Proceedings and Recommendations of National Workshop on

IMPORTANT TIMBER TREES OF INDIA

-Seeking solutions towards Country's timber deficit

9 – 10 February, 2017

Editors
C. Buvaneswaran
S. Senthilkumar
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INSTITUTE OF FOREST GENETICS AND TREE BREEDING

(Indian Council of Forestry Research and Education)

P.B. No. 1061, R.S. Puram

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TECHNICAL SESSIONS OF THE WORKSHOP

THEME I - DEMAND, SUPPLY AND IMPORTS
Chairman: Shri. A. C. Lakshmana. IFS Retd. Former Secretary to Govt. of Karnataka
Co-chairman: Shri. S. Senthilkumar, IFS, Head, FLUCC Division, IFGTB
Rapporteurs: P. Kathirvel, IFS, DCF and Dr.D.Thangamani, Scientist-C
THEME II - QUALITY SEED AND PLANTING STOCK PRODUCTION & AGROFORESTRY
Chairman: Dr. T. R. Manoharan, Forest Stewardship Council (FSC), New Delhi
Co-chairman: Dr. Masilamani, Professor & Former Director, NSRTC, Varanasi
Rapporteurs: Dr. S. Saravanan, Scientist-E and Dr. A. Vijayaraghvan, Scientist-E
THEME III - STATUS AND VALUE CHAIN ON TIMBER TREES
Chairman: Dr. B. Gurudev Singh, Scientist-G Retd & Former Group Co-ordinator (Research), IFGTB
Co-chairman: Dr. V. Mohan, Scientist-G, IFGTB
Rapporteurs: Dr. Maheswar M. Hegde, Scientist-E and R. Sumathi, R.O.
THEME IV -RESEARCH AND DEVELOPMENT
Chairman: Sh. Jagdesh Chader, IFS, CCF, Haryana
Co-chairman: Dr. R. Yasodha, Scientist-F and Head, Plant Biotechnology Division, IFGTB
Rapporteurs: Dr. N. Senthilkumar, Scientist-E and K. Shanthi, R.O.
PANEL DISCUSSION AND VALEDICTION
Chairman: Sh. R. S. Prashanth, IFS, Director, IFGTB
Chief Guest: Dr. B. Gurudev Singh, Scientist-G Retd.
Panelists
Sh. K. V. Lakshmana murthy, IFS CCF Rtd. Former Director, State Forest Research Institute, Kanpur
Sh. Jagdesh Chader, IFS, CCF, Haryana
Dr. T. R. Manoharan, Forest Stewardship Council (FSC), New Delhi
Shri. S. Senthilkumar, IFS, CCF and Head, FLUCC Division, IFGTB

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India has grown from a net exporter of timber to a net importer of timber in the recent past and the reported average annual growth of timber imports is 12%. These imports are growing fast to meet both the domestic demand and value added timber products for export. This change has happened in spite of the plantation technology for teak being developed first in India and Teak being raised as a plantation crop in India since 1842.. Today India accounts for some 75% of global teak imports. In terms of financial implications, India's annual imports of logs and wood products have increased from 500 million USD to 2.7 billion USD over the decades utilizing significant foreign exchange. This in turn makes negative impacts on exchequer of the country. Further, one survey reports that annual urban timber consumption alone will grow by almost 8.3 million m^3 in ten years time. In this scenario, as an attempt to enhance timber production to meet the Country's timber deficit and to minimize the need for timber import for domestic utilization, a National Workshop on "Important Timber Trees of India – seeking solutions towards Country's timber deficit" was organized by Institute of Forest Genetics and Tree Breeding (IFGTB), Coimbatore on 9-10 February, 2017. This workshop created a platform for discussing scientific and technical issues relating to cultivation of timber trees, increasing the domestic timber supply and also policy issues in support of promotion of timber trees. The proceedings and the recommendations of this National Workshop are presented as below.

Inaugural Programme

Sh. S. Senthilkumar IFS, Convenor of the Workshop and Head, Forestry, Land Use and Climate Change Division, IFGTB, Coimbatore welcomed the gatherings for the two days National workshop. Dr. S. Murugesan, Group co-ordinator (Research), IFGTB, Coimbatore presented an overview of the workshop. He informed the delegates that 40 papers were received for this Workshop covering the themes on a) Demand, supply and import scenarios, b) Status of timber production in various states, c) Research and Development

on Timber Trees. He also briefed that besides researchers and Forest officials, tree growers and NGOs are also participating to share their experiences and views towards enhancing timber production in the country. He mentioned that students community has also volunteered to be the participants to take home messages for finding solutions towards Country's timber deficit. Finally, he stressed that this Workshop is organized to draft valuable recommendations as outcome of this National workshop for enhancing indigenous timber supply in the country and thereby minimizing the need for import of timber.

Shri R.S. Prashanth IFS, Director, IFGTB, Coimbatore delivered the presidential address. He stressed that timber requirement has increased exponentially due to spurt in population and change towards consumer based lifestyle. He pointed out that the government is initiating programmes both at state and country levels for encouraging farmers to grow more trees and to increase the green cover. He pointed out that IFGTB has released varieties of casuarinas and eucalypts, which gives income in a short period. Similar research works are taken up for timber trees like Teak, Gmelina, Melia, Thespesia, Ailanthus, Cadamba, Mahagony and other tree species to develop new tree verities with higher productivity. This will help stakeholders / tree growers to get return in shortest period possible.

Dr. K. K. Suresh, Dean, Forest College and Research Institute, Mettupalayam delivered felicitation address, with a quote of "HEALTH OF THE FORESTS IS WEALTH OF THE NATION". He congratulated IFGTB for this needful workshop for encouraging farmers to serve the country with supply of good quality wood. He suggested the farmers to go for alternate timber yielding species like jack, neem, bamboo, acacia etc. He requested the corporate sectors, banking, insurance, forest department and researchers to work jointly to bring synergy in promotion of tree cultivation in the country.

Dr. T. R. Manoharan, Forest Stewardship Council (FSC) national representative for India in his felicitation address, emphasized the need for collective effort of various institutions in the country for increasing sustainable timber production to address the timber deficit. In the case of timber imports, there is a legitimate reason for India to address India's ecological footprint and to understand how Indian imports impact the forests and ecosystem services in countries where timber is being harvested. The solution is not just regulation alone, we should make use of relevant voluntary market based mechanisms to support the government policy objectives for forest conservation. While addressing, he stressed the importance of formulating a national policy wood use, in the context of increased awareness and capacities among the government institutions, private sector and civil society in forest conservation. He expressed

the concern on the challenges in front of the world against illegal logging, forest cover loss and land degradation. In his speech, necessity of agriculture and forest linkages to increase the forest cover and to meet the objectives of climate change agreements and sustainable development goals and to construct road map with new collaborative research project for greening India was stressed.

Shri. A.C. Lakshmana, IFS Rtd. Former Secretary of Government of Karnataka released the book titled "Status and Recent Researches on Important Timber Trees of India" and delivered the inaugural address. He informed the delegates that recent Paris agreement for Climate Change Mitigation, ratified by Government of India, is compelling us to afforest 50 lakh hectares of forest land to mitigate 275 crore tonnes of carbon. It is under these critical conditions we are meeting here at Coimbatore today. With fifty years of experience in forestry, he proposed a hypothesis F = E1, E2, E3 divided by E4. Where, F= forest of any design, E1=Economical gains, E2=Employment generation, E3=Ecological and environmental gains, E4=Rural poverty. This hypothesis depicts that when the forests flourish, prosperity also flourishes, when forests retreat, poverty gains hold. He also stressed the need for a coordinated efforts by research Institutes – National and States like IFGTB, Coimbatore; IWST, Bengaluru, Tropical Botanical Garden Research Institute (TBGRI), Trivandrum, Kerala Forest Research Institute (KFRI), Peechi and many Forest Department in selecting species – 6-12 species each institute- and focused works on standardization of nursery and plantation practices - production of quality seedlings. Establishment of nursery - make available enough planting stock, distributing only certified quality planting stock-based on habitat specificity. He informed the gathering that "Silvi-horticulture" approach has huge potential and as of today about 20,000 farmers are practicing silvi-horticulture in Hunsoor and Periyapatna taluks alone under "Aranya prothsahayojana" scheme of Government of Karnataka. He assured that if this kind of programme is extended in other parts of the country sincerely, this is bound to make India as a Timber Surplus Country. He concluded his address with a slogan "PLANT AND FLOURISH".

Dr. C. Buvaneswaran, Scientist-F and Organizing secretary, IFGTB, Coimbatore proposed the vote of thanks.

After the Inaugural Session, the technical sessions of the Workshop were organized. There were technical sessions on four themes *viz.* I) Demand, Supply and Imports, II) Quality Seed and Planting Stock Production & Agroforestry, III) Status and Value Chain on Timber Trees and IV) Research and Development. Finally, recommendations of various themes were discussed in Panel Discussion and the Workshop was concluded with Valedictory function.
Overall, there were four Lead talks and ten invited paper presentations. There were also 11 volunteered paper presentations relating to Research and

Development initiatives on timber trees. The Lead Talks were given by the following resource persons:

Lead talk 1: Dr. T. R. Manoharan, Forest Stewardship Council (FSC), New Delhi – "Timber trade and forest certification in India"

Lead talk 2: Dr. K. K. Suresh, Dean, Forest College and Research Institute, Mettupalayam - "Quality Planting Stock Production Towards Enhanced Timber Production"

Lead talk 3: Dr. K. T. Parthiban, Professor and Head, Department of Agroforestry, Forest College and Research Institute, Mettupalayam - "A Value Chain on Timber based Industrial Agroforestry – Constraints and Interventions"

Lead talk 4: Sh. Jagdish Chander, IFS, Chief Conservator of Forests, Community Forestry, Haryana, Panchkula – "Important Timber Species of Haryana- Their Status of Cultivation, Production, Supply System, Policy Issues and Constraints"

Ten invited paper presentations were delivered by the following resource persons:

1. Dr. P. Masilamani, Professor & Former Director, National Seed Research and Training Centre, Varanasi – "Quality Seed and Seedling Production in Important Timber Tree Species"
2. Dr. R. Anandalakshmi, Scientist-E & Head, Seed Technology Division, IFGTB, Coimbatore – "Quality Seed Production for timber trees of India - Current status and future strategies"
3. Sh. L. Chandrasekar, IFS, Chief Conservator of Forests, Palkkad, Kerala – "Production and Supply of Teak Timber in Kerala - Current and Future Scenario"
4. Dr. T. K. Kunhamu, Professor and Head, Department of Silviculture and Agroforesty, College of Forestry, Kerala Agricultural University, Thrissur – "An overview of trees outside forests in Kerala with focus on the timber sector"
5. Dr. K. Kumaran, Professor and Head, Department of Tree Breeding, Forest College and Research Institute, Mettupalayam - "Neem Timber – A Revisit"
6. Dr. D. Narasimhan, Associate Professor and Head, Centre for Floristic Research, Dept. of Botany, Madras Christian College, Tambaram - "Timber Resources of Tropical Dry Evergreen Forest"
7. Sh. D. Rajasekar, IFS, DCF, Department of Forests and Wildlife Preservation, Punjab. – "Important timber species of Punjab – Present status and future potential"

8. Dr. A. Balasubramanian, Professor and Head, Department of Silvicuture, Forest College and Research Institute, Mettupalayam – "Response of tree species to intensive silviculture"
9. Sh. R. Kannan, President, Palni Hills Conservation Council, Kodaikanal – "Experiences from the field in growing native timber trees at Palani Hills, part of Western Ghats in Tamil Nadu"
10. Sh. S. Senthilkumar, IFS, Chief Conservator of Forests and Head, Forestry, Land Use and Climate Change Division, IFGTB, Coimbatore – "Status of timber in Jammu and Kashmir State"

Volunteered paper presentations

- Dr. K. Rajendran, Associate Professor and Head, Department of Botany, Thiagarajar College, Madurai – "Influence of Bioinoculants on the Growth of *Adina cordifolia* (Roxb.) Hook.f. in Nursery Conditions"

- Dr. S. Radhakrishnan, Associate Professor, Department of Silvicuture, Forest College and Research Institute, Mettupalayam - "Growth Dynamics of *Acrocarpus Fraxinifolius* Under Irrigated Condition"

- Dr. P. Rajendran, Assistant Professor (Forestry), Agricultural College and Research Institute, Kudumiyanmalai - "Genetic variability and association studies in growth traits of *Thespesia populnea* (L. Sol. ex.Correa) in progeny evaluation trial in Tamil Nadu"

- Dr. C. Cinthia Fernandaz, Associate Professor, Forest College and Research Institute, Mettupalayam – "Tree Cultivation in Tamil Nadu – A SWOC (Strength, Weakness, Opportunities and Challenges) Analysis"

- Sh. R. P. Ganesan, B.E., Tree Grower, Hosur – "Tree growing and its challenges - A Farmer's Perspective"

- Sh. N. Krishnakumar, Ph.D scholar, Forest College and Research Institute, Mettupalayam – "Cultivation Technology For Sandalwood (*Santalum album* L.)"

- Dr. V. Mohan, Scientist-G, Forest Protection Division, IFGTB, Coimbatore – "Status of Beneficial Microbial Diversity in Teak Plantations of South India"

- Dr. C. Buvaneswaran, Scientist-F, Forestry, Land Use and Climate Change Division, IFGTB, Coimbatore – "Productivity Of Teak In Tamil Nadu – A Review"

- Sh. P. Subramaniyan, Research Fellow, IFGTB, Coimbatore - "Correlation coefficient analysis of germination and seed parameters in *Ailanthus excelsa* Roxb. : A Multi Purpose Tree species"
- Dr. C. Cinthia Fernandaz, Associate Professor, Forest College and Research Institute, Mettupalayam - Information and Communication Technology (ICT) for Enhancing Tree Cultivation in Tamil Nadu

- Dr. K. Panneer Selvam, Scientist-C, Biodiversity Division, IFGTB, Coimbatore – "*Acacia nilotica* for rural livelihood – A review"

Workshop deliberations

The delegates of the workshop presented their research works, reviews and recommendations during the deliberations. The key points of presentations are as below.

- Dr. T. R. Manoharan, Forest Stewardship Council (FSC), New Delhi in his lead talk concluded that 'Forest certification' is an opportunity rather than a challenge to promote India's international timber trade. Imports of timber continue to grow fast and therefore there is a legitimate requirement to introduce adequate due diligence system not only to demonstrate India's commitment to address legality and sustainability but also to support the efforts of the supplier countries to address deforestation and illegal logging. Many of these supplier countries are developing and least developed tropical countries. India's export markets for wood products are developed countries where the voluntary sustainability standards such as forest certification are well recognised. Forest certification assures market access of timber products from India to these markets besides other benefits.

- Dr. K. K. Suresh, Dean, Forest College and Research Institute, Mettupalayam emphasized that Good plant quality is the basis for tree planting success. High quality planting stocks will have a higher survival rate and faster growth in the field and in turn enables a farmer to harvest wood or tree products sooner, increasing the return on the farmer's investment. He informed that seedling quality has two main aspects. The first is the 'genetic quality' or the source of the seed. The second component of seedling quality is its 'physical quality' when it leaves the nursery. Improving genetic quality of seedlings requires a long term strategy of seed selection, while improving the

physical quality can be accomplished in just one or two seasons. He suggested to use a less rigorous, but non-destructive, index for assessing the seedling quality which is the 'sturdiness quotient', which compares height (in cm) over root collar diameter (in mm). A small quotient indicates a sturdy plant with a higher expected chance of survival, especially on windy or dry sites. A sturdiness quotient higher than 6 is undesirable. He recommended to develop 'SEEDLING CERTIFICATION STANDARDS FOR IMPORTANT TIMBER SPECIES' and to promote tree cultivation only through 'CERTIFIED NURSERIES'.

- Dr. P. Masilamani, Professor & Former Director, National Seed Research and Training Centre, Varanasi opined that 'Seed quality' is the first and foremost factor, which decides the success and viability of a tree plantation as an afforestation programme or for that matter, even a genetic improvement programme. Management of seed quality starts from the selection of plus trees continues through seed collection, extraction, processing, seed enhancement and storage. Each and every step has its own significance; this will guide the seeds men, to obtain seeds of high quality. Unlike Seed Testing Labs of Agriculture seeds, Tree seed testing laboratories in India are less in number and the number of seed samples analysed in various seed testing laboratories has been considerably low. However, desired level of perfection in tree seed testing has yet to be achieved. He suggested that all Tree seed laboratories should develop the "Standard Operation Procedure (SOP)" and "Quality Management handbook" to maintain the documentation on staff, training, reports, equipment etc. Similar to Legislations for Agriculture seeds sector, legislations in Forest tree seed sector need to be formulated and enacted. He informed that as per the Seed Bill 2004: Chapter III on Registration of kinds and varieties of seeds, etc., all the Horticulture nursery need to be registered. Such type of rules and regulations must be formulated for 'Forest nurseries'; this will help to improve the quality planting stock production in impotent timber species.

- Dr. R. Anandalakshmi, Scientist-E & Head, Seed Technology Division, IFGTB, Coimbatore emphasized that Seed Production Areas (SPAs) for fast growing native timber species need to be established on priority basis in order to ensure supply of quality seeds until seed orchards are in place and to match the pace of tree cultivation interest of farmers. Plantations of the State Forest Departments currently designated for Conservation purpose can be revisited and evaluated with the scientific support so as to convert them to seed production areas / seed orchards. Community seed orchards need to be established for decentralised supply of quality seeds so that new income

generation opportunities open up with peoples' participation. She concluded the talk with a quote "Good seed pays, it does not cost".

- Sh. L. Chandrasekar, IFS, Chief Conservator of Forests, Palkkad, Kerala informed that owing to its wide uses and its importance in Kerala, TEAK is the main timber species grown by the Kerala Forest Department. The total Plantation area under Kerala Forest Department is 1.5 lakh ha, which comes to 13.5% of the total forest area in the state. The teak in the plantations under the Kerala Forest Department is extracted during the thinning and final felling of the teak plantations. Teak plantations are thinned at various stages and the final felling is done at 50 years of age. Currently, about 17000 cubic meter of teak timber is extracted annually by Kerala Forest Department. However, the change in the approach of the department from production forestry to protection forestry is likely to further reduce the timber output from the department plantations. The price of various classes of teak timber has increased over the years. With economic growth of the country, the demand for timber will keep on increasing and the steady output can increase the cost of teak timber from department plantations in the years to come. The challenges in teak timber production in Kerala are wildlife damages the newly establishing plantations, decline in plantation productivity, site degradation in subsequent teak planting areas, lack of systematic budget provisions for establishment and management of teak plantations.

- Dr. T. K. Kunhamu, Professor and Head, Department of Silviculture and Agroforesty, College of Forestry, Kerala Agricultural University presented that the area under Trees Outside the Forests (TOF) in Kerala which is about 28.49 % of the state's geographical area, is more than the tree cover under the recorded forest area in the state (21%). Major portion of the TOF area in the state is occupied by coconut and rubber plantations. Other prominent tree growing sectors are arecanut, jack, coffee, mango, tea, nutmeg and teak. The wood demand in the state of Kerala was 22,28,000 m^3 roundwood and the supply trends showed that major share was from rubber (46.6%) followed by homegardens (35.3%) and imports (16.5%). while forests recorded a dismal proportion of 1.6% during 2010-11. He opined that responsible sourcing from certified forest may become mandatory while importing to India which may put restrictions on the import form many countries. Hence, there should be long term planning to start new wood sources or strengthening the production potential of the available sources. He concluded that concerted efforts are required for the expansion of tree cover in the TOF sector in the state, by having Some of the priority considerations like a) Development of policy frameworks and operation guidelines for implementing National Agroforestry Policy, 2014 with particular reference to TOF in Kerala, b) Institutional

mechanism for the development of TOF in the State, c) Establishment of tree grower's consortium for establishing proper linkage with wood based industries, d) Simplifying timber felling/transit rules e) Market intelligence about the tree produce for deriving maximum benefits to the tree growers, etc.

- Dr. K. Kumaran, Professor and Head, Department of Tree Breeding, Forest College and Research Institute, Mettupalayam informed that the total growing stock in the country is estimated to be 5768 million cubic meter comprising 4395 million cubic meter inside forest areas and 1573 million cubic meter outside recorded forest areas (TOF). The growing stock of *Azadirachta indica* is 7.31 % in total volume. Neem tree plantations produces a timber of 40 to 60 m^3 per ha in 12 years. Regarding neem wood as timber, more focussed research works to be taken up in collaboration with timber and plywood industries for effective promotion and utilization.

- Dr. D. Narasimhan, Associate Professor and Head, Centre for Floristic Research, Dept. of Botany, Madras Christian College emphasized that importance need to be given to the timber species mentioned in book on 'A Manual of Indian Timbers'-written by Gamble James Sylves. He stated that alternate timber sources is an essential today compared to the main timber species. This alternate timber resources are very much available in Tropical Dry Evergreen Forests and this can be a main strategy to meet out the increasing demand of timber. He said the strategies to conserve the species are both *ex-situ* conservation in Social forestry and Agroforestry and *in-situ* augmentation of population of Tropical Dry Evergreen Forests species.

- Dr. K. T. Parthiban, Professor and Head, Department of Agroforestry, Forest College and Research Institute, Mettupalayam briefed the forum regarding the demand and supply of timber in the country. He told that because of changes in national forest policies, production forestry has been converted into conservation forestry; therefore, the national timber need has to be met by agroforestry. Major part of the plywood material comes from farm sources and its utility varies depending upon wood density. Therefore, to meet the timber demand timber based agroforestry model should be developed. Precision silivicltures techniques need to be developed for production of quality timber in shorter rotation. He also told that many countries banned the timber export in log form; instead promote the export of value added products. He also put forth his recommendation that exemption of taxation on timber production, sales and transport from agroforestry sources and suggested use of Mahogany for timber industry which is currently being utilised for plywood industry also. He also insisted the forum to recommend to implement organised timber based

value chain model for better outcome and creation of consortium of farmers, research institutes, nurseries and timber industries.

- Sh. Jagdish Chander, IFS, Chief Conservator of Forests, Community Forestry, Haryana, Panchkula informed that Haryana has become an agroforestry state, almost all timber produced is from agroforestry. Majority timber plantations include eucalyptus (40%), poplar (20%), *Dalbergia sissoo*, red cidar (deodar), *Melia composita*, *Acacia nilotica*, and *Ailanthus excelsa*. He stated that *Dalbergia sissoo* is vanishing due to die back caused by *Ganoderma* and other fungal root rot. Trees are drying out due to this disease everywhere. *Melia dubia* is being introduced during 2000 but it is not a successful agroforestry model in Haryana. He also said that there is no timber trnasit rule in Haryana as lot of timber from adjacent states move in affecting timber glut and thereby timber prices . India's biggest plywood market is located at Haryana. Because of planting very few clones of eucalyptus and poplars some species and clone specific dieses are prevalent. "Monoculture within monoculture" should be avoided. Along with diversification of species for planting, genetic material for planting within a species should also be diversified.

- Sh. D. Rajasekar, IFS briefed about the forest in Punjab and he told that Punjab state main aim is to increase the forest cover to a minimum of 10% in coming 20 years period. *Acacia catechu,* eucalyptus, poplar and shisham are the major trees species planted in Punjab. He told that Shisham is a sacred tree planted near Gurdwaras and it is second most important tree next to teak in terms of timber quality. Currently, *Melia azedarach,* timber species is being planted extensively in Punjab. He stated that 70% of timber demand is being met through plantation forestry and TOF. A good collaboration is required among research institutes, farmers and State Forest departments in developing good technology for timber production.

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- Dr. A. Balasubramanian, Professor and Head, Department of Silvicuture, Forest College and Research Institute, Mettupalayam shared his research experience in intensive silviculture practices which increased the productivity and total biomass. He also added *Dalberzia sissoo* is a multipurpose tree provides fodder in lean season. He emphasized the need for developing species specific precision silviculture models like it is available in Agriculture or Horticulture.

- Shri. .R. Kannan, President, Palni Hills Conservation Council, Kodaikanal informed that two and a half decades of tree growing efforts of this Council that have provided many tree growers with their own wood for making furniture door and window frames , for own use and for sale as well. He

detailed the path of production of quality seedlings in nursery and success of plantations which include proper species selection, provenance matching, timely pruning, matching soil and species and planting techniques and species selection for urban and house hold planting. He also stated that *Grewia tiliaefolia* and *Dalbergia latifolia* performed better when planted in coconut farm. The heartwood formation was at early age indicating the old belief of rose wood being very long rotation species (100-120 years) is disapproved. His expressed that India once provided lumber for ships that sailed the oceans and helped open new worlds (the Americas) for the Europeans. Sadly today we have to import timber for meeting the needs of urban markets. If concerted efforts are made to grow trees from farmland along with regular crops then once again the land will provide lumber for the India's own needs as well as for worlds needs.

- Sh. S. Senthillkumar, IFS, Chief Conservator of Forests and Head, Forestry, Land Use and Climate Change Division, IFGTB detailed the status of timber in Jammu and Kashmir. He stated that felling of trees in natural forests is restricted by rules. Being cold region J&K is a heavy consumer of wood. Wood is heavily used in traditional house construction. Even warmer parts of Jammu started following construction of Kashmiri type houses. The natural forests are degenerating fast and wood supply getting dwindled. Demand is met mainly through import. Felling and transit from forest is difficult. He also informed that wood from import reaches via Gujarat ports, from there it is transported by road to J&K. The state has scarce agricultural land resource which can be diverted for the privately growing Timber yielding trees. The state is largely dependent on imported timber. The scope of raising sufficient quantity of timber in the state is also not feasible. The state has enacted acts to regulate the felling of trees and transit of timber which has effectively curtailed illegal smuggling. This has resulted in the demand for timber from outside the state.

- In the Session on Research and Development, volunteered papers were presented. The key research areas suggested by the speakers were: a) indigenous tree species such as Thespesia, Ailanthus, teak, sandal and *Acacia nilotica* need to be studied, b) all timber tree species need productivity model like teak productivity model as developed by IFGTB, c) Intensive silviculture practices for timber trees to be standardized, d) Information/data on market, pest and diseases is needed for adoption Information and Communication Technology (ICT) for Enhancing Tree Cultivation, e) Timber development board is needed for promotion of tree cultivation, f) studies on species specific bio-inoculants and bio-fertilizers for enhancing productivity need to be carried out.

PANEL DISCUSSION AND VALEDICTION

The recommendations drawn during the presentations and lead lectures of each theme were presented by rapporteurs of the respective sessions – I) Dr. D. Thangamani, Scientist-C, II) Dr. S. Saravanan, Scientist-E, III) Dr. Maheswar M. Hegde, Scientist-E and IV) Dr. N. Senthilkumar, Scientist-E. Suggestions on recommendations were also invited from the participants. The valedictory address was given the Chief guest Dr. B. Gurudev Singh, Scientist-G Rtd. In his valedictory address, he informed that 30000 crore rupees worth of timber is being imported to India of which 10000 crores rupees worth is teak. Farmers are ready to grow teak, it is the duty of R&D institutions like IFGTB has to provide proper planting material. Another important aspect is clonal material with short rotation. Teak is worth investing in India. Consortia have to be established to link farmers, industry and R&D institutions. Other important trees to be focused are sandal, rosewood, red sanders. Lesser known trees species like Acacia, Gmelina, Mahogany, Khaya are to be explored for its timber values in order to meet the timber deficit of India. The workshop ended with the formal vote of thanks by Sri. S. Senthilkumar, IFS, Chief Conservator of Forests and Head, Forestry, Land Use and Climate Change Division, IFGTB. The following key recommendations were drawn for further needful actions towards meeting the future demand on timber through MAKE IN INDIA timber supply chain.

RECOMMENDATIONS

- Promotion of agroforestry systems with indigenous timber species which are economically viable and socially acceptable and supported with Government initiatives and incentives.

- Import of timber continues to grow fast in India and therefore there is a legitimate requirement to introduce adequate due diligence system not only to demonstrate India's commitment to address legality and sustainability but also to support the efforts of the supplier countries to address deforestation and illegal logging.

- Seed Production Areas and Community Seed Orchards for fast growing native timber species need to be established on priority basis in order to ensure supply of quality seeds to match the pace of tree cultivation interest of farmers.

- Similar to Legislations for Agriculture seeds sector, Legislations in Forest Tree Seed Sector need to be formulated and enacted.

- There is an imperative need to develop 'Seedling Certification Standards for Important Timber Species' and to promote tree cultivation only through 'Certified Nurseries'.

- Institutional mechanism to be set up for the development of Trees Outside the Forests in each State and tree grower's consortium need to be established for proper linkage with wood based industries.

- Data on potential timber yield and economics of cultivation of important tree species need to be made available across varied site conditions and management regimes and also the market intelligence about the tree produce need to be in place for deriving maximum benefits to the tree growers.

- Framing and implementing of Simplified and Nation-wide uniform Timber felling / Transit rules is the need of the hour to facilitate and encourage tree cultivation in the country.

- Alternate timber resources need to be explored using timber resources available in natural forests like in Tropical Dry Evergreen Forests and this can be a main strategy to meet out the increasing demand of timber.

- Clonal Forestry along with Precision Siliviculture techniques need to be developed for production of quality timber in shorter rotation. Species specific bio-inoculants and bio-fertilizers need to be developed for enhancing productivity of timber trees.

- Exemption of taxation on timber production, sales and transport from Agroforestry sources may be considered.

- Organised timber based value chain model for better outcome and creation of consortium of farmers, research institutes, nurseries and timber industries need to be implemented.

- Creation of "Timber Development Board" is needed for promotion of tree cultivation and enhancing indigenous timber supply and thereby minimizing the timber import needs.

LIST OF CONTRIBUTORS

NATIONAL WORKSHOP ON IMPORTANT TIMBER TREES OF INDIA

-Seeking solutions towards Country's timber deficit

9-10 FEBRUARY 2017

	Name	Address
1.	Sh. A. C. Lakshmana, IFS	PCCF & Secretary (Forests) Rtd. No. 1, 7th Main, Gokulam 3rd Stage, MYSORE- 570002. aclakshmana@yahoo.com
2.	Dr. T. R. Manoharan	FSC National Representative for India Forest Stewardship Council (FSC) B3/26, Second Floor, Janakpuri, New Delhi-110058. manoharan7@gmail.com
3.	Dr. K. T. Parthiban	Professor & Head, Department of Agroforestry, Forest College and Research Institute, Mettupalayam-641301 ktparthi2001@gmail.com
4.	Sh. Raman Nautiyal	Scientist and Head, Division of Forestry Statistics, Indian Council of Forestry Research and Education, P.O. New Forest, Dehra Dun-248006. nautiyalr@icfre.org
5.	Sh. Dhruv Sood	Office of Agricultural Affairs American Consulate General C-49, G Block, Bandra Kurla Complex, Mumbai 400051. agmumbai@fas.usda.gov
6.	Dr. R.Anandalakshmi	Scientist & Head, Seed Technology Division, Institute of Forest Genetics & Tree Breeding, P.B. No. 1061, Coimbatore-641002. lakshmir@icfre.org
7.	Dr. P. Masilamani	Professor (Seed Technology), (Former Director, National Seed Research And Training Centre, GOI, Varanasi, UP), Agricultural Engineering College & Research Institute, Pallapuram Post, Kumulur, Trichy - 621712. masil_mahesh@yahoo.com

8.	Dr. K. K. Suresh	Professor and Dean, Forest College and Research Institute, Mettupalayam-641301. deanformtp@tnau.ac.in
9.	Dr. A. K. Handa	Principal Scientist, ICAR-Central Agroforestry Research Institute, Jhansi (U.P)-284002. orgsec@gmail.com
10.	Dr. D. Narasimhan	Associate Professor & Head, Centre for Floristic Research, Dept. of Botany, Madras Christian College, Tambaram, Chennai- 600 059. narasimhand@gmail.com
11.	Dr. I. Jaisankar	Principal Scientist, ICAR- Central Island Agricultural Research Institute, Port Blair, Andaman and Nicobar Islands - 744 105. ijaisankar@yahoo.com
12.	Dr. T. K. Kunhamu	Professor and Head, Department of Silviculture and Agroforesty, College of Forestry, Kerala Agricultural University, KAU P.O, Vellanikkara, Thrissur 680656 kunhamutk@gmail.com
13.	Sh. Jagdesh Chander, IFS	Chief Conservator of Forests, Community Forestry, Haryana, Panchkula. jagdish.chander@hotmail.com
14.	Sh. L. Chandrasekar, IFS	Chief Conservator of Forests, Palkkad, Kerala chandrasekarl@yahoo.com
15.	Sh. S. Senthilkumar, IFS	Chief Conservator of Forests and Head, Forestry, Land Use and Climate Change Division, Institute of Forest Genetics and Tree Breeding, Coimbatore-641002. s.senthilkumar.ifs@gmail.com
16.	Sh. D. Rajasekar, IFS	DCF, Department of Forests and Wildlife Preservation, Forest Complex, Sector 68, Mohali, Punjab. rajasekar.ifs@gmail.com

17.	Dr. K. Kumaran	Professor & Head, Department of Tree Breeding, Forest College and Research Institute, Mettupalayam-641301 kumaran.k@tnau.ac.in
18.	Dr. Ranjana Arya	Scientist-G, Arid Forest Research Institute, P.O. Krishi Mandi, New Pali Road, Jodhpur. rarya@icfre.org
19.	Sh. R. Kannan	President, Palni Hills Conservation Council Endhawin, Lower Shola Road, Kodaikanal – 624101. kannan58@zoho.com
20.	Sh. Ganesan, R. P.	H-96, New ASIL Hudco, Hosur-635109. ganesanrp@gmail.com
21.	Dr. Manmohan J.R. Dobriyal	Professor, College of Forestry, Navsari Agricultural University,Navsari, Gujarat. manmohandobriyal@gmail.com
22.	Dr. K. Panneerselvam	Scientist-C, Institute of Forest Genetics and Tree Breeding, Coimbatore-641002.
23.	Dr. C. N. Hari Prasath	Senior Research Fellow (SRF), Department of Silviculture, Forest College and Research Institute, Mettupalayam-641301. prasathforestry@gmail.com
24.	Dr. S. K. Singh, IFS	CCF, Research (Retd), Presently Consultant, JICA Project, Uttarakhand. sksingh2015@yahoo.com
25.	Dr. V. Mohan	Scientist-G, Institute of Forest Genetics and Tree Breeding, Coimbatore-641002. mohan@icfre.org
26.	Dr. C. Buvaneswarn	Scientist-F, Institute of Forest Genetics and Tree Breeding, Coimbatore-641002. cbuvanes@gmail.com
27.	Miss.M. Sangareswari	Ph. D. scholar, Forest College and Research Institute, Mettupalayam-641301. vivehasangari@gmail.com

28.	Dr. P. Rajendran	Associate Professor, Forest College and Research Institute, Mettupalayam-641301. rajendranforestry@gmail.com
29.	Dr. C. Cinthia Fernandaz	Associate Professor, Forest College and Research Institute, Mettupalayam-641301. cinthia.tnau@gmail.com
30.	Sh. Vikas Kumar	Ph. D. Scholar, College of Forestry, Kerala Agricultural University, KAU P.O, Vellanikkara, Thrissur 680656 vkskumar49@gmail.com
31.	Dr. K. Rajendran	Associate Professor and Head, Department of Botany, Thiagarajar College, Madurai=625009. kuppurajendran@rediffmail.com
32.	Dr. A. Balasubramanian	Professor & Head, Department of Silviculture, Forest College and Research Institute, Mettupalayam-641301. balayzz@yahoo.com
33.	Dr. S. Radhakrishnan	Associate Professor, Department of Silviculture, Forest College and Research Institute, Mettupalayam-641301. drsradhakrishnan@gmail.com
34.	Sh. N. Krishnakumar	Ph. D. scholar, Forest College and Research Institute, Mettupalayam-641301. krishna.forest@gmail.com
35.	Dr. S. Manivasakan	Associate Professor, Department of Silviculture, Forest College and Research Institute, Mettupalayam-641301. smanivasakan@yahoo.co.in
36.	Dr. S. Vennila	Associate Professor, Forest College and Research Institute, Mettupalayam-641301. venkanika@gmail.com
37.	Dr. D. Rajasugunasekar	Scientist-E, Institute of Forest Genetics and Tree Breeding, Coimbatore-641002. sekardrs@icfre.org

Welcome Address by Sh. S. Senthilkumar, IFS, CCF and Head, Forestry, Land Use and Climate Change Division, IFGTB, Coimbatore

Overview of the Workshop presented by Dr. S. Murugesan, Scientist-G and Group Co-ordinator (Research), IFGTB, Coimbatore.

Presidential Address by Sh. R. S. Prashanth, IFS, Director, IFGTB, Coimbatore.

Felicitation Address by Dr. K. K. Suresh, Dean, Forest College and Research Institute, Mettupalayam

Felicitation Address delivered by Dr. T. R. Manoharan, Forest Stewardship Council (FSC), New Delhi.

Releasing of Book titled "Status and Recent Researches on Important Timber Trees of India"

Inaugural Address by Sh. A. C. Lakshmana, IFS, Rtd. Former Secretary of Government of Karnataka.

Vote of Thanks proposed by Dr. C. Buvaneswaran, Scientist-F and Organizing Secretary of the Workshop.

Participants of the National Workshop on Important Timber Trees of India held on 9-10 February 2017 at IFGTB, Coimbatore

Valedictory Address by Dr. B. Gurudev Singh, Scientist-G Rtd.