

## A Report from the Third International Wood Science Symposium: “Sustainable Utilization of Forest Products: Socio-Economical and Ecological Management of Tropical Forests”

**Tsuyoshi Yoshimura, WRI, Kyoto University**

Following the two successful seminars, 1996 in Uji, Japan and 1998 in Serpong, Indonesia, The Third International Wood Science Symposium as the Core University Program which was sponsored by Japan Society for the Promotion of Science (JSPS) was held on November 1-2, 2000 at Uji Campus of Kyoto University with a main theme of

“Sustainable Utilization of Forest Products: Socio-Economical and Ecological Management of Tropical Forests”. The total number of papers presented was 93, including 2 keynote lectures, 2 invited papers and 89 voluntary papers, and approximately 140 scientists participated in the symposium. Although the majority of the participants were Japanese and

Indonesians, it was remarkable that scientists from other countries (Malaysia, Thailand, Philippines, Korea, China, Canada, Brazil and France) gathered for the symposium to share the current results of the investigations.

After the opening greetings by the coordinators, Prof. Masaaki Kuwahara, Director of WRI, Kyoto University and



*Symposium Opening: A greeting from Prof. Masaaki Kuwahara*



*A keynote lecture by Prof. Dodi Nandika*

Dr. Achiar Oemry, Head of R & D Center for Applied Physics, LIPI, the presentation of papers was started by the two keynote speakers. Prof. Dodi Nandika of Bogor Agricultural University delivered a lecture on the title of "Foraging population and territory of two economically important termites in Indonesia", focusing on the biology of two economically important termites in Indonesia, *Coptotermes curvignathus* and *Schedorhinotermes javanicus*, and referring to the current and future strategies for their control with many beautiful slides. Prof. Kohei Komatsu of WRI, Kyoto University, gave a lecture on "Research and development of moment-resisting joints for glulam frame structures". His outstanding works exemplified by

application of his theory to large-scale wooden constructions and bridges were comprehensively explained to the audience. Their intelligent and interesting talks with humors promoted the hot discussions between the speakers and the floor.

Because too many papers to presented at the same auditorium, two parallel sessions were held in two separate conference rooms: Wood Material Science Session in Mokushitsu Hall (Wood Composite Hall) of WRI and Wood Biomass Technology/Wood Bioscience Session in Seminar Room of Chemical Research Institute. The numbers of presentations for each session are 44 for Wood Material Science (including 2 invited presentations) and 47 for Wood

Biomass Technology/Wood Bioscience, respectively. The well-balanced presentations clearly show not only research efforts of participants in both fundamental and applied fields but also the rapid expanding of a wide variety of collaborative researches in the different fields.

Both invited lectures were delivered in Wood Material Science Session. The first invited presentation was on the subject entitled "Research and development for the evolving Canadian wood composites industry" by Dr. Chum-Ping Dai of Forintek, Canada Corp. He summarized research topics in Forintek Canada Corp. concerning with 1) steam injection pressing for LVL, 2) MDF pilot scale facility, 3) bark board products and 4) computer process modeling. The second one was on "Steam exploded binderless board manufacturing from sweet bamboo and its fiber structure" by Dr. Nikhom Laemsak of Kasetsart University, Thailand. In tropical countries a renewed interest in using bamboo has been increasingly greater these days for the economical benefits of the bamboo cultivation. He comprehensively outlined the recent work on binderless boards manufactured with steam exploded fiber of sweet bamboo in Thailand.

During the period of symposium, many personal/unofficial meetings were held in the Venue. For instance, during lunchtime, free discussions were coordinated by Prof. Mikio Shimada, Chairman of the Committee of the International Academic Exchange of WRI, Kyoto University. It was a good opportunity for foreign participants to exchange the information on hard- and soft-wares for research activities.

The honorable happening occurred on the first day. Dr. Numahmudi Ismail, The Minister of Forestry, Indonesia, attending the ITTO Conference in Yokohama, requested to join the symposium. Dr. Ismail visited the Venue (Mokushitsu Hall) and talked with Indonesian scientists and students for encouraging the research works in Japan. Dr. Ismail also attended the banquet party held in Daigo Plaza Hotel with his wife, and made a speech for promoting the collaboration among Asian countries in the field of wood science.

The banquet party was fantastically commemorative. Together with frank talking each other, many Indonesian scientists performed their excellent singing and dancing. It reminds us of the wonderful dance party which had been held in the banquet at the last seminar in Serpong.

FY 2000 is the fifth year in the JSPS



Conference room in Mokushitsu Hall



Discussion in Wood Biomass Technology/Wood Bioscience Session

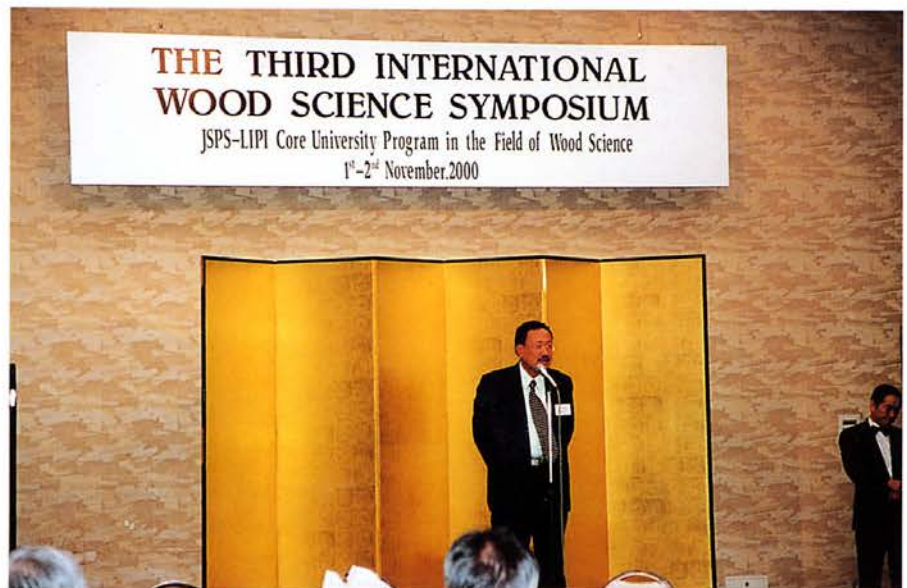


*Dr. Numahmudi Ismail (center) and the*

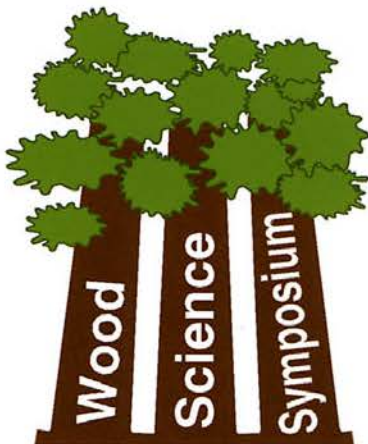


Core University Program in the field of wood science coordinated by WRI, Kyoto University and RDCAP-LIPI, Indonesia, and the year for midterm evaluation of the program. Nineteen Japanese institutions, eighteen Indonesian institutions and one Malaysian institution are now joining the program with more than 170 scientists. Fortunately, many scientists from abroad other than Indonesia and Malaysia also attended the symposium and exchanged the information on research activities. Through the discussion in the symposium the participants reconfirmed the importance of researches on wood and wood-based materials in Asia to achieve a sustainable utilization of forest products.

We, all, are sure that 21st Century is a century of forest resources.



*Dr. Achiar Oemry' s speech in Banquet Party*



*A snap-shot in Banquet Party*

## Faculty of Forestry, Universiti Putra Malaysia —Education and Research in Wood Science—

Eee Ding Wong, UPM, Malaysia

Universiti Putra Malaysia (UPM, formerly Universiti Pertanian Malaysia—literally means Agricultural University of Malaysia) was established in 1971 with 3 founding faculties, i.e. Faculty of Veterinary Science, Faculty of Agriculture and Faculty of Forestry. The Faculty of Forestry at UPM is the first in Malaysia that provides professional training in forestry with Bachelor of Science in Forestry. The first intake of students was in June, 1973. In 1974, there were 9 academic staff members at the faculty, 4 of whom were contract lecturers from foreign countries.

Today, the faculty is divided into Department of Forest Management and Department of Forest Production. The former offers two fields of specialization, namely Forest Management and Forest Recreation, while the latter offers specialization in Forest Production. Wood science comes under the Department of Forest Production. Currently there are 44 academic members at the Faculty. Out of the 22 academic members in the

Department of Forest Production, only 10 are working on forest products.

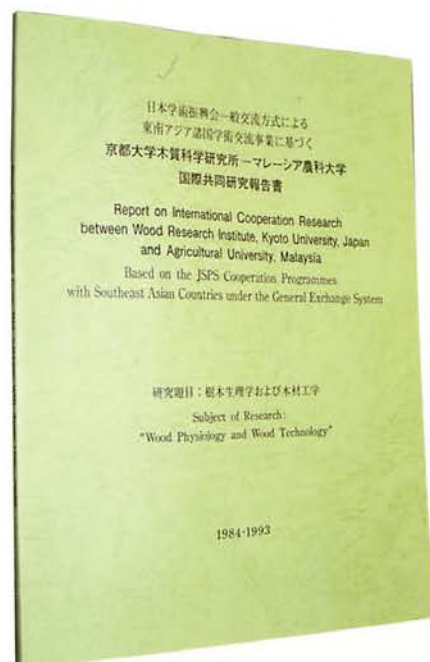
The mission of the faculty is to become the center of excellence for education in tropical forestry, contributing not only to the progress of mankind and knowledge, but also the development and prosperity of the nation. To achieve this mission, the faculty has drawn the following objectives:

- i. to meet the requirements of professional human resource in forest management, wood-based industries and forest recreation/eco-tourism by producing high quality and competitive graduates;
- ii. to produce relevant and up-to-date

research findings which can contribute to sustainable forest management, development of forest-based industries, and forest recreation/eco-tourism sector;

- iii. to offer quality and relevant professional services in the progress and dissemination of knowledge in forest management, wood-based industries, and forest recreation/eco-tourism.

Currently, the Faculty offers 3 levels



of education in forestry, namely Diploma of Forestry, Bachelor of Forestry Science, Postgraduate-Masters of Science (MS) and Doctors of Philosophy (PhD). For wood science, a student taking the 3-year Diploma course can choose to take an elective option on Forest Products, whereas a Bachelor degree student has the flexibility to minor in Wood Science and Technology, or Wood-based Industries Management.

In 2000, the MS (Wood Industries Technology) program has been initiated to provide opportunities to the industrial personnel to get a postgraduate degree by attending the courses during the weekends for 12 months. To address the specific requirements of professional personnel in wood science, the Faculty is in the process of formulating and promoting a more specialized degree entitled "Bachelor of Wood Science and Technology", which provides 3 different minors in Wood Composites Technology, Pulp and Paper Technology, and Furniture Manufacturing and Molding Technology.

The areas of wood science research



Dr. Eee Ding Wong

embarked on by the members at the Faculty cover fundamental science (wood anatomy and growth characteristics), lumber processing (machining, seasoning, protection and treatment), composites (production technology, resin adhesives, finishing), pulp and paper, timber engineering and design, and productivity and management of wood-based industries.

In terms of research, the Faculty has been working very closely with the various faculties in UPM, and also other forest related agencies and institutions, both at the national and international levels. Among the local agencies and institutions which have close linkage with the Faculty are the Forest Departments, Forest Research Institute of Malaysia (FRIM), Malaysian Rubber Board, Malaysian Palm Oil Board, Malaysian Timber Council, Malaysian Timber Industrial Board, Construction



*A snap-shot in the collaborative joint research meeting between UPM staffs and Japanese scientists (Faculty of Forestry, UPM) (Photo by T. Hata)*



*A Scenery of Forest Research Institute of Malaysia (FRIM) (Photo by T. Yoshimura)*

Industrial Development Board Malaysia, Sarawak Timber Association, Malaysian Panel Manufacturers Association, Malaysian Institute for Nuclear Technology Research MINT), and Malaysian Furniture Association. In addition to the above, local universities such as Universiti Malaya, Universiti Sains Malaysia, Universiti Kebangsaan Malaysia, Universiti Teknologi Malaysia are also working closely with the Faculty.

From 1984 to 1993, the Faculty was involved in the JSPS Cooperation Programs with Southeast Asian Countries under the General Exchange System, and substantial research work was conducted in collaboration with the Wood Research Institute (WRI), Kyoto University. In March 2000, WRI, Kyoto and the Faculty of Forestry, UPM has signed a Memorandum of

Understanding to facilitate further collaborative research in wood science. One of the on-going international collaborations is the CICHE program (Wood Utilization) with University of Wales, Bangor.

In the early years, wood science research at UPM focused mainly on the timber characterization, processing and utilization of the indigenous mixed tropical hardwood species available in the natural forests. Since the logs were of relative high quality, the emphasis then was mainly on timber seasoning, treatment, sawmilling, gluing, veneer and plywood production. In the mid 1970s, substantial amount of work was conducted on rubberwood (*Hevea brasiliensis*), a timber salvaged at the end of economic cycle of rubber latex extraction. In addition to the fundamental characterization, lumber

seasoning and treatment, a lot of attention was given to the aspect of optimum utilization of low grade, small diameter logs, which led to the active research on composites such as particleboard and fiberboard.

In the 1980s, the global concern over the depletion of natural forest, and fear of timber shortage has led to the introduction of fast growing and multipurpose timber species such as *Acacia* spp. (mainly *A. mangium*) and hybrids, *Gmelina arborea*, *Eucalyptus deglupta* and *Paraserianthes falcataria*. In addition, the processing properties and suitability of other lesser-used species for industrial exploitation were also investigated. While continuous efforts are being made to promote and examine the utilizations of conventional and non-conventional timber species, since the mid 1980s, "new" lignocellulosic materials such as oil palm biomass, have opened another phase of research in wood science. Lately, kenaf fibers has become another non-conventional material which is of great interest for composite production.

Other than the conventional processing technology and resin adhesive modification (low formaldehyde emission urea formaldehyde), more sophisticated approach began to be introduced in 1990s. Image analysis system was set up to provide a more detailed and accurate study in wood anatomy; chemical modification of timber (e.g. acetylation), computer-aided engineering and design, and plastic/lignocellulosic composites were also introduced.

The current research activities at the Faculty cover a very broad spectrum, which include: analysis of growth stresses in tropical fast growing trees;

conversion of tropical hardwood into oriented strand board, structural LVL and glulam; production of plastic/lignocellulosic and cement composites from oil palm biomass; utilization of bamboo for structural plywood production; fire-retardant and preservative treatments, and eco-design/engineering analysis of timber structures, among others. Besides the conventional laboratory testing, the current product evaluation approaches also attempt to introduce in-grade testing and real weather exposure tests for composite products. The above-

mentioned research efforts not only involve the members at the Faculty, more often than not, these research projects are collaborative work among organizations at both national and international levels.

On top of education and research, members at the Faculty are also providing consultation to the industries, and actively involved in the formulation of National Standards for various wood-based products. In May, 1998, Biocomposite Technology Centre (BTC) has been set up under the Institute of Bioscience, UPM. The

establishment of this Centre is an indication of the achievement of UPM in wood science, and its determination to continue to play an active role in wood science research. With the establishment of this center, more vigorous work is expected to be conducted on wood science research.

The Faculty of Forestry, UPM welcomes inquiries and proposals for further education and research collaboration. For further details, please contact: Faculty of Forestry, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia.

As described by Dr. Wong, University Putra Malaysia (formerly Universiti Pertanian Malaysia) and Wood Research Institute, Kyoto University have been conducted cooperative joint research from 1984. To promote the wide-range cooperation between WRI and Malaysian institutions in the field of wood science, MOU between Universiti Sains Malaysia (USM) and WRI is now under discussion. The MOU will be signed in March 2001. (Tsuyoshi Yoshimura, WRI, Kyoto University)



*A meeting on MOU between USM and WRI, Kyoto University (Photo by T. Yoshimura)*

### From the editorial board

## Correction in International Newsletter No.7

There was an editorial mistake in the last Newsletter (No.7). The last paragraph in the news "A Trip to UPM, Malaysia for Exchange of MOU" by Prof. Mikio Shimada (page 3) was incomplete, and should be followed by the acknowledgement to Dr. Eee Ding Wong. The complete paragraph and the acknowledgement are as follows:

"As a result of our trip, we can conclude that integrative joint research work supported by the JSPS Core University Program will be certainly accelerated among the three countries to make fruitful products finally.

Before closing our brief trip report, we are grateful to Dr. Eee Ding Wong for her kindness while our staying in KL."



## Proposals for Future Projects FY2001-2003

Indonesian Institute of Sciences in the field of wood science, two new projects are proposed to start in FY2001.

Under the JSPS Core University Program between Wood Research

Institute of Kyoto University and the R & D Center for Applied Physics of

### *Title:*

**Anatomical Characteristics and Wood Quality of Tropical Plantation Trees for Quality Timbers (FY2001-2003)**

### *Principal Investigators:*

**Prof. Tadashi NOBUCHI**

Graduate School of Agriculture, Kyoto University

**Dr. Mohd. Hamami SAHRI**

Faculty of Forestry, University Putra Malaysia

### *Research Organization:*

**Minoru FUJITA**

Graduate School of Agriculture, Kyoto University

**Zaidon ASHAARI**

Faculty of Forestry, University Putra Malaysia

**Togor L. TOBING**

Faculty of Forestry, Bogor Agricultural University

**Imam WAHYUDI**

Faculty of Forestry, Bogor Agricultural University

### *Purpose of the Research Project:*

Timber resources in Tropical countries are coming to depend on the plantation forests. Although high-grade plantation timbers such as Teak, Agathis etc. have been produced these days, no detailed study on the relationship between planting methods and characteristics of timbers has been conducted so far. The purpose of this project is to obtain the fundamental knowledge on the anatomical characteristics of high-grade plantation timbers to develop a novel planting method in sustainable utilization.

### *Significance and Expected Results:*

The elucidation of the relationship between tissue formation and heartwood formation, the anatomical characteristics of un-matured and

matured timbers, and the formation of low-grade timbers such as compression wood in tropical plantation trees would contribute to the development of the advanced methods of plantation from the nursing stage to the harvesting stage in tropical countries.

### *Title:*

**Biodegradation Control for Tropical Woods using Post-CCA Preservatives and Assessment of Their Effectiveness based on Anatomical Features (FY2001-2003)**

### *Principal Investigators:*

**Prof. Ikuo FURUKAWA**

Faculty of Agriculture, Tottori University

**Dr. Sulaeman YUSUF**

R & D Center for Applied Physics, LIPI

### *Research Organization:*

**Suichi DOI**

Institute of Wood Technology, Akita Prefectural University

**Takeshi FURUNO**

Faculty of Science and Engineering, Shimane University

**Yuji IMAMURA**

Wood Research Institute, Kyoto University

**Tsuyoshi YOSHIMURA**

Wood Research Institute, Kyoto University

**Dodi NANDIKA**

Faculty of Forestry, Bogor Agricultural University

**Musrizal Muin**

Forestry Department, Hasanuddin University

**Pipin PERMADI**

Forest Products Research Center, Indonesia

**Sofyan M. SASA**

Faculty of Forestry, Winaya Mukti University

### *Purpose of the Research Project:*

In Indonesia, it is important to apply the post-CCA preservatives for protecting wood degradation caused by termite and fungi. The purpose of the project is to assess the performance of post-CCA preservatives by the field trials in Indonesia, and to observe the anatomical (morphological) changes of the treated woods deteriorated by both of fungal and termite attacks. Establishment and proposal of the evaluation criteria and the guidelines for assessment of biological durability of fast-growing plantation woods treated by the newly developed preservatives against fungi and termite attacks are also aimed.

### *Significance and Expected Results:*

Micromorphological aspects of tropical woods deteriorated by fungi or termites will be clarified by means of various microscopic techniques, and the obtained knowledge on biodeterioration characteristics of the treated woods will become useful indices (indicators) for assessing both degree of degradation and performance of the post-CCA preservatives.



## On – going Research Projects

### Development of Optimum Machining and Drying Methods for Fast-Growing Trees and Less-Using Species

*Principle Investigators:*

**Prof. Kazuo HAYASHI**

School of Agriculture, Ehime University

**Dr. Edi S. BAKAR**

Faculty of Forestry, Bogor Agricultural University

### Softening Behavior of Bamboo and Its Practical Application

*Principle Investigators:*

**Prof. Misato NORIMOTO**

Wood Research Institute, Kyoto University

**Dr. Wahyu DWianto**

R & D Center for Applied Physics, LIPI

### Development of Integrated Technology on High-Performance Utilization of Tropical Forest Resources

*Principle Investigators:*

**Prof. Yuji IMAMURA**

Wood Research Institute, Kyoto University

**Dr. Wiwik S. SUBOWO**

R & D Center for Applied Physics, LIPI



### Composting of Organic Wastes into Multifunctional Recyclates

*Principle Investigators:*

**Prof. Minoru TERAZAWA**

School of Agriculture, Hokkaido University

**Dr. Neni SINTAWARDANI**

R & D Center for Applied Physics, LIPI

### Studies on the Effects of Silvicultural Conditions to the Wood Qualities of Plantation Teak

*Principle Investigators:*

**Prof. Takashi OKUYAMA**

Graduate School of Bio-agricultural Sciences, Nagoya University

**Prof. Yusuf Sudo HADI**

Faculty of Forestry, Bogor Agricultural University

### Zero Emission Processes for Oil Palm Utilization

*Principle Investigators:*

**Prof. Shuichi KAWAI**

Wood Research Institute, Kyoto University

**Dr. Bambang SUBIYANTO**

R & D Center for Applied Physics, LIPI

### Biochemical Analysis of Organic Acid Metabolism of Symbiotic and Saprophytic Basidiomycetes occurring in Forest Ecosystem

*Principle Investigator:*

**Prof. Mikio SHIMADA**

Wood Research Institute, Kyoto University

**Dr. Yadi SETIADI**

Inter University Centre for Biotechnology, Bogor Agricultural University

### Behaviors of Extractives during Pulping and Bleaching of Tropical Plantation Woods

*Principle Investigator:*

**Prof. Gyosuke MESHITSUKA**

Graduate School of Agriculture and Life Sciences, The University of Tokyo

**Dr. Wasrin SYAFII**

Faculty of Forestry, Bogor Agricultural University



### The Committee of International Academic Exchange

M. Shimada (Chair), T. Itoh, T. Watanabe, T. Yoshimura, K. Komatsu and M. Inoue

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