methods with key results. Dr. T.N. Manohara (IWST, Bengaluru) proposed the plan of establishing two 5 ha plots in the Kudremukh National Park and a series of 3 ha plots in Dandeli-Anshi Tiger Reserve (Kali Tiger Reserve) in Karnataka. Dr. H.S. Suresh (CES) elaborated on plot laying and inventorying protocols for the long-term monitoring of forests. Shri N. Bala, National Programme Coordinator, AICRP-Climate change, FRI, Dehradun gave a concluding remarks with a thanks note to the organizers and participants of the webinar.

Workshop Training for IFS Officers

The health of trees is essentially important as their health is integrally linked with the balance and sustainability of ecosystems. With this preview, the Institute of Wood Science and Technology, Bangalore organized two days training workshop on “Integrated pest and disease management in nurseries, plantations and forests” from December 21-22, 2020 for serving IFS officers and 25 officers attended the training. The training was inaugurated by Dr. M.P. Singh, Director, IWST Bangalore. The topics presented in the first day were “Insects as pests and the potential of natural durability of timbers to manage them” by Dr. R. Sundararaj, Scientist-G, IWST; “Non Pesticidal approaches for the management of insect pests” by Dr. N. Bakthavatsalam, Director, NBAIR, Bangalore; “Emerging pathological problems in forests and their management by Dr. Amit Pandey, Scientist-G, FRI, Dehradun and “Importance of Biofertilizers in Forestry Practices” by Dr. V. Mohan, Scientist-G, IFGTB, Coimbatore. The topics presented in the 2nd day were “Containment of phytoplasma diseases through management of insect vectors and accreditation of seedlings” by Dr. Amit Yadav, Scientist-D, NCCS, Pune; “Urban tree health and role of tree transplantation” by Dr. A. Muthukumar, Scientist-E, IWST; “Challenges and



management of forestry important insect pests in nurseries and plantations” by Sh. R. Raja Rishi, Scientist-D, IWST, and “Good Silvicultural practices for the best health of trees with special reference to sandalwood” by Dr. R. Sundararaj, Scientist-G, IWST. Finally panel discussion was held under the chairmanship of Dr. M.P. Singh, Director, IWST and all the participants were delighted for getting maximum benefits from the training which will help them for suggesting the course of action for maintenance and management of healthy and sustainable forests, thereby achieving ecological and economical productivity.



THE INDIAN ACADEMY OF WOOD SCIENCE

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P.O. Malleswaram, Bengaluru-560 003 (India)
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The Indian Academy of Wood Science was founded in 1968 to advance the knowledge of wood science & technology and covers in its activities all the aspects related to wood, cellulose and their products such as logging, saw milling, wood working, plywood, fibre boards, particle boards, improved and composite woods, cellulose and cellulose based sciences and industries and allied fields. The Academy runs a Journal called "Journal of the Indian Academy of Wood Science". In addition to this, it also organises seminars and workshops. During some annual meetings, lectures from eminent scientists are also arranged. The Academy has joined hands with Springer, an internationally reputed publishing house, for bringing out the journal fully online for wider international readership. Authors may submit the manuscript of their research papers online following the Springer publication link <http://www.editorialmanager.com/jiaw>



APPLICATION FOR MEMBERSHIP

To,
The General Secretary
Indian Academy of Wood Science
Institute of Wood Science & Technology Campus
P.O. Malleswaram, Bangalore-560 003 (India)

Sir,
I wish to become a member of the Indian Academy of Wood Science and give below the necessary particulars for enrolling as "Corporate Member/Institutional Member/Individual Member" (as the case may be). Necessary remittance of Rs.* is made by a Demand Draft/Cash, which may please be acknowledged. I agree to abide by the constitution of the academy and agree to the code of ethics contained therein.

Place:
Date:

(Signature of the Applicant)

1. Name of applicant in full (in block capitals)	
2. (a) Date of Birth, (b) Age (in case of individuals only)	
3. Academic and professional qualifications (in case of individuals only)	
4. Present employment/how engaged and brief history of previous career in case of individuals (separate sheet may be attached, if necessary)	
5. Brief description of general activities in case of Corporate, Institutional Members	
6. Address to which communications should be sent including phone, fax & e-mail	

Demand Draft should be drawn in favour of 'Indian Academy of Wood Science' and payable at Bangalore.

Membership Type	Annual Fee	Life Time Fee
Indian:		
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Foreign:		
Corporate	N. A.	US \$ 2,500
Institutional	US \$ 50	N.A.
Individual	US \$ 20	US \$ 200

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Need an act to revive agro wood based industry sector

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As the advent of the latest National Forest Policy of India (1988) necessitated the paradigm shift of the then 'forest-based' industries to 'wood-based' industries, supply of raw material was limited as it was either from agroforestry ('AgriWood') or by imports. Dwindling imports due to the price escalations of wood raw materials in the international markets and related import tax issues presented challenges to the sustainability of wood-based industries. Organizing internal supply of wood raw materials was another challenge, as promotion of the production of AgriWood by farmers was necessary, but suffered from the absence of adequate legislation for exclusion of the same from restrictive legal provisions applicable on harvesting and transportation of trees planted on farmlands. All these

issues, emerging from Industries-Institute Meet held at Kolkata in December 2019, Bengaluru in January 2020 and Gandhidham in March 2020, were dealt in detail in the April-June 2020 issue of this publication.

The scope and implications of the 'Farmers (Empowerment and Protection) Agreement on Price Assurance, and Farm Services Act, 2020' and the 'Farmers Produce Trade and Commerce (Promotion and Facilitation) Act, 2020' are also uncertain as far as its benefits to AgriWood are concerned. The July-September 2020 issue of this publication carried an article demonstrating how plywood industries moved away from forest-based timber in 1990s to AgriWood grown on farmers lands by 2010s. But the industry has been almost stagnant for more than a decade. Government of India tried to bring in some changes in the establishment and regulation of these wood-based industries by amending the 'Wood Based Industries (Establishment and Regulation) Guidelines, 2016' in 2017. It is provided in Para 8 of said Guidelines that:

Following industries / processing plants not using round logs of domestic origin or operating without a band saw or re-saw or circular saw of more than thirty-centimeter diameter shall not require license

Industries /processing plants which use:

- a. sawn timber, cane, bamboo, reed, plywood, veneers or imported wood, procured from legitimate sources*
- b. block board, MDF or similar wood-based products, procured from legitimate sources*
- c. round log/timber from species declared as agroforestry/agricultural crops and/or exempted from the purview of the felling and transit regime in the concerned state/UT, and procured from legitimate sources*

However, SLC of the concerned State may allow installation of circular saw of diameter up to 60 centimeter in such industries having specialized requirement. Such industries shall be registered with the Forest Department of the concerned state/UT and shall be regulated, details of which are to be prescribed by the concerned state!UT

Thus, it is clear that there is no requirement of license for establishment of MDF or Particle Boards since they don't use round logs. Residual wood used by these industries is obtained from lops and tops of agroforestry species. Even plywood industries sourcing agroforestry species will not require license for establishment and operation so long as other regulatory framework is in vogue. The conditions of registration and regulation of such industries have been entrusted to the Forest Department of the concerned State/UT to ensure procurement of raw material from legitimate sources. Therefore, it is the responsibility of the State Government to prescribe details of the regulation to ensure legality of raw materials for such industries while registering them for establishment and their operation. These guidelines have not resolved the issue of

establishment of new wood-based industries for more than a decade, resulting in lack of demand for AgriWood as compared to increasing supply from the farmlands.

The recent attempt in the State of Uttar Pradesh to establish new wood-based industries also met with same legal challenge. National Green Tribunal took the stand that wood-based industries can be allowed only after ensuring raw material availability to sustain such industries. This has to be ascertained in actual terms and not on mere assumption. NGT found the estimate given by Govt of UP not scientific. The required level of scrutiny laid down with the objective of conserving existing forests has, due to the precautionary spirit, extended to AgriWood obtained from farmlands, jeopardizing the growth of the wood sector in the country.

As a part of the actions contemplated for reviving the wood-based industries of the country, it is high time to take proactive steps for safeguarding the sector; IWST took certain catalytic actions of suggesting a new enactment, without which further sustenance of the timber and wood panel industries will be in doubt. The WhatsApp platforms organized by the Institute, 'AgriWood Agroforestry' and 'Wood Based Enterprises', paved the way for a virtual follow up of the deliberations to summarize a proposal to the government for new enactment.

Wood-based industries (WBI) consist of housing, construction, packaging, furniture, handicrafts, sports, railways, ship building, mining, bioenergy, pulp and paper, plywood and panel industries, and consume more than 70 million m³ of wood annually for producing wood products. As per the Paris Climate Agreement, India is committed to achieve the NDC targets by creating additional carbon sink of 2.5 to 3 billion tonnes of CO₂ equivalent through additional forest and tree cover by 2030. Trees outside Forests (ToFs) / agroforestry spearheaded by private people (farmers) in growing plantations of Poplar, Eucalyptus, Acacia, Silver Oak, Casuarina, Rubber Wood, Subabul, etc., has played an important role in catering to more than 90% domestic timber demand. The defined harvesting cycle of various important ToFs provides a great opportunity to lock the sequestered carbon. ToFs / agro-forestry if managed in a climate smart manner have a potential of achieving two-thirds of forestry sector NDC targets. The ToFs / agro-forestry plantations have also played an important role in stabilizing the forest and tree cover of the country by not only adding to area under tree cover but also providing a substitute to the timber harvested from forests and hence, conserving the same for ecological functions.

However, ToF/ agro-wood sector is facing several problems and requires separate mechanism to handle, resolve and facilitate the growth of ToFs / agroforestry sustainably. A new Act, with accompanying Rules and Regulations is required for promotion and facilitation of the ToFs / agroforestry on private / non-forest lands on following grounds:

- ♦ Trees outside the forest (ToF) are defined as all trees located on lands excluded from the definition of 'forest'. Trees outside forests, mainly growing on private land, are the main source of wood in the country for industry as well as domestic fuel wood. Absence of dedicated and focused national policy and a suitable institutional mechanism for ToF/ agroforestry, non-existence of any near- extension and institutional support mechanisms, lack of certified quality planting materials, inadequate research on agroforestry models suitable across various ecological regions of the country, inadequate marketing infrastructure and price discovery mechanisms, lack of

Unlocking Agroforestry in India

Proposal for Promoting and Facilitating Growing Trees on Private/Non-Forest Lands

An act to provide for the creation of an ecosystem where farmers growing trees in their private lands, traders and industries enjoy the freedom from any regulatory regime; to promote availability of certified/ accredited quality planting stock; to provide for risk coverage from natural calamities; to promote efficient, transparent and barrier free interstate and intra state trade and commerce of wood grown on private lands, henceforth called AgriWood; to provide and facilitate framework for electronic certificate of origin and ownership; to facilitate remunerative prices through alternative trading channels; to provide for national framework on agreements with AgriWood business firms, wood based industries (plywood and panel, paper and pulp, pencil making, woodcrafts, saw-millers etc.), wholesale depots, exporters or large retailers for farm services and sale future produce at a mutually agreed remunerative price framework in a fair and transparent manner; to provide for unhindered establishment and promotion of AgriWood based enterprises and for matters connected therewith or incidental thereto.

post-harvest processing technologies, etc. are issues demotivating the farming communities from further expansion.

- ♦ Because of lack of appropriate Laws, Acts, Rules and Regulations support, it remains unclear whether to place trees on farms under forestry laws or under agriculture laws, since the cultivation is largely on agricultural land. While, there are many schemes dealing with tree planting/ agroforestry, dedicated and focused laws, acts and rules & regulations along with an institutional mechanism for co-ordination and convergence among the schemes/ ministries to pursue agroforestry in a thematic manner are absent.
- Restrictions are being imposed by the Central and State Governments on harvesting and transportation of ToF produce, especially those species which are found growing in the nearby forests. These restrictions were basically designed to prevent pilferage from government forests. However, the rationale for such restrictions is not