Volume: 5 Issue: 4

October 2012

INSIDE THIS ISSUE

Editorial

In the course of its development, TEAKNET has gained substance both in its theme and scope an example of which is the tie-up achieved with OLAT (Latin America Teak Organization). OLAT is an organization of teak growers in South America aiming mainly to fetch fair price for teak timber for the sake of its members. OLAT is organizing yet another conference since its last meeting in Costa Rica. This time, it is in Cuiabá, MT, Brazil. The readers can find the details of this programme in this bulletin and also in the OLAT website (http://www.olatgroup.com/en)

Another significant achievement that TEAKNET has cornered is the establishment of a TEAKNET focal point in Africa. Forestry Research Institute of Ghana (FORIG), Kumasi came forward to take up this task. TEAKNET is presently having correspondence with the officials of FORIG to initiate a grand programme for R &D works on teak in the region with emphasis to Ghana.

Arrangements for the World Teak Conference in Thailand are in full swing. Other than the plenary papers, invited lectures and group discussions, the conference offers space for poster presentations. The potential participants are urged to submit their abstracts before the deadline. The last date for submission of abstracts has been extended to 21st of October 2012. The most important part of this conference would be the opportunity created for assembling different groups of stakeholders of teak sector for mutual interactions.

Dr. Balasundaran and his group in Kerala Forest Research Institute, Peechi, India have come up with some important findings with regard to genetic variability of teak trees in Southern India. On request, he has kindly given a short account of his paper published in *Conservation Genetics*.

Of late, the Proceedings of the conference on Art & Joy of Wood held in Bangalore during 19 -22 October 2011 has been hosted in the website http://www.fao.org/docrep/016/ap001e/ap001e00.htm or http://www.fao.org/docrep/016/ap001e/ap001e.pdf by the organizers. The document contains very useful and interesting bunch of information.

The readers are urged to have a look at the Facebook entry of TEAKNET which is updated on a regular basis.

Dr. K. Vishnu Bhat, Senior Scientist of Kerala Forest Research Institute has retired from the service of KFRI on superannuation. He has been a member of the Editorial Committee of the Teaknet Bulletin and a staunch supporter of Teaknet by way of his contributions in editing several of Teaknet publications.

It is also informed that TEAKNET would bring out its first Occasional Paper on teak. An executive summary of this paper is included in this bulletin.

With Season's Greetings,

K. Jayaraman,
TEAKNET Coordinator

Forestry Research Institute of Ghana

Forestry Research Institute of Ghana is one of the 13 institutes of the Council for Scientific and Industrial Research (CSIR). It is located at Fumesua near Kumasi in the Ashanti Region of Ghana. It started as a research unit within the Forestry Department in 1962. It was fully established as a research institute and named Forest Products Research Institute (FPRI) under the then Ghana Academy of Sciences in 1964 and in 1968 placed under the Council for Scientific and Industrial Research (CSIR). By Act of Parliament (Act 405) the Institute was transferred from the CSIR to the Forestry Commission in 1980. In 1991, the name of the Institute was changed to Forestry Research Institute of Ghana to reflect the widening scope of its research activities. In 1993, by another Act of Parliament (Act 453) the Institute was reverted to the CSIR.

12th and 13th of November 2012

Cuiabá, MT - Brazil

2º Congresso Internacional da OLAT

ORGANIZAÇÃO LATINO-AMERICANA DE TECA

Due to the new distribution of the event's schedule, there won't be any activities on November 14th. Therefore, our schedule will remain restricted to November 12th and 13th. The new schedule is already available on the event's site.

We will shortly inform you details about registration for the Congress and Technical Spin.

The event has the goal of promoting, encouraging and discussing plans for the production of teak with quality, competitiveness within the precepts of sustainability to continually meaningfully develop the prime tropical timber market and to bring better opportunities for businesses.

For more information see:

www.congressoolat.com.br

Presented by: OLAT AREFLORESTA

Support: FAMAD

Sponsor: verde novo

Role of teak in meeting the global hardwood crisis

(Executive Summary of TEAKNET Occasional Paper No.1)

Kadiroo Jayaraman[1] and Lars Graudal[2]

[1]TEAKNET Coordinator, Kerala Forest Research Institute, Peechi, Kerala, India

[2]Head of Division, Forest Genetic Resources
University of Copenhagen, Forest & Landscape Denmark, Frederiksberg, Denmark

In the context of worldwide depletion of forest resources, many countries took to forest conservation, sustainable forest management and timber certification leading to reduced supply of hardwoods. Coupled with the high demand for such woods, the gap between production and consumption grew disproportionately which almost led to a crisis. An International Workshop on 'production and marketing of teak wood' conducted in November 2009 at the Kerala Forest Research Institute, Peechi India drew attention to this crisis of high grade tropical hardwoods, which is expected to grow further in the coming years. The global demand for tropical hardwoods is estimated to be 136 million m^3 by 2050. This paper examines the current international situation with respect to the origin, magnitude and solutions to this crisis.

Considering the most important roles natural forests play in conserving biodiversity, sequestering carbon, providing other environmental benefits, it is not wise to look upon natural forests as a commercial entity in many parts of the world. Instead, planted forests are looked upon as an important source of hardwood supply. As natural forest timber becomes increasingly scarce in the coming decades, high-grade hardwood plantations are likely to come under increasing pressure to provide their harvests earlier than planned, which will further endanger supply. The most realistic solution to ensure sustainable tropical hardwood supplies in the long-term future is to create a large production estate made up of new plantations with accompanying natural managed forests.

In the above context, one natural question would be to ask as to which species of hardwood could be recommended to be promoted as a suitable one to overcome the crisis. Considering the veritable features of the species, it is proposed that teak would have a major role. Teak can be grown in the entire tropical belt and sometimes in the subtropical region as well. It is not hard to find new homes for teak considering its wide adaptability.

Growing corporate and smallholder investments in teak plantations are a clear indication of the perceived potential of the species, which will form an increasingly important source of future valuable hardwood supply and contribute considerably towards reducing deforestation and forest degradation and thus supporting REDD+ objectives. Although the ownership of planted forests largely remains with public sector, private initiatives have sprung up in many countries involving both corporate and small holder communities.

Teak (*Tectona grandis* L.f.) is a versatile timber known for its quality, durability and strength. It is used largely in furniture industry and construction of buildings, ship and boat making, for veneer and as poles. Teak is an undisputed leader of high value tropical timbers. It is always referred to as standard timber for comparative evaluation of quality and utilization potential of other tropical hardwoods. Teak is being grown in plantations in more than 60 tropical countries across the globe although its natural occurrence is limited to India, Laos, Myanmar and Thailand.

The reported growth rates of planted teak are contentious. Many growth predictions continue to appear on the internet and in literature, predicting very high growth rates above 20 m^3/ha/yr. The actual long-term productivity of planted teak has, however, often turned out lower than predicted. Teak is not a fast growing species *per se*. Its growth performance depends on the quality of the planting material and the best management practices. The mean annual increment reported by 26 countries appears rather modest and lies, for most regions, between 2 and 14 m^3/ha/yr, except for some high-intensity investment schemes in Central and South America (Kollert and Cherubini, 2012). The growth rate however varies widely depending up on suitability of soil and post-planting care given.

Read more on page 4

Continued from page 3

Calculations show that even with moderate management in good sites, teak plantations fetch 30 per cent internal rate of return on the investments in the long run. However, the IRR will vary with growth rate, input costs and proximity to the market or port of shipment. Many other plantation crops like tea and coffee face problems due to price fluctuations in the international market. These crops are labour intensive and require constant care and high input management whereas the case of teak plantations is just the opposite.

A number of studies have been carried out on the potential returns on investment in teak plantations. Such calculations rely heavily on assumptions concerning growth rates, costs and timber prices, on which reliable data are scarce. The following may be quoted: A study of teak plantations in Costa Rica (de Camino and Alfaro 1998) quoted an internal rate of return (IRR) of 12 per cent where MAI was assumed to be 15 m^3/ha/yr and rotation 25 years. An analysis of different assumptions of MAI, rotation length, price and costs showed the sensitivity of IRR to these factors, and emphasized the importance of reliable estimates. A similar IRR for teak of 14-15 per cent was quoted for Papua New Guinea (Hammond, 1998).

If the figures used in the calculation of economic and financial returns quoted above are reliable, especially as they concern price, the results confirm that the decisions made by investors, especially by smallholders, for the establishment of teak plantations appear to be soundly based. The lack of reliable data on present costs and (especially) on future prices, however, must sound a cautionary note against optimistic extrapolation of economic returns.

The global teak market has been and will continue to be governed by trends in the Asian market. Asia holds more than 90 per cent of the world's teak resources and India alone manages 38 per cent of the world's planted teak forests. The high international demand for general utility teak has broadened the traditional teak supply base from natural forests in Asia to include fast-grown, small-diameter plantation logs from Africa and Latin America. Planted teak forests have attracted large investments from the private sector in Africa, Asia and Latin America. Globally, they constitute the only planted hardwood resource that is increasing in terms of area (Kollert and Cherubini, 2012)

Teak has maintained its unique position among tropical hardwood species thanks to its inherent qualities of strength, durability, workability and appearance. With plantations becoming an important source of supply of teak wood, the quality of wood from plantations *vis-à-vis* that from natural forests and long-rotation plantations is a key concern. Developments in processing technologies have enabled the use of small-dimension logs and even sapwood (Sangkul 1998).

A review on teak prices (Jayaraman, 2011) indicated that the highest prices (up to 2000 USD/m^3) were achieved by naturally grown logs from Myanmar, which could be processed into veneers, while thinned logs (from rapidly expanding plantations) such as those so far exported from Central America are placed in the lowest price category and yield prices of about 200 USD/m^3. The apparent cumulative difference in various wood properties between natural and plantation grown teak, coupled with the much smaller dimensions offered by the latter, seems to have established the fact that plantation teak wood is no match for mature-aged natural teak in the market place. New market avenues need to be explored and developed for plantation grown teak products, which produce less mature wood but with less defects due to intensive management practices with the ecological and sustainable production label.

Other than technical and financial requirements, adequate policy and legal support is a prerequisite for any major investments in planting programmes. As regards teak, the general atmosphere the world over has been promotional rather than restrictive. A number of Governments including China and India remain active participants in plantation establishment and management. In other words, Governments have dissolved their commercial forestry interest by privatizing plantations (Chandrasekharan, 2005).

Read more on page 5

Continued from page 4

The current global supply trend points to a continuing decline in the volume and quality of natural teak and it is imperative to initiate a program for the conservation of natural teak forests if the genetic resources of natural teak are to be sustained. Considering the flexibility of the plantation programmes, planted forests are suggested as an alternative to meet the projected supply deficits. Globally, planted teak forests constitute the only planted hardwood resource that is increasing in terms of area.

While promoting plantations in our anxiety to boost production, the importance of sustainable management should not be forgotten. It is possible that plantations which are mismanaged lead to site deterioration and other environmental problems. Similarly, public-owned plantations are likely to be subjected to unauthorized logging in many countries. In this respect, the best arrangement would be participatory forest management such as practiced in Thailand and other countries. Furthermore, synergistic opportunities for improved livelihoods and conservation may be considered in connection with the development of intensive industrial plantations. The socio-cultural and political dimensions too need be explored for many a time socio-political constraints hinder achieving optimal returns from various "participatory" arrangements (Anitha 2012 -Personal Communication).

More holistic research efforts are called for, leading to sustainable management of teak forests and plantations especially as new problems and issues emerge. Future research efforts will be driven by the need to adopt sustainable forest management coupled with changes in markets and utilization technologies. Enhanced productivity of planted teak forests and an improved marketing system for teak wood would greatly facilitate bringing down the production crisis.

However, the escalating demand for the product can be met only by increasing the production substantially by expansion of the area under teak. This calls for much private initiative coupled with adequate governmental support and legal framework.

References

Anitha, V. 2012. Personal Communication from Dr. Anitha. V., Scientist, Kerala Forest Research Institute, Peechi, Kerala, India.

Chandrasekharan, C. 2005. Qualities of teak and some policy issues *In:* Bhat, K.M., Nair, K.K.N., Bhat, K.V., Muralidharan, E.M. and Sharma, J.K. (eds.), *Quality Timber Products of Teak from Sustainable Forest Management*, Proceedings of the International Conference, 2-5 December 2003, Kerala Forest Research Institute, Peechi, India. pp.219-227.

De Camino, R. and Alfaro, M.M. 1998. Teak (*Tectona grandis*) in Central America. Report to the FAO project GCP/INT/628/UK

Hammond, D. 1998. Hardwood programmes in Fiji, Solomon Islands and Papua New Guinea. Report to the FAO project GCP/INT/628/UK.

Jayaraman,K. 2011. Teak - A potential species to meet the global hardwood crisis. Presented at the International Teak Conference: Planted teak forests - a Globally Emerging Forest Resource, San José, Costa Rica. 31 October - 3 November, 2011

Kollert, W. and Cherubini, L. 2012.Teak Resources and Market Assessment 2010. Planted Forests and Trees Working Paper Series, Forestry Department, FAO, Working Paper FP/47/E, FAO, Rome, Italy.

Sangkul, S. 1998. Processing and development technology and future trends for teak utilization. In *Teak for the Future*. Proceedings of the Second Regional Seminar on Teak 29 May - 3 June 1995, Yangon, Myanmar. FAO Regional Office for Asia and the Pacific, Bangkok, Thailand. pp.123-130.

Genetic diversity of teak in the natural forests of the Western Ghats

Dr. M. Balasundaran
Former Programme Coordinator
Genetics and Biotechnology Division, KFRI
Email: bsundaran@rediffmail.com

High quality planting material is the foundation for successful teak plantation programme. During the International Training Programme on Innovations in the Management of Planted Teak Forests held last year at KFRI, Erik Dahl Kjaer and colleagues suggested development of a Genetic Business Plan to procure the best planting material for starting a successful plantation programme. This is relevant for establishment of plantations outside the natural range of teak. In such a planting, requirement of adequate genetic diversity within the planting stock is extremely important. As they rightly pointed out, there is a potential danger, especially if the planting materials are a set of clones because clonal plantations are highly vulnerable to new pests and pathogens because of the narrow genetic diversity of the planting stock. Provenances are a better source of planting stock as more genetic diversity is expected among trees. Natural forests are the resources for raising the future plantations using teak provenances.

In India, natural populations of teak provenances had remained as evolutionarily viable units with existence of large genetic variation two centuries ago. Later, human interferences such as, disproportionate selective exploitation, clear felling for raising plantations, and destruction of forests for non-forestry purposes such as dams, mines and farming, resulted in shrinkage of natural teak area and threatened its sustainability. Such isolated populations with lesser genetic diversity face considerable risk from the effects of altered environment such as climate change and global warming. In order to suggest conservation measures for these patches of natural teak and to undertake genetic improvement of plantations through infusion of new seed lot from such natural populations, precise information of their genetic diversity and population structure are important.

Report of a study on genetic diversity of teak in the natural forests of the Western Ghats has been published in the October 2012 issue of Conservation Genetics (Sreekanth et al., 2012). The genetic diversity within and between nine natural teak provenances of the Western Ghats of India belonging to the states of Kerala, Karnataka and Tamil Nadu was investigated using Amplified Fragment Length Polymorphism (AFLP) markers. AFLP is a DNA fingerprinting technique of very high resolution, capable of bringing out genetic relationship among trees within a population and between populations. The populations from Kerala State were Konni reserve forest, Peechi-Vazhani Wildlife Sanctuary, Parambikulam Wildlife Sanctuary, Wayand Wildlife Sanctuary and Nilambur reserve forest. From Karnataka state, samples were collected from natural forests of Shimoga Division and from Virnoli and Barchi from Haliyal Forest Division (Wildlife Sanctuary), and from Indira Gandhi Wildlife Sanctuary, Tamil Nadu. In general, gene diversity was moderate for the teak provenances. But the diversity was higher for populations from Southern Western Ghats, especially from Kerala state. The study showed large intra-population variation (>75%) implying that selecting very few trees from a population, as done for plus tree selection, may not be helpful for exploiting the large intra-population diversity. Hence, selection intensity has to be reduced and several good quality trees have to be selected within populations in order to enhance the genetic base of planting stock. In cluster analysis, individual trees within a population aligned together indicating specific identity of each population. Nilambur population showed a separate genetic identity among Southern Western Ghats populations matching with its popularly known phenotypic identity and wood quality.

A few of the good quality teak provenances of the Western Ghats such as Nilambur and Dandeli (Barchi and Virnoli) have lost genetic diversity quicker than other provenances inviting attention for efficient *in situ* and *ex situ* conservation measures. In spite of the fact that the reduction in the extent of natural teak forests of the Western Ghats have come into sharp focus recently, we have patches of natural teak forest showing sufficiently large genetic diversity in the Southern Western Ghats. The need of the hour is to provide sufficient protection to these precious natural teak belts from all kinds of disturbances.

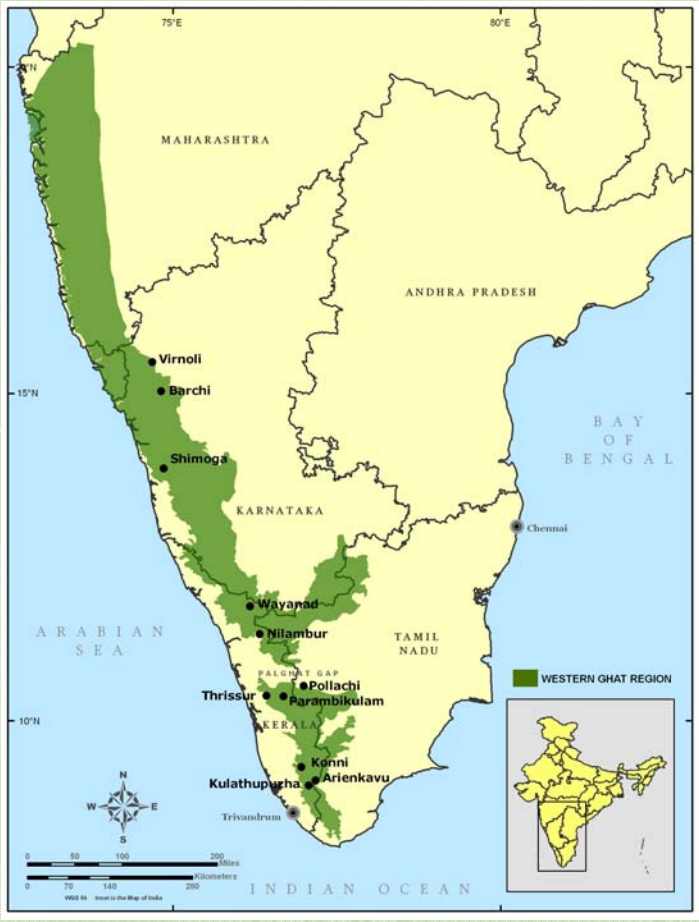
Read more on page 7

Continued from page 6

Reference

Sreekanth, P.M, Balasundaran, M., Nazeem, P.A. and Suma, T.B. 2012. Genetic diversity of nine natural *Tectona grandis* L.f. populations of the Western Ghats in Southern India. Conservation Genetics 13:1409-1419.

Teak in Barchi, Karnataka, India



Map showing the locations of natural populations of teak in the Western Ghats region selected for AFLP analysis.

Teaknet Bulletin is a biannual electronic newsletter of TEAKNET brought out in March and September, every year through its website. It is intended for circulation among the members of TEAKNET and other stake-holders of global teak sector. The views expressed in the newsletter are those of the authors and do not necessarily reflect the views of the organization. The readers are welcome to express their opinions or pass on information of value to teak growers, traders, researchers or others concerned with teak. However, TEAKNET reserves the right to choose the contributions for publishing and also to make necessary editorial modifications in the articles in consultation with the authors.

Address all communications to:

TEAKNET Coordinator
Kerala Forest Research Institute
Peechi-680 653, Thrissur
Kerala, India
Tel: +91 487 2690396
Email: coordinator@teaknet.org