Regional Workshop
Processing and Marketing of Teak Wood Products of Planted Forests
25-28 September 2007, Kerala Forest Research Institute,
Peechi, Kerala, India: A Draft Report

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INTRODUCTION

Teak (*Tectona grandis* L.f.) is being grown in plantations in more than 36 tropical countries across the globe although its natural occurrence is limited to India, Laos, Myanmar and Thailand. Of the estimated 187.1 million hectares of global forest plantations in 2000, about 5.7 million hectares (3%) were teak, representing about 75% of the world’s high-quality tropical hardwood plantations, the major producers being India, Indonesia, Myanmar and Thailand in the Asia Pacific region. It is little wonder that teak excites more interest among the general public than any other tropical hardwood for its versatile wood with sterling properties. The rapid expansion of the teak plantations, however, poses a risk of undermining its reputation in global market place because of wide variations in wood quality with the net effect of reducing the prices and therefore the financial viability of teak planting programmes. To avoid this, teak growers, at the community and industrial levels, must ensure that the wood they produce is of the highest possible quality, which will mean choosing the right sites carefully, using good genetic stock, employing optimal rotation cycles and appropriate silvicultural techniques.

Over the past decade, at least four international seminars/workshops were held in the Asia Pacific Region to address the issues relating to teak resource management and utilisation. However, knowledge of performance and behaviour of teak wood products of planted forests/clonal trees of shorter rotation including agroforestry and home garden forestry sectors is still inadequate in the context of sustainable tropical forest management (SFM). Timber trade and SFM are the two key components of globalization and sustainable development of teakwood sector. The Workshop addressed the major challenges of ‘new age eco-products’ of teak that use innovative technologies for quicker production of quality timber and value addition to the products together with reducing wood waste for overcoming the limitations of small dimensional new resources as summarized below:

### CORE ISSUES ADDRESSED IN THE REGIONAL TEAK WORKSHOP 2007

- Slow progress towards SFM in the Tropics
- Limited contributions from utilisation of plantation teak wood sector
  - Insufficient technical data on wood properties of planted teak of various sectors and seed sources/clones
  - Insufficient knowledge / training/capacity in value addition for marketing of products
  - Lack of effective regional networking / dissemination / material exchange mechanism
OBJECTIVES

In pursuance of sustainable development of teak wood sector in the Asia Pacific Region, the Workshop provided an international forum for developing a regional project on processing and marketing of quality products of planted teak from sustainable tropical forest management. It was envisaged that participation of major Asian teak producer countries, viz. India, Indonesia, Malaysia, Myanmar and Thailand together with the importing countries would accomplish the task as project partners.

The major objectives of the Regional Workshop were:

1. Clear understanding of national policies and programmes of the producer countries as project partners particularly in promoting the trade from further processing and marketing of teak products
2. Identification of the lead countries in relevant areas of research and training as well as networking to cater to the needs of the international stakeholders
3. Establishment of working relationships with necessary commitments from among the project partners for developing a regional project on teak.

Organizers and sponsors

The Workshop was hosted by the Kerala Forest Research Institute (KFRI) under the auspices of the following sponsors:

- International Tropical Timber Organization (ITTO), Japan
- International Union of Forest Research Organisations - Teak Wood Working Party
- (IUFRO 5.06.02)
- Ministry of Environment and Forests, Government of India

Participants and target beneficiaries

A total of 90 delegates representing 14 countries of Asia, Australia, Europe, Central and South America participated in the 4-day Workshop including one day field excursion. In addition to the scientists/researchers from various Organizations / universities, the target beneficiaries of the Workshop were small timber holders / farmers, processing enterprises, traders, State Forest Departments, Forest Development Corporations and Policy Makers representing the following Governmental NGOs:

Farmers/Associations

- Bharathiya Kisan Sangha, Karnataka
- Mangala Farms, Karnataka
- Varanashi Research Foundation Karnataka

Industrialists and Traders

- OLAM International Ltd, Singapore
- Timber Importers Association of India,
- Regency Wood Products, Mumbai
- The Western India Plywood Industries Pvt Ltd. Kerala

Policy Makers and State Forest Departments/Corporations

- Ministry of Environment and Forests, Govt. of India
- FAO, Regional Office for Asia and the Pacific (RAP), Bangkok, Thailand
- ITTO, Japan
- Kerala Forest Department, India
- Kerala Forest Development Corporation, India
INAUGURAL SESSION

The Workshop was inaugurated by Mr. S. Regupathy, the Hon’able Minster of State for Environment and Forests, Govt of India and presided over by Mr. Rajaji Mathew Thomas, Member of Legislative Assembly, Govt. of Kerala. The welcome address was given by Dr. E. P. Yesodharan, Executive Vice President, Kerala State Council for Science, Technology and Environment. Dr. R. Gnanaharan, Director, KFRI welcomed all delegates to the host organisation. Mrs. Lilly Francis, President of local Grama Panchayat and Mr. S C Joshi, IFS, Chief Conservator of Forests, Kerala State gave felicitations. Dr. S. Appannah, National Forest Programme Advisor, FAO, Bangkok gave the keynote address. Dr. K. M. Bhat, Workshop Convener proposed vote of thanks.

TECHNICAL SESSIONS

A total of 20 oral papers and 18 posters were presented in nine different sessions including panel discussions. The technical sessions of oral presentation included: Plenary, Country reports, Status papers and other themes as stated in this report elsewhere.

Plenary Session

The session was chaired by Mr. Masakazu Kashio, Forest Resources Officer, FAO, Regional Office, Bangkok. Mr. R.T Somaiya, President, Indian Timber Importers’ Association, India was the Co-chair. Dr. K.C Chacko and Dr. V. Anitha were the rapporteurs.

Messrs. Jukka Tissari and Mikko Jaaskelainen, Finland, presented the plenary paper on Processing of planted teak in producer countries: Problems and prospects. They stressed the point that plantation teakwood is generally inferior to the reputed wood of naturally grown teak and therefore processing costs would be higher to make the product suitable for refined applications. They recommended for the producer countries to consider development of domestic processing of teak as a policy objective. Greater stress may be given to provenance selection, improvement and plantation management for intended end-use and processing innovation such as heat-treatment systems and camera vision and CAD (computer-aided design) technology.

Mr. Raymond Keogh, Ireland presented the plenary paper on international pricing mechanism for the wood of planted teak. He pointed to the wide gap existing between demand and supply of hardwoods. There is a need to create more hardwood plantations and this call for substantial increases in investments. He made clear that due to lack of standards and appropriate information there is wide spread uncertainty and confusion about teak investments, particularly in relation to prices. He emphasised that establishment of an information system enabling investment decisions is a need of the hour.

Dr. John Joseph, India presented a paper on Teak farming: challenges and opportunities. Agroforestry is an important option to meet the demand of wood-based and other allied industries. Lack of quality planting stock and difficulties in following the existing timber trade rules are major constraints of teak wood farming.

His recommendations include the following issues:
Strengthening of institutional arrangements to supply quality and source-identified planting stock


A paper on Genetic resources for higher productivity of planted teak forests was presented by Jon K R Hansen with his co-authors, viz. Daniel Ofori, Appolinaire Koffi, Anders Raebild, Phillippe Vigneron and Erik Kjae was presented. This paper brought out the following points:

Genetic improvement of teak needs serious attention in improving productivity and timber qualities. International provenance trials are helpful in identifying source materials for propagation

Multi-locational international provenance trials for teak must be promoted to understand genotype-environment interaction thereby enabling selection of appropriate provenances for different sites around the world.

Movement of teak seeds for propagation between countries should be made easier. Teak growing countries may be advised to make necessary modifications in their policy and procedures to enable easy movement of teak seeds across teak growing countries.

Session: Country Reports from Asia

The country reports were presented from four Asian countries: India, Indonesia, Malaysia and Thailand. While briefing the policy issues highlighted in dr. Bipin behari’s paper, Dr. Mammen Chundamannil presented a paper on investments and economic returns from teak plantations. He examined the economics of teak plantations in relation to some alternative species. After tracing the history of teak plantations in Kerala, Dr. mammen stressed on the environmental benefits from planted teak and proposed teak as an economically viable plantation species.

Mr. Sadhardjo Siswamartana presented a report on Indonesian teakwood marketing and industries. His report emphasised the following points:

Teak is a highly preferred timber species in Indonesia and so unauthorised logging is very common. The productivity has increased by 75 percent by way of tree improvement programmes.

The plantation activity should take into account the environmental and community based conservations.

About 50% of annual teak wood production, amounting to 300,000 is exported from Indonesia.

The report on policy and status of teakwood production, processing and marketing from planted forests in Thailand was presented by Mrs. Chumnun Planhanuruk. Thailand had extensive teak forests, which were later brought under the management of the Royal Forest Department. Logging ban introduced in 1989 adversely affected the plantation activity after which Thailand became a teak importing country. Wood processing still uses low technology and immature wood and the products fall short of international standards. She recommended for training programmes to improve wood processing skills and productivity.

Dr. Lim Hin Fui with the coauthors Tan Yu Eng, Ahmad Fauzi Puasa, Norini Haron, pand Lim Seng Choon presented the report on Policy and status of planted teakwood: Its properties and processing in Malaysia. The country has around 6000 ha of teak plantations. The technology for processing and marketing is yet to developed. Indications are that teak products have a market potential which has initiated much planting activity while some panters ask the question - where they can sell off the wood from their young teak plantations. He suggested that more information on potential markets and end-uses of teakwood need to be disseminated to the planters and wood-based industries.
Session of Status Papers : Teak Wood of Planted Forests  
Chair: Dr. S. John Joseph, India  
Co-Chair: Dr. Ichiro Nagame, Japan  
Rapporteurs: Dr. Jose Kallarakal and Dr. E.M. Muralidharan

The first speaker was Mr. R.T. Somaiya, who spoke on the “Improvement of planted teakwood by Vrikshayurved methods”. He described Vrikshayurved as the ancient science of (plant) life that in his experience could be revived to benefit teak cultivation. He spoke of teak being a ‘social’ species that grows with other tree species in the forests and therefore a mix of different species in the cultivation of teak would be beneficial. His presentation led to comments and questions on what is the right mixture of species would be and whether healing of diseases and pest was also part of the tradition. Others commented on the need for research on the subject and how economics and money govern the cultivation of species.

The next speaker was Dr Gills Chaix who made a presentation on “Quality control and mass production of teak clones for tropical plantations” and spoke about the performance of the trials in Sabah made ten years ago. Teak exhibited high variability in growth, morphological traits and wood properties. NIRS and molecular markers were used for assessment of the wood properties and for fingerprinting of the clones. Mass cloning of the teak through tissue culture was done. Questions were asked about the nature of the explants used for tissue culture and the age of the plus trees being propagated. It was clarified that maturity related problems were not experienced.

The next presentation was by Peter Laming, Netherlands on Aspects of natural decay resistance and hysteresis of juvenile teak thinnings from Southern Mato Grosso, Brazil. He presented data on heartwood and sapwood of juvenile teak from thinnings. Fungal resistance, dimensional stability, gluing properties were studied vis-à-vis the suitability for utilization.

Mr Sylvio de Andrado Coutinho, Brazil described the activities of the largest teak plantation company in Brazil and spoke about the benefits and challenges of certification with regard to the sustainability of planted teak forests. He gave information about the different certification agencies.

Session: Processing, Marketing and Price Trend

The session was chaired by Mr. Jukka Tissari, Finland and co-chaired by Mr. Hiroshi Nakata, Japan. The rapporteurs were Dr. P.K.Muraleedharan and Dr. C. Surendran, KFRI, India. There were seven papers in the session of which one paper was on wood quality of planted teak, two on processing, three on marketing and pricing and one on forest certification of planted forests.

The first paper: Wood Quality of planted teak outside forests by P.K.Thulasidas, India attempted to assess the teak timber quality and value of home garden teak. The study evaluated timber quality of 35-year-old teak grown in homesteads representing wet and dry localities of Kerala in comparison with that grown in forest plantation of Nilambur – widely reputed for Malabar Teak with regard to wood quality. The general assumption is that the teak grown in forest plantation areas is much superior to that of home gardens and based on which the price received by the latter categories is less. One noted conclusion of the study was that teak wood from home garden is not inferior to that of forest plantation in its strength properties and heartwood proportion of the stem volume. This should be popularized among the farmers to get better prices for their teak wood.

Mr. Maya Mohamed, India in his presentation explained the major wood processing activities of the Western India Plywoods, Ltd, Bialiapatana, Kerala. He stressed the need for prudent use of raw materials and production of more and more innovative products of higher value addition, especially in the context of depletion and shortage of timber resources in the country.
Dr. Kishan Kumar, India presented a paper on the drying behaviour of teak under vacuum press drying. The experiment was conducted under three different vacuum level-temperature combinations. He attempted to analyse the combination that gave maximum drying rates in terms of moisture content reduction in two different initial moisture content ranges. It was found that the samples could be dried faster by employing combinations of 90°C and 873 mbars of pressure. The study also indicated that drying rate under vacuum press drying is faster than that of conventional seasoning methods.

The paper: Marketing efficiency of planted teak in Madhya Pradesh: A case study of Jabalpur Circle, by Parag Dubey and Sathish kumar, examined marketing efficiency of planted teak in Madhya Pradesh. The State Forest Department (SFD) and Forest Development Corporation (FDC) are the two agencies which market teak in Madhya Pradesh and therefore, the authors compared the marketing efficiencies of these two agencies. One important conclusion of this study was that the selling price of FDC is lower than that of SFD and the difference amounted Rs. 4300/- per cmt. This was mainly due to better quality of teak produced by the Forest Department (due to long rotation). Thus the timber merchant buys timber from the FDC and sell at par with existing timber price which gives a high profit to them.

In the paper: Teak market in Kerala-Production, consumption and trade by Dr. Krishnankutty, India attempted to analyse the structure of timber market in Kerala. According to him, volume of the teakwood market in Kerala is to the tune 96,000 m³, 62% of the teakwood production comes from forest plantations while only 2% of the production of other timbers come from forests. The net import of teak logs of larger girth was 7,100 m³. The trend in import of timber is increasing whereas export declining. Kerala, a traditional producer and exporter of teakwood, is now a net importer. There is hardly any international market for Kerala teakwood due to non-availability of logs of larger girth. This may be due to shortening of rotation age of forest teak plantations to 50 years that has reduced the production of high value larger girth logs. A policy for growing logs of larger girth must be adopted by increasing the rotation age of forest teak plantations.

Projection of future availability of teak wood from forest plantations and its prices in Kerala State, was done by Dr. Sivaram, India. He attempted to project the future availability of teak wood from forest plantations based on age structure under different scenarios and assess how far forest plantations will meet the future teak wood demand. He used statistical models to predict the future availability of teak wood from forest plantations. The analysis of trends in current and real prices indicates that the price increase during 1990’s was low probably due to availability of substitute materials and increased timber import during the period. However, of late market for teak wood is picking up. The study also indicated that the high quality teak wood would fetch higher prices in the year 2007.

The presentation on Forest certification of planted forest based on the experience of Bhopal-India Process by Dr. Manmohan Yadav, India explained the need of managing the planted forests by following sustainable forest management practices. He also explained various initiatives on developing standards of SFM after Rio-earth Sumit on sustainable development. The study pointed out that forest certification emerged as a marketing tool for linking the good forest management practices with the environmentally conscious consumers. It was pointed out that the National criteria and Indicators for SFM developed under Bhopal India Process provide an opportunity to develop a national forest certification scheme for India.

**Session : Project Elements from Partner Countries**

Chairmen – Dr. Daniel Bhaskaran Krishnapillay, Malaysia and Mr Raymond Keogh, Ireland. The rapporteurs were Dr. Mamen Chundamannil, India

Dr. K. M. Bhat was the first Speaker. He introduced the concept of a Regional Project Formulation to be prepared by Teak growing countries in Asia for submission jointly to ITTO. He showed a project preparation format for listing the objectives, strategy, activities, the time schedule, the expected outputs etc for the guidance of those who draft the different country components.
The second Speaker was Mr Sadhardo Siswamartana from Indonesia. As head of the Forest Department of Indonesia, he presented their need for learning and applying the KFRI developed NPV Virus for the leaf pest of teak trees as a project component and another to develop a “back to nature” management of teak as a mixed natural stand instead of the current monoculture plantations. He stressed the need for enlarging the genetic base of the planted teak in Indonesia.

The third Speaker was Mrs Chumun Pianhanuruk of the Royal Forest Department of Thailand. Her accent made it impossible to comprehend their needs. I guess that it related to help with research on pests problems of teak and also for the upgradation of the wood processing industry with more modern technology.

The fourth speaker was Dr Kasio of FAO, Bangkok speaking for Myanmar as no delegate had come from there. The four themes he presented were: 1. Improvement of the Myanmar Selection System of managing teak, 2. Plantation improvement, 3. Modernisation of the wood processing industry which presently consists of very old machinery originally made to process huge logs which are becoming quite scarce. He commented that the existing wood processing machinery there would be good museum pieces and 4) development of Information services and connectivity which is extremely primitive in comparison with other teak growing countries.

The fifth Speaker was Dr Tan Tu-Eng from Malaysia. He pointed out that teak is not a traditional tree for farmers or the Forest Department of Malaysia, There are some shops selling teak furniture and handicrafts of teak from Indonesia. Teak farmers in Malaysia are unsure of who would be their buyers and what prices they can expect from the tree when it is harvested. Dr Tan talked about harmonising the regional capabilities and strengths of the teak growing and marketing countries. The wood processing industry is very advanced in Malaysia which is their strength which can be utilised for processing teak from other countries to produce value added products.

During the discussion that followed, Mr. Krishna Kumar of FRI, Dehra Dun, India remarked on the need for growing teak for the industries. Dr. Nagaraj of IFGTB Coimbatore wanted genetics of teak to be focused with programmes on hybridisation and cloning. Dr Palani Swami again of IFGTB wanted Seed orchards to be stressed. Mr Ricardo, from Costa Rica wanted multi country provenance trials to be carried out and research on the under story species in teak plantations for improving the cash flow from teak plantations. Dr Manmohan Yadav of IIFM Bhopal wanted information on prices and adoption of universally acceptable grading rules. Mr Ramon, ITTO representative from Japan wanted to know who will lead the regional project.

Dr Kasio of FAO made the final comment touching upon the need to formulate a common approach integrating the needs of the participating Asian countries to make a regional programme. While making the project the preferences of the funding agencies have also to be kept in mind. He suggested the preparation of two or more projects, for example, bundling the market oriented components in one, which will be definitely supported by ITTO as it is their priority and another project focussing on the environmental aspects in another project to place before the Global Environment Facility of the World Bank.

**PANEL DISCUSSION: REGIONAL PROJECT FORMULATION**

The panel discussion on regional project formulation was chaired by Dr. S. Chand Basha IFS (Rtd), former director, Kerala Forest Research Institute. Dr. Manmohan Yadav, Associate Professor, Indian Institute of Forest Management was the Co-chairman. Dr. S. Sankar and Dr. M. Balasundaran, from KFRI were the Rapporteurs.

At the outset, Mr. Jukka Tissari from Finland presented his views. He favoured 2-3 proposals encompassing not only the major Asian teak producers, but also Central and Latin American and African countries. He appreciated the Malaysian approach of technological evaluation for quality attributes. The other points he touched upon included development of new technology for quality product development from planted teak, harmonizing market with socio-economical
aspects, the importance of Myanmar as the natural resource giant and China as the biggest emerging consumer.

In his presentation, Mr. Raymond Keogh from Ireland stressed the importance of taking projects on devising pricing policy, harmonizing grading rules and attaching price tag for quality and grade. In the discussion followed, the impact of sellers’ ignorance of market price and the problems in formulating international grading rules were touched upon.

Mr. Peter Laming from Netherlands emphasized the market premium for quality product. He commented the European buyers’ willingness to buy the products, provided reliable quality and regular supply are assured.

Dr. Ishiro Nagame from Japan voiced importance of projects with global perspectives such as millennium development goal, addressing global warming and poverty alleviation. The other points touched upon were on the importance of partnership with stake holders and problems in international transfer of genetic material.

Mr. Hiroshi Nakata from JICA, Japan expressed his opinion on formulating grading rules. He stressed the importance of networking in processing and marketing. He listed the important potential elements, as the transfer of genetic material for plantation activities, international pricing mechanism and timber grading system and cost of networking and revitalizing Teaknet. The necessity for unhindered movement of genetic material was elaborately discussed.

Dr. D.B. Krishnapillay, presenting on behalf of Dr. D. Appanah from FAO regional Office Bangkok stressed the need for making Teaknet operational for information dissemination. Promotion of R & D activities on short rotation crop and a viable pricing mechanism were the other major points raised by him.

The process and steps involved in approval of projects by ITTO was explained by Ramon Carillo. How the project implementation will benefit the stake holders would be a key point for consideration in sanctioning the projects.

While summing up, Dr. Manmohan Yadav discussed the issues and matters raised in the presentations point by point and stressed the necessity of addressing IPR issues in particular.

Before closing, the Chairman expressed his apprehension about the feasibility of transferring genetic materials due to governmental policy restrictions, though transfer of knowledge is possible.

**Satellite Meeting of TEAKNET**

**Chairman for the session:** Dr. S. Appanah, National Programme Advisor, FAO, Bangkok;

**Co-chairman:** Mr. Masakazu Kashiio, Forest Resources Officer, FAO, Bangkok.

The Chairman in his opening remarks presented the agenda items for the meeting. The agenda items were as follows:

i) Brief introduction to TeakNet  
ii) Decision to be taken for future of TeakNet  
iii) Location, structure and function  
iv) Steering committee  
v) Financial and Physical support

The members agreed the agenda items to be discussed.

**Brief introduction to TeakNet**

Dr. Daniel Bhaskaran Krishnapillai, Advisor to FRIM, Malaysia gave a brief introduction to TEAKNET where he presented why we need a Teaknet in the Asia pacific region, History of Teaknet, progress to date and also the rules, functioning of TeakNet, till late 1998 and since
then it was found to be very difficult because there was a restructuring in the Myanmar Government. Regular activities of Network became very difficult to implement and the TeakNet became inactive.

Dr. Daniel stressed the need of reactivating the TeakNet for the following reasons:

i) teak is an important hardwood species
ii) Readily traded in the world market
iii) Suited and grown in countries in different agro-climatic zones
iv) Now grown in 36 tropical countries
v) Out of the total 187.1 million ha global plantations, 3% are teak
vi) Have new production technology
vii) Needs definite grading rules and stable pricing
viii) Information to be disseminated to all those who are associated with teak

He also pointed out how we can proceed. He informed the forum that during last many years, much information is generated and there are many new findings. The findings, current pricing practices and other information are to be collected, organized and disseminated. The possible option he put forth is to make a strong recommendation to FAO for assisting to effect necessary changes as follows.

**Options**

- retain the network in Myanmar and find out ways and means to reactivate
- retain Myanmar as a Referral center for natural teak management and move the Secretariat to an existing strong Network like APPARI or APAFRI which could co-host under FAO.
- move the secretariat to a teak country that is a) currently active in teak management, research and trade and also willing to host the Network, b) to commit space, staff and funding c) country which is easily accessible and is able to support information portal.

With these remarks Dr. Daniel concluded the presentation.

The chairman requested the Steering committee members to express their opinion. All the steering committee members, Sri Somaiya, Mr. Kashio, Mr.Nakata and Dr. Daniel suggested to shift the Network to KFRI. Dr. Sadhardjo also agreed with this. It was also suggested to retain Myanmar as a Referral center for Natural teak forest management and to move the secretariat to KFRI.

Chairman wanted to record our gratitude (thanks) to Myanmar Government for supporting TeakNet in the past. He also asked the members to give their suggestions or disagreement for shifting the Secretariat to KFRI. Chairman also asked the Institutions to come forward to express the readiness to host the Network. Director, KFRI expressed the willingness to take up the TeakNet.

Mr. Carrillo from ITTO asked whether this forum could decide such matters and Chairman informed that since representatives from member countries are there a decision can be taken. The steering committee members also have taken a decision. Dr. John Joseph also doubted whether other steering committee members are consulted. It was made clear that others also have agreed. Chairman again asked whether KFRI has keen interest or any other Institution to be considered. Dr. Raymond Keogh upheld the decision and suggested that TeakNet need not be fixed to any country, but can move depending on the situation. Sri Somaiya pointed out that KFRI is active and is an important teak country and India is having natural teak forests and hence, KFRI can take up TeakNet. He also suggested that if any other country expresses willingness, an associate office could be activated.
**Structure and functioning**

With regard to the structure and functioning of TeakNet, Chairman noted that APAFRI is functioning in Malaysia by the support from FRIM and TeakNet can function with the support from KFRI. Sri Somaiya informed the forum that Teak21 is active and can cooperate and work with TeakNet and it should be complimentary to each other. With regard to the next step, Chairman suggested a feedback on TeakNet work.

Mr. Nakata asked how much contribution is expected from ITTO and ITTO has presently Biannual programmes. Mr Kashio told that ITTO project support is for countries and asked whether ITTO has any regional support. Chairman informed that support could be through member country (as APAFRI getting fund through FRIM).

Mr. Nakata informed that another project is submitted by Myanmar, which is same as that of India’s and this can be sorted out through TeakNet. Dr. Ichiro Nagame asked whether Chairman of TeakNet could be rotated. Chairman for the meeting clarified that Chairman of the TeakNet can be appointed from any member country and asked to fix the term for Chairmanship. Dr. Daniel cited APAFRI’s situation (having a Chairman from Sri Lanka) and pointed out that chairman can be replaced in 3-5 years.

With regard to Regional meetings, Mr. Kashio pointed out that originally it was planned for two years but in reality meetings were conducted at 3-4 years interval. Dr. Mammen suggested that based on the performance TeakNet can be shifted. Dr. Keogh suggested a Five year period and it was unanimously agreed. Director, KFRI suggested including this in the Bye Law.

With respect to Functioning it was agreed that the present Steering committee members could continue. Dr. Appanah, Chairman recommended to expand the number of Steering Committee members to 9. Research Institutions from Japan and from the countries from the other hemisphere can be included. Mr. Kashio informed that now it is for Asia Pacific region.

Regarding Physical and Financial support, Chairman suggested three points i) to bring more members to Steering Committee ii) to review the fee and make it uniform to developing and developed countries iii) to find out whether private companies can financially support TeakNet.

Mr. Ricardo from Costa Rica agreed to try his level best. Others members from private companies also agreed to try. As to the query from the forum, Dr. Appanah, Chairman also agreed for 10,000 US dollars as FAO’s contribution.

Next item for discussion was on the selection of a Co-ordinator at KFRI for the Teaknet. Dr. Bhat from KFRI was asked to give an account of the initiation of work.

Dr. Bhat gave an account of the work initiated for a Global TeakNet at KFRI. He informed that FAO offered a consultancy programme to KFRI in this regard and KFRI has prepared a Website and a new Logo. He also presented the strength and contributions of KFRI to Teak research and management. Chairman as well as Sri Somaiya, Dr. Daniel and Mr. Kashio suggested to retain the old logo with few modification reflecting scope at global level. In response to the query from Sri Somaiya, Dr. Keogh informed that Teak 21 would collect information and link it to TeakNet.

**Concluding Session**

The concluding session was chaired by Mr. Ramon Carillo, Projects Manager, ITTO and co-chaired by Dr. R. Gnanaharan, Director, KFRI. The panel consisting of the following members drafted the recommendations for discussion and finalisation among the august audience.
POSTER SESSION

Presentation of 20 posters covering various themes of teak productivity, wood quality and farming and in a separate Poster Session promoted the scientific interactions of the Workshop.

All the delegates also enjoyed one-day Field Excursion and cultural programme during the Workshop.

Recommendations of the Regional Workshop

Preamble
Teak excites more interest among the general public than any other tropical hardwood for its versatile wood with sterling properties. The rapid expansion of the teak plantations, however, poses a risk of undermining its reputation in global market place because of questionable promises in terms of growth rates and economic returns and wide variations in wood quality with the net effect of reducing the prices and therefore the financial viability of teak planting programmes. To avoid this, teak growers, at the community and industrial levels, must ensure that the wood they produce is of the highest possible quality, which will mean choosing the right sites carefully, using good genetic stock, employing optimal rotation cycles and appropriate silvicultural, processing and marketing techniques.

Considerations
Knowledge of performance and behaviour of teak wood products of planted forests/clonal trees of shorter rotation including agroforestry and home garden forestry sectors is still inadequate in the context of sustainable tropical forest management (SFM). Appropriate steps need to be taken for refining and adopting up-to-date technology for application in realistic field conditions involving seed technology, tree genetics, silvicultural practices, agroforestry systems, protection, harvesting, processing, product development, value addition and marketing. These steps will help consolidate and strengthen the entire teak sector.
Recommendations

Policy & finance

1. Formulate appropriate (sub) policy on teak within the national forests, landuse, industrial processing and socio-economic policies ensuring sustainability and the development of an enabling environment for the long term security of investments.
2. Establish and implement a comprehensive system of planning (involving long, medium and short term plans; and sites/locations, systems and market) for teak resource development.

Wood property analysis

3. Enhance the knowledge base of the wood properties and machineability of short rotation plantation teak - including those grown outside forests (ToF) - so as to ensure that they are processed within the acceptable tolerances of other tropical timbers.

Processing Technology

4. Develop new/innovative conceptual models for teak processing industries based on Best Available Technology (BAT) and the experiences from other industries.

Marketing

5. Develop common grading systems to support vibrant teak sector for the value-added processing of plantation teak wood. Develop market information system for collection, collation and dissemination of teak trading volume and price information

R & D and Training

6. Evaluate, document and disseminate R & D findings
7. Promote tree improvement through:
   - Globally coordinated R& D and
   - Facilitating process of exchanging genetic materials.
8. Appraise the processing technology in use in the context of the new developments in research and transfer to the field.
9. Conduct comprehensive socio-economic studies of teak under different technological systems as a means to attract investment flows.
10. Undertake growth and yield studies by consolidating data from international network of sample plots.

Code of Best practices

11. Develop and promote sustainable practices for teak wood production and utilization codes (social, environmental and economic)

International cooperation and coordination/networking

12. Strengthen regional and international cooperation, collaboration and co-ordination in teak development with special emphasis on human resource development.
13. Support KFRI, one of the lead institutions, to host the secretariat of TEAKNET and establish linkages with other national, international and NGO networks in collaboration with FAO and ITTO.
14. Identify and analyse unsolved and emerging problems (both technical and non-technical) and initiate and implement measures to address them adequately in a coordinated and collaborative manner.

15. Prepare and submit the regional projects to international donor agencies in thrust areas, viz. processing and marketing, productivity/genetic improvement and social/ecological/policy issues.

Workshop Participants
Inaugural Session of the Workshop

Lighting of lamp by Mr. S. Regupathy Hon’able Minister, Govt. of India (Left)
Welcome Address by Dr. E P Yesodharan, Exe.Vice Prsident, KSCSTE (Right)

Dr. R. Gnanaharan, Director, KFRI briefing about activities of KFRI (Left)
Mr. Rajaji Mathew Thomas, MLA delivering presidential address (Right)

Mr. Hiroshi Nakata, JICA, Japan giving addressing on behalf of ITTO representative (Left) ; Dr. K M Bhat proposing vote of thanks (Right)
Glimpses of the Workshop

Satellite Meeting of TEAKNET

Chairman and Co-chair conducting session

View of August audience

Cultural Programme- Traditional Dance of Kerala – Kathakali