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Teak

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INSTITUTE OF WOOD SCIENCE AND TECHNOLOGY, BENGALURU

Indian council of Forestry Research and Education

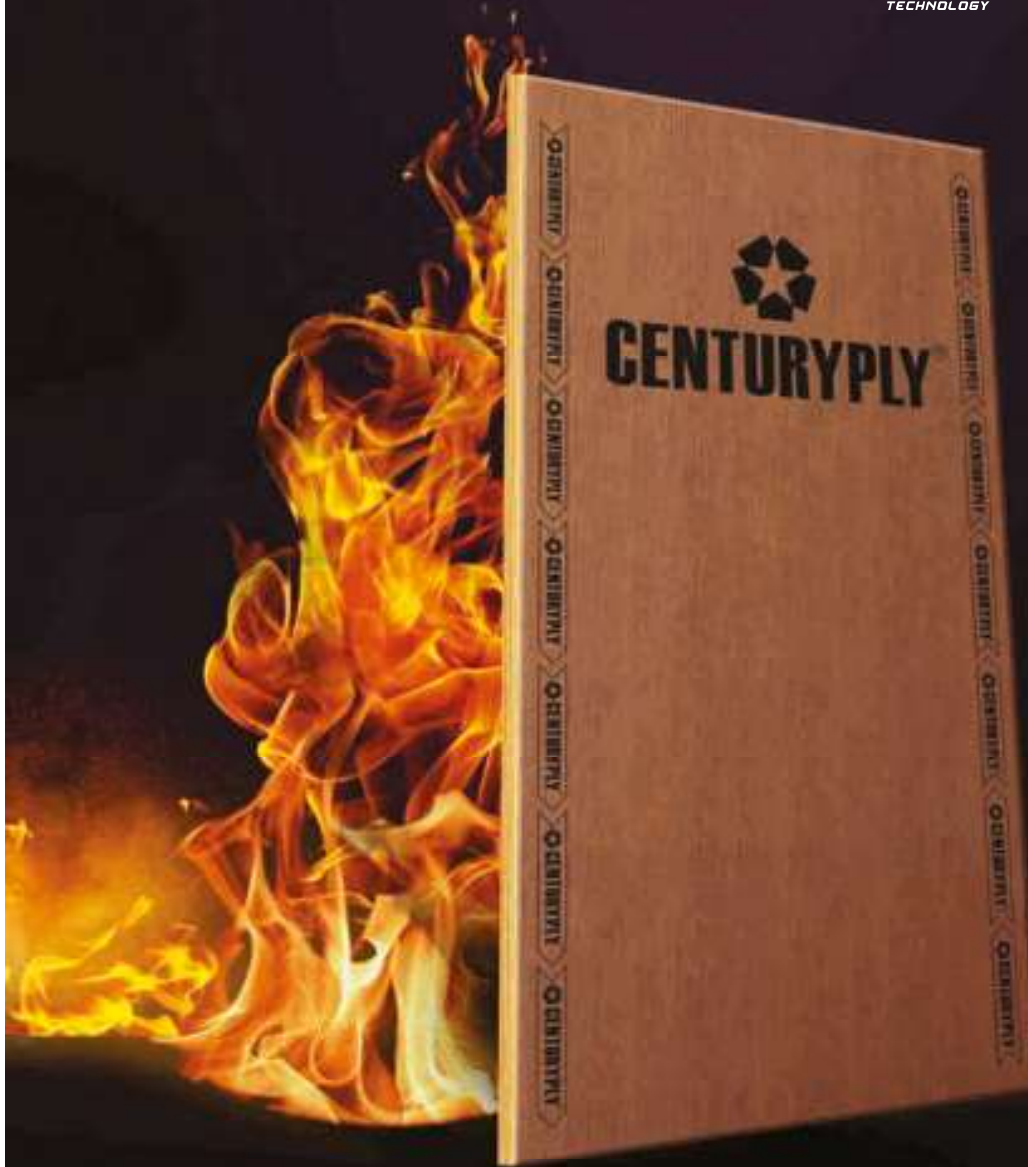
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(An Autonomous Council of Ministry of Environment Forest and Climate Change, Government of India)

VISION

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



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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 :

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FOREWORD

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Teak (*Tectona grandis*) is the most sought-after species in India for house construction and furniture making. Teakwood forms the bench mark for the grading and price of other wood species and traditionally, consumers in India have an exclusive preference for this wood. Teak is native to India, Myanmar, Laos, and Northern Thailand and there are nearly 8.9 million hectares of teak-bearing forests in India. It is ideally suited to grow as a plantation crop and also as agroforestry species by small holding farmers and is the most preferred species as a bund planting crop by the farmers in India.

India is a timber deficient country and on an average India has imported around 1 million Cubic Metres of teak wood annually during 2015 to 2019. The domestic harvest of teak is insignificant 50 thousand Cubic Metres. There are wood based industries looking for sustainable supply of teakwood for furniture manufacture and export and private investors are keen to develop large scale teak plantation.

There is an imminent need to make concerted efforts at every level in mission mode to improve research, cultivation, harvesting, and marketing of teak. It is the apt time to initiate the process of augmenting teakwood in India so that by 2047, on the 100th year of Independence, the country is self-sufficient in teakwood production. In this current issue of 'Wood is Good: Grow more. Use more' a popular quarterly magazine published from Institute of Wood Science and Technology (IWST), the focus is on various aspects related to Teakwood. The articles cover a wide variety of information related to teak and the steps that should be taken to popularise and expand the cultivation of teakwood.

With best wishes.

Date: 06.09.2022

(Bhupender Yadav)



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Director
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Preface

Teak (*Tectona grandis*) is one of the most popular and prominent timber species of India. Teakwood is known across the globe for its remarkable physical and mechanical properties and does not need an elaborative introduction. Its aesthetic and structural qualities are unparalleled, and its utility ranges from its use in carving, veneers, furniture and diversified uses like ship building. Hence, teak enjoys a worldwide reputation as one of the best quality timbers. With the booming economy and rapid urbanization, the demand for its use is increasing rapidly in India as well as the global market.

Teak is indigenous to India and is distributed in very large areas of natural teak bearing forests (8.90 million ha) and teak plantations (1.5 million ha). India alone accounts for 43% of global area covered under teak. Paradoxically, India alone is importing three quarters (74 per cent) of the total global trade volume of teak from more than 50 countries. Considering its popularity and demand, presently, teak is being extensively grown only for export purposes in some of the African and South American countries, which are not the areas in which teak has been found naturally.

In India, the teakwood produced from the natural resources has failed to fulfill the demand for teakwood. Significant decline in teak timber production in India could be attributed to strict implementation of forest conservation policies like blanket ban on green felling of trees, and timber transit rules implemented by some of the governments of the states where teak is abundant. Rigid regulations controlling the felling of teak trees and transit of timber discouraged the farmers to grow teak as agroforestry species that ultimately forced India to rely upon the import of teak from other countries.

Considering the present state of affairs with respect to augmenting teak production in India, Institute of Wood Science and Technology (IWST), Bangalore organized a two day national seminar on "Augmenting Teak Timber in India: Way Forward" by inviting representatives from state forest departments of teak growing states, industry representatives, scientists and academicians. The objective of the seminar was to come up with clear road map to augment teak production as India steps towards Atmanirbhar Bharat in terms of teak production by 2047. From the discussions held during the seminar it is learnt that, although some of the state forest departments are doing their bit to promote teak cultivation, states have not given adequate attention to this issue. State forest departments do not have a holistic plan to make India a self-reliant country in terms of teak production.

In a way, teak had its share of glory and agony in equal proportions. Now, the time has arrived to regain the lost glory of Indian teakwood both in the national and international market. As envisaged by the Hon'ble Prime minister of India, we are entering into the Amrit Kaal and we should try our best to achieve self-sufficiency in teakwood production by 2047 and reduce the massive import of teak wood in the short term. Time is now ripe to rethink about popularizing teak cultivation in India and also associated factors that need immediate attention to encourage teakwood farming. Teak being an indigenous tree, we are endowed with high genetic diversity of teak and it offers an ideal platform for identifying superior genotypes. Therefore, breeding strategies in genetic improvement of teak need greater focus, especially in terms of short rotation teak; and enhancing the options and opportunities for successful implementation of clonal forestry across the country, especially for the promotion of agroforestry and farm forestry plantations. State Forest Development Corporations have been granted forestlands for commercial plantations to meet the demands of the industries. They undertook plantation of *Eucalyptus*, *Acacia auriculiformis* and such other species suitable for paper and pulp industries. These plantations are competing with agroforestry plantations raised in small landholdings by local farmers in the supply of wood to industries, creating hardships and discouragement for farmers to undertake agroforestry. These forestlands leased to forest development corporations offer great opportunity for undertaking clonal teak forestry on lines of Latin American countries, especially Brazil. Further, to keep our genetic diversity intact, we can promote seed based plantation in our natural teak bearing forest areas.

To make India "Atmanirbhar Bharat" (self-reliant India) in terms of teak production and to realize the dream of our Hon'ble Prime Minister, we need to promote teak cultivation in India on a Mission mode. In this endeavor, there is an urgent need to constitute a "Teak Task Force" (TTF) at the Government of India level that gets down to the nitty gritty of several aspects and becomes the fulcrum of the teak revolution in India. The TTF can act as a guiding force to all the state forest departments to make India self-reliant in terms of teak production by the end of 2047. Further, India should not only be sufficient in teak production to fulfil the demands and aspirations of every citizen seeking this valuable wood, but should also be able to mightily contribute to fulfilling global demand.



(Dr. M. P. Singh, IFS)
Director