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**Editorial**

The most prominent thing about TEAKNET in the past two years is the visible growth or expansion of the network and the clarity in the direction in which it is moving. Currently, we have a total number of 61 members, mostly traders and growers. The stakeholders of teak sector comprise researchers, growers, traders and others concerned with teak in one way or other. Researchers are mostly well organized and form part of some establishment. It is difficult to find lone researchers in teak as the activity by itself is expensive and time consuming. Traders and growers many times get united but are a self-competing group. TEAKNET offers a space for them to unite, to address their common issues and to interact with people of other groups. Being dominated by the growers and traders, it is most likely that TEAKNET gets oriented towards meeting the needs of these groups of its members.

In order to capture the attention of the youngsters, especially students and others, who do not opt for a formal membership, TEAKNET extended its reach to these groups by entering facebook which is a more popular form of social networking. This has been found to be a strategy adopted by even reputed organizations like FAO and CIFOR to get their messages down to anybody who needs to be captured.

One other important development was that the efforts to identify focal points for TEAKNET succeeded. CATIE agreed to act as a TEAKNET hub for Latin America and the Forestry Research Institute of Ghana (FORIG), for Africa. KFRI acts as one for Asia. The idea of focal points is to decentralize the activities so as to have focus on localized activities without losing overall control. It will now be possible to plan and execute many activities for the particular regions through these focal points. The priority list for these focal points includes localized training programmes for entrepreneurs, in cultivation and trade of teak.

The next TEAKNET international conference was announced during the Costa Rica conference. The fete was to take place in November 2012 in Bangkok. However, this has been postponed for a while considering the possible flood situation in Thailand during those times. The organizing committee met recently in Bangkok and discussed many details of this conference.

The Planted Forests Programme, FAO, Rome has just now completed its Teak Resources and Market Assessment. Dr. Walter Kollert has been kind enough to part with the summary of the technical report he has prepared for information of the readers of this bulletin. The findings of the study are of great importance for TEAKNET and all concerned with teak as we now know the status of teak in several countries and also at the global level in respect of area, production, productivity, prices and so on. Dr. Kollert has also promised to put the corresponding database in the TEAKNET Website eventually. Dr. Kollert is of the view that planted teak is the only valuable hardwood that constitutes a globally emerging forest resource. Worldwide, the major teak trade flows are directed towards India, while its own considerable teak production is processed within the country.

This issue also reports the summary findings of a local level assessment of productivity of teak plantations in the State of Kerala, India, done at the Kerala Forest Research Institute in collaboration with the Kerala Forest Department. Unlike in many new generation teak growing countries, the productivity levels of traditional teak countries are poor. The reasons are multifold and require much attention.

TEAKNET has been releasing many issues of this bulletin over the last two years. Except for the responses received from people like Dr. Sadanadan Nambiar of CSIRO, the general finding is that people, simply read through the material and keep quiet. That is not a good trend. The spirit of networking is information sharing and mutual interactions. It is once again emphasized here that TEAKNET actively looks for ideas and suggestions to improve the state of affairs with teak globally or locally. This script is now closing with an appeal to the readers to respond and be a part of this vibrant network.

Summer is prevailing in the Northern Hemisphere and a large part of Asian teak belt is awaiting rains for the teak trees to flush!!

With regards,  
Jayaraman



**Editorial Committee** *Teaknet Bulletin* is a biannual electronic newsletter of TEAKNET brought out in March and September of every year through its website. It is intended for circulation among the members of TEAKNET and other stakeholders 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.

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# Teak Resources and Market Assessment 2010

Walter Kollert and Lucia Cherubini

Food and Agricultural Organization of the United Nations (FAO), Rome

In 2011, FAO conducted the Teak Resources and Market Assessment 2010 (TRMA 2010) in 69 tropical countries in Africa, Asia and Latin America to present updated country-level information on teak (*Tectona grandis*). The assessment was carried out through a standardized questionnaire filled by national experts from government departments, research institutions, universities and private companies in teak growing countries to ensure that the best and most recent data, information and knowledge on teak resources and markets are made available and are shared with other colleagues. The following table provides a response rate analysis by region. FAO thanks all contributors for their vital collaboration, without which this study would not have been possible.

**Table: Questionnaire response rate by region**

	<u>Countries in</u>						
	Africa	Asia	Caribbean	Central America	Oceania	South America	Total
Questionnaires sent to	26	16	5	7	5	10	69
Answers received by	19	12	4	7	3	7	52
Teak reported to grow in	12	12	4	7	3	5	43
Data on teak available in	10	10	3	7	3	5	38
Share (%)	38	63	60	100	60	50	55

The TRMA 2010 compares its results with previous teak resources assessments and provides data on the following parameters: natural and planted teak forest areas, age class distribution, ownership, growth performance and rotation age, log removals, international trade in teak, teak prices and quality. The dataset is a useful reference to assess certain country situations and trends, and there is no better up-to-date information on teak resources available at the moment. The users of these data should, however, be aware that the information provided has some flaws and must be treated with care. Firstly, not all teak growing countries did report for TRMA 2010, and secondly, in most cases the country correspondents found it difficult to source, retrieve or estimate data on teak in the absence of reliable and accurate statistics at the species level. The full report (FAO Planted Forests and Trees Working Paper FP/47/E) can be downloaded from the FAO webpage <http://www.fao.org/forestry/plantedforests/67508@170537/en/>.

The summary and conclusions of the full report are presented below for the esteemed readers of the TEAKNET-Bulletin.

- Global significance of teak.** Teak makes a small proportion of world timber production and trade. The estimated market share of teak logs in total tropical round wood production is less than 2% but in terms of value it is much larger, since teak is part of the high-value hardwood market, and is a major component of the forest economies of many tropical countries. 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.
- Survey coverage.** The Teak Resources and Market Assessment 2010 (TRMA 2010) conducted a survey in 2011 in 69 countries, 9 of which reported that they do not grow teak. 43 countries reported that they grow teak, but of them only 38 countries were able to give data on the species.
- Teak areas.** Natural teak forests are estimated to cover 29.035 million ha in India, Lao PDR, Myanmar and Thailand. Almost half of the total is in Myanmar. The area of planted teak forests reported by 38 countries is estimated to be 4.346 million ha, of which 83% is in Asia, 11% in Africa, and 6% in tropical America. Taking into account the data missing from 22 teak-growing countries, this figure certainly underestimates the actual area of planted teak forests.
- Planted teak – a globally emerging hardwood.** Planted teak is the only valuable hardwood that constitutes a globally emerging forest resource. Compared with previous surveys, the planted teak area has increased greatly in Africa (Benin, Ghana, Nigeria, United Republic of Tanzania), Central America (Costa Rica, El Salvador, Guatemala, Nicaragua, Panama), South America (Ecuador, Brazil) and Asia (India, Indonesia, Myanmar, Lao PDR).

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5. **Age class distribution and rotation age.** Planted teak forests are predominantly (77%) younger than 20 years. The prevailing age class distribution shows recent efforts to establish planted teak forests, but the current enthusiasm of many corporate and private investors for planted teak will maintain the youthful age structure and, in order to improve the economic rate of return, will tend to shorten the rotation period. This will lead to a significant increase in the supply of small-dimension logs grown in short rotations not exceeding 20 years.
6. **Ownership.** In Africa, Asia and the Caribbean, most planted teak forests are owned by governments, generally the forestry or agricultural administration, but in Central and South America state governments own merely between 1% and 12% of planted teak forests, while the private sector holds 88% in Central America and 99% in South America. Teak is not currently a priority species in community forestry, although there are a number of cases of smallholder teak plantations which have contributed to the improvement of rural livelihoods.
7. **Growth performance.** 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 20m<sup>3</sup>/ha/year. 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 (MAI) reported by 26 countries appears rather modest and lies, between 2 and 14 m<sup>3</sup>/ha/year for most regions, except for some high-intensity investment schemes in Central and South America.
8. **Log removals.** A volume of ca. 0.5 million m<sup>3</sup> is currently estimated to be harvested in natural forests and 1.5 to 2 million m<sup>3</sup> in planted forests if all teak producing countries are accounted for. The world's total teak supply from natural and planted forests adds up to 2 to 2.5 million m<sup>3</sup>, of which at least 60% are cut in India, Indonesia and Myanmar. The estimated market share of teak logs on the total tropical roundwood production is less than 2%. In value terms a much higher share can be expected, but there are no data to support this.
9. **Supply from natural teak forests and genetic resources.** Myanmar is the only country producing quality teak from natural forests as India, Lao PDR and Thailand have logging bans in natural forests or log export bans in place. A maximum sustainable supply of quality teak from Myanmar is likely to be in the order of 400,000m<sup>3</sup>/yr or less. In future it can be expected that the sustained production of teak logs from natural forests will be further limited due to increasing deforestation and competition for environmental services. Hence, the 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.
10. **Global teak market trends.** The global teak market has been and will continue to be governed by trends in the Asian market. Asia holds more than 90% of the world's teak resources and India alone manages 38% 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.
11. **Indian demand dominates the market.** The major teak trade flows worldwide are directed towards India, while its own considerable teak production is processed within the country. Eleven out of fourteen reporting countries name India as their number one importer, absorbing 70% to 100% of global teak exports including shipments of plantation logs and sawn timber from Africa and Latin America. In Africa, significant exporters are Benin, Ghana, the United Republic of Tanzania and Togo. In Latin America, Ecuador, El Salvador, Guatemala and Brazil are important teak exporters (no information was available from Costa Rica and Panama).
12. **Price and quality.** Obtaining prices for teak logs and sawn timber proved to be difficult. No common international log grading rules have been established, most exporting countries' definition of log dimensions turned out to be different, and the use of various measuring units for dimension and volume further complicated the price survey. As a general rule it can be established that teak prices are very closely related to wood quality. Quality in teak is determined by dimension, bole shape (roundness and straightness), heartwood/sapwood ratio, regularity of annual rings, number of knots, colour, texture and the soundness of the butt log. Teak from natural forests, in general, possesses many of these features to some extent and sells at comparatively high prices. Logs from planted teak forests are typically smaller in size and will hardly ever reach the dimension, quality features and prices of logs grown in old-growth forests.

# Productivity of teak plantations in Kerala, India

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The history of planting of teak in Kerala, India dates back to 1844 but major expansion in area under the species in the State occurred during the period 1960 to 1980 as part of the Five Year Plans. An assessment in 1995 had shown 68,797 ha of teak plantations under Territorial Divisions in the State. Teak thrives best in fairly moist, warm, tropical climate and is best grown in well drained alluvial soil. Consonant with the fairly high variability in the soil, topographical and weather conditions in the State, there is a high degree of regional variation in the productivity of the plantations. Traditionally, teak is grown under rain-fed conditions in the State under a least intensive form of management. In Kerala, teak is worked on a 50 to 60 years of rotation.

During 1996, an evaluation of the productivity of the teak plantations in Kerala based on a state-wide sample survey had indicated a MAI of 2.423 m<sup>3</sup> ha<sup>-1</sup> at 60 years for the standing crop (Nair *et al.*, 1997). A comparison with potential MAI of 4.968 m<sup>3</sup> ha<sup>-1</sup> at 60 years under site quality class I with full stocking as reported in the All India yield table for teak revealed the wide gap between the actual and potential yield levels. An assessment of site quality distribution of the area showed that only 5 per cent of the area fell under site quality class I. Nearly 38 per cent of the area was of site quality class II and 48 per cent was of site quality class III. Around 9 per cent of the area fell under site quality class IV. About 0.1 per cent of the total area was estimated as degraded. The MAI of total yield which includes main crop and accumulated yield of thinning at 60 years worked out to 3.110 m<sup>3</sup> ha<sup>-1</sup>.

One of the reasons for low productivity then was traced to the poor stocking of the plantations. Based on basal area ha<sup>-1</sup>, nearly 48 per cent of the plantation area was estimated as under-stocked, 26 per cent was classed as over-stocked and the remaining 26 per cent carried fully stocked stands. The corresponding figures based on number of trees were 64, 17 and 19. Among the under-stocked plantations 33 per cent of the area showed very poor stocking with stocking ratio less than 0.5. Nearly 88 per cent of the plots showing under-stocking by basal area were under-stocked by number of trees also confirming that the under-stocking resulted due to less than expected number of trees in many stands.

Findings from a similar but more extensive evaluation of the status of teak plantations in the State in 2011 were the following. The extent of teak plantations under reference was 56,509.45 ha as of 2011. Much plantation area under teak was diverted to wildlife sanctuaries and for other purposes. Nearly 85 per cent of the plantations were above 30 years of age. The status of teak plantations in the Territorial Divisions of Kerala was assessed with respect to the site quality distribution and stocking and the current levels of productivity were ascertained. The plantations of teak and teak mixed with other species belonging to the Territorial Forest Divisions under the management of Kerala Forest Department were covered. Each plantation was evaluated through a systematic sampling plan using sample plots along transects. Measurements were taken from plots of size 24 m x 24 m laid along randomly placed transects in the plantations.

An assessment of site quality distribution of the area showed that only 3 per cent of the area fell under site quality class I. Nearly 33 per cent of the area was of site quality class II and 56 per cent was of site quality class III. Around 8 per cent of the area fell under site quality class IV. There was considerable variation in site quality distribution over the different Divisions. Nemmara and South Nilambur Divisions recorded a good share of area under better site quality classes (SQ I and SQ II) whereas Thiruvananthapuram, Wayanad, Ranni, Kottayam and Kothamanagalam had larger area under poorer site quality classes.

The evaluation of stocking status ignoring miscellaneous growth revealed that, based on basal area, nearly 15 per cent of the plantation area was under-stocked, 47 per cent fully stocked and 38 per cent over-stocked indicating that the growth was poor in many plantations in the State. The corresponding figures based on number of trees were 7, 24 and 69. Based on basal area density, under-stocked plantations were more common in North Nilambur, Munnar, Thenmala and Malayattoor Divisions. The case of over-stocked plantations occurred more frequently in Ranni, Punalur and Kannur. The over-stocking was found partly due to the presence of larger number of trees in the stand rather than due to the better growth of trees.

This in turn reflected in the MAI of commercial volume attained in these Divisions. The average MAI of main crop came to 2.420 m<sup>3</sup>/ha/annum at 60 years. This value is based on the standing volume of trees and thus excludes yield from thinning. Estimate of the yield from accumulated thinning was not available for the current period. However, the correspondence between the current and previous estimates of the productivity of the standing crop, with a gap of 15 years, was astounding in the sense that the productivity level has recorded neither an increase nor decrease in spite of the more recent efforts by the authorities to improve the stocking levels of the plantations by skipping thinning.

## Reference

Nair, K.S.S., Jayaraman, K. and Chacko, K.C. 1997. Productivity of teak and eucalypt plantations in Kerala. KFRI Consultancy Report, Kerala Forest Research Institute, Peechi: 78p.