

International Newsletter

Wood Research Institute



Kyoto University, Japan

Views of the New Japanese Chairman of the International Committee of WRI

Prof. Kohei KOMATSU



First of all, I would like to say thank you to Professor Shimada for two years of hard work as the chairman of the Committee on International Academic Exchange, WRI, Kyoto University.

It is my great pleasure to express my first view in this International News Letter issue 9 on the JSPS-Core University Program as the third chairman of this committee. Until I took the chairman's responsibility, I knew almost nothing about JSPS-Core University Program although previously attended the second international wood science seminar held in LIPI, Serpong- Tangerang, Indonesia. Speaking honestly, I was in a little bit of a sight-seeing mood at that time. Now, however, I have learned much more about the JSPS-Core University Program and the substance of the cooperative research projects through the midterm report to JSPS issued by Prof. Shimada in 2001.

According to my understanding, I have already suggested a new principle how cooperative research project should be proposed and how they should be selected. As my proposal has already been presented on the WRI web site, I suppose many people have already read it on the Internet and have understood the principle. What I wanted to stress in

my proposal is that cooperative research projects are the most important part of the JSPS-LIPI Core University Program. Thus, in order to obtain an abundance of fruitful results from this project, cooperative research should be carried out by researchers who have the potential to perform research project with a strong passion and sufficient scientific background and final research projects should be selected by objective unbiased

and rigorous judgments of the Committee on International Academic Exchange, WRI, Kyoto University.

Finally, I hope that an abundance of fruitful research results and useful collaborations of both Indonesia and Malaysia with Japan will be generated during the latter five-year period of the Core University Program.

My Impression and View of the 4th International Wood Science Symposium 2002 in Indonesia

Dr. Sulaeman YUSUF

Konn-nichiwa mina-sama

It is my great pleasure to spend with the Core University Program as Sub-Coordinator helping Dr. Achiar Oemry with administrative works. I would like to share my impression of my first visit to Japan as well as discussing the next 4th Int. Wood Science Symposium that will be held in Indonesia and the change of the Composites Material Laboratory to



the Research Center for Biomaterial.

In 1987, I visited Japan (Kyoto) for the first time. It was the first time for me to go abroad under the General Exchange Program; my second visit was in 1988. I had many problems, especially with Japanese food, language and other aspects of culture shock. Almost everyday I ate chicken "karage" because that food is similar to Indonesian food. Because of that, some friends called me "chicken man". Thereafter in 1990, I received a M o n b u s h o scholarship for the Masters and Doctor Course until 1996 under supervision of Prof. Munezoh Takahashi and Prof. Yuji Imamura. They helped me experience many aspects Japanese culture like Karaoke, Japanese food and others as well as supervising my academic pursuits. Now I like foods such as sukiyaki, sushi, misosiru, kare, soba, reimen, udon, even "natto", although I still cannot eat "Funazushi" (Fermented fish). I would like to thank Prof Takahashi and Prof Imamura for their hospitality while advising me until I got my doctorate. Those were my impressions of Japan.



Now, I would like to inform and remind everybody that our Core University Program in the field of Wood Science has already completed the first 5 years and now we are entering to the second 5-year period. During the last 5 years, many papers were published in local or international journals and we have already held three Symposia. We hope that in the next second five years, more publications will be published in top international journals like "Science" and "Nature". We also hope that more research will be done in Indonesia. We can do considerable research in Japan because there are sufficient facilities, however in Indonesia we do not yet have good facilities. This is a serious problem.

The 3rd International Wood Science Symposium was held in Kyoto in November 2000 and the 4th International Symposium will be held in Serpong, Indonesia in 2002. The place of symposium will be in PUSPIPTEK, Serpong, West Java, Indonesia, the date of symposium will be in mid of September. We are planning to have 2 days of seminar on around middle of September and 2 days of excursion to Bali. We hope all members of the Core University Program

can join this symposium.

This year, there was a reorganization of the Indonesian Institute of Science (LIPI), some institutes merged, while others were divided. Composite Material Lab. (my lab) is one of the laboratories that will be changed to the "Research Center for Biomaterial". In the future if a new RCB is established, the activity will be focused on efficient utilization of natural resources especially forest

resources for sustainable forest management. I hope the RCB will be successful and able to perform more joint research projects with more research institutes or universities in Japan.



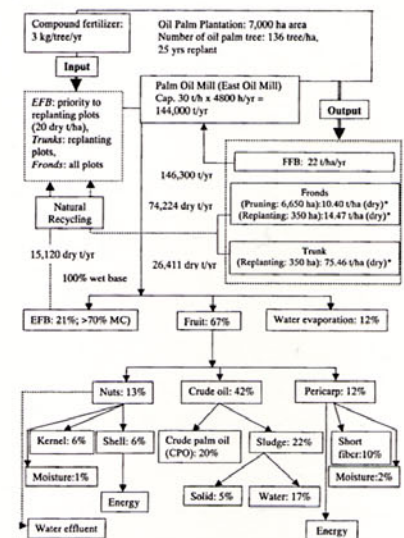
A cooperative research project in JSPS core university program Zero Emission Processes for Oil Palm Utilization(1999-2001) Prof. Shuichi KAWAI

Oil palm residues such as trunks, fronds, and empty fruit bunches should be converted into different types of materials for more effective utilization of lignocellulosic materials and for the reduction of pollutive substances in the regional area.

This project aims to develop the total system for the utilization of oil palm residues; those are 1) the mass and energy flow analysis for the total system in oil palm utilization and its optimization for the establishment of the zero-emission process, and 2) development of new lignocellulosic materials, including the conversion into pulp and paper, saccharification, and carbonization of these residues.

Thus, the project is organized by 6 Japanese researchers, 6 Indonesian researchers and 1 Malaysian researcher from biomaterial and biotechnology fields. Part of this project has been supported by a Grant-in-Aid for Scientific Research from the Ministry of Education, Science, and Culture of Japan.

As contributions, one paper on oil palm cement bonded particleboard was



*Mass flow in palm oil mill;
Golden Hope Bhd., Malaysia. Mass
flow in palm oil mill; Golden Hope Bhd.,
Malaysia*

published in the *Journal of Wood Science* in 2001. Another paper is to be published this year in the same journal. The total of 8 papers have been published in the

proceedings of international conferences.

Significant results obtained are as follows;

1) *Case studies of mass flow in a palm oil mill and an oil palm plantation (See Fig. 1)*

Oil palm mills with plantation sites in Indonesia and Malaysia were chosen as case studies. The mass and energy flows were analyzed to optimize the oil palm utilization in order to establish the zero-emission process. The results show that empty fruit fibers can be converted into composite products, while the trunk and fronds fibers should be left at the plantation site as natural composting.

2) *Preparation of empty fruit bunch fibers by biological treatment (See Fig.2)*

The biological treatment of empty fruit bunches is now being investigated for the preparation of the fibers. The

identification and screening of fungi in the natural degradation process is necessary for preparing high-strength oil palm fibers with low-energy consumption.

3) *Development of composite wood products from oil palm fibers*

Cement bonded board from oil palm was successfully manufactured using accelerators for setting or carbon dioxide curing system. A new mechanical orientor was developed for manufacturing oriented medium density fiberboard (MDF) and oil palm fibers were applied. The results show that the product provides high performance in both mechanical and dimensional properties.



Observation in the natural degradation process of empty fruit bunches at the oil palm plantation site. mill; Golden Hope Bhd., Malaysia

A cooperative research project in JSPS core university program Softening Properties of Bamboo and Their Applications (1999-2001)

Dr. Toshiro MOROOKA

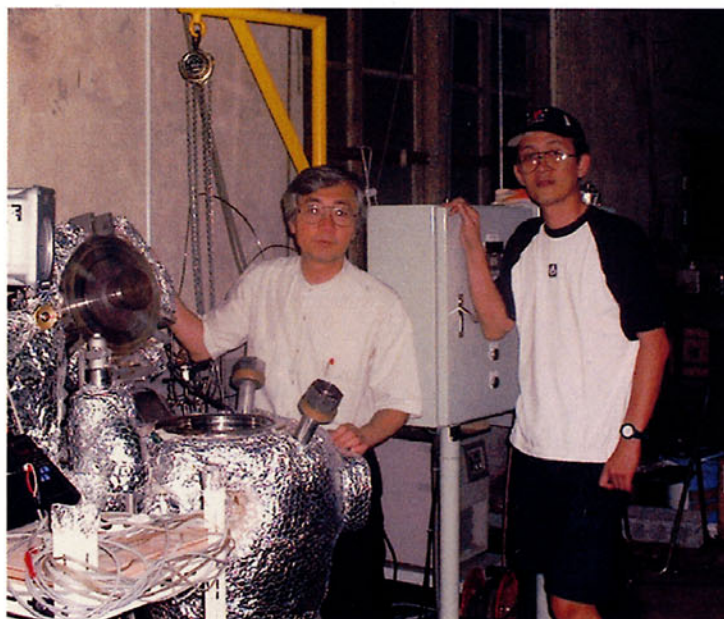
In Southeast Asia including Indonesia, there exists a large amount of bamboo resources. The utilization of bamboo as a substitute for wood is desirable considering the steady decrease in forest in these regions. The use of bamboo has been restricted mainly to craft objects. If the strength properties of bamboo are improved remarkably, a new use of bamboo may be found.

This research project investigated methods of enhancing the strength of bamboo by radial compression during its optimal softening condition. It is well known that the heating dry bamboo is effective for achieving a large deformation and fixation. However, the effect of moisture on softening properties of bamboo has never been clarified.

In this investigation, the stress-strain relationship and stress relaxation in radial compression for three bamboo species (mousou: *Phyllostachys heterocycla*, gombong: *Gigantochloa pseudarundinacea* and

tali: *Gigantochloa apus*) and two wood species (sugi: *Cryptomeria japonica* and shide: *Carprinus* spp.) were measured under both dry and wet conditions at temperatures from 20 to 200°C.

A testing machine with a built-in autoclave and a load cell capable of resisting high temperature steam were used to obtain measurements under wet condition at high temperatures.



A picture of the experimental setup

In the stress-strain diagram, all dry bamboo species examined were brittle below 100°C, but softened remarkably above 100°C. The yield stress for both mousou and tali reduced to one-tenth when temperature increased from 20°C to 200°C. Such a large reduction of the yield stress was not observed in dry sugi and shide. Strain recovery (Sr) over time was determined stress relaxation measurements for dry bamboo and wood. The Sr of tali decreased below 10% after 1hr at 200°C. Tali showed a remarkable reduction in Sr over a short time compared with that of sugi.

In the stress-strain diagram, the stress of wet gombong and tali increased gradually up to a large strain level without showing the yield point. In the stress

relaxation measurement, wet gombong showed a large stress decay of one-thirty in the temperature range between 20°C and 200°C. However, both mousou and tali showed almost the same extent of stress decay under dry and wet conditions. Among bamboo species examined, there was no significant difference in Sr over time, although different softening behaviors were observed. The deformation of all wet bamboo species examined was almost perfectly fixed at 10min at 200°C.

Based on these findings, we plan to develop a rapid production technique using compressed bamboo with very high strength properties.

Signing of MOU between the School of Biological Sciences, Universiti Sains Malaysia (USM) Dr. Tsuyoshi YOSHIMURA



The signing ceremony of MOU.

Prof. Mashhor Mansor (left), Dean of School of Biological Sciences, USM, Prof. Dato' Dzulkifli Abdul Razak (center), Vice Chancellor of USM, and Prof. Misato Norimoto (right), Director of WRI, Kyoto University.

Penang, the "Pearl of the Orient", is an island located along the northwest coast of Malaysia. Universiti Sains Malaysia (USM), one of the leading universities in Malaysia, has three campuses in the country, and the main office is in Penang. After nearly one year's discussion, the School of Biological Sciences, USM in Penang and Wood Research Institute, Kyoto University have reached an agreement outlined in the MOU (Memorandum of Understanding) to promote academic collaborations in the field of wood science.

On 24 July 2001, Prof. Mashhor



A snapshot near UPM campus.

Prof. Misato Norimoto (left), Fruits of oil palm (center), and Dr. Ee-Ding, Wong (right)

Mansor, Dean of School of Biological Sciences, USM and Prof. Misato Norimoto, Director of Wood Research Institute, Kyoto University signed the MOU witnessed by Prof. Dato' Dzulkifli Abdul Razak, Vice-Chancellor of USM. The MOU outlines the following general forms of cooperation:

- Exchange of information including, but not limited to, exchange of library materials and research publications.
- Joint research activities.
- Visit by and exchange of graduate and undergraduate students for study and research.
- Visit by and exchange of staff for research, teaching and discussion.

After the ceremony, Prof. Norimoto delivered a short lecture on research activities in WRI to the USM staffs and students. More than 30 peoples joined the lecture, and Q & A was truly helpful to imagine the future collaboration between USM and WRI. We were given the chance to make a short trip in the research facilities of the school, particularly the "Vector Control Research Unit", where practical joint research on termites has already started. The unit has conducted research on pests and pathogens, and has received high international ratings from WHO Programs. At the unit, we were pleased to have a special "Durian Party" with the staff, tasting various kinds of

Penang's durians as well as many other fruits. There is no word to explain this party other than "Fantastic!".

We had an another purpose on this trip down to Malaysia, that is, to visit the Universiti Putra Malaysia (UPM) to talk with staff about the promotion of JSPS-Core University Program. UPM had joined the program last year as the first institution from Malaysia. The staffs were very keen to join the program, and asked many practical questions about applications for new research projects. After eating the "Banana leaf curry", we drove around the UPM campus, and could see oil

palm plantation with harvested fruit along the road.

At the end of this report, we would like to express our great thanks to USM staff and UPM staff, particularly Dr. Chow-Yang, Lee and Dr. Ee-Ding, Wong, respectively, for their kind help and hospitality during our stay. We are sure that further collaboration between Malaysian institutions and Japanese institutions will be promoted increasingly by the MOU agreement, but the MOU is only the first step, and the dream will only be realized by high quality joint research works.



"Durian Party" in Vector Control Research Unit in USM. Dr. Chow-Yang, Lee (left), Prof. Misato Norimoto (center), and the author (right).



The Committee of International Academic Exchange

K. Komatsu (Chairman), M. Shimada, T. Hayashi, T. Watanabe, T. Nomura and T. Hata

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