



FRIM IN FOCUS

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This issue's focus

Forests Forever: Deluded Dream Or Sustainable Science?

A Look At Sustainable
Forest Management

- One-Stop SFM Centre • Timber Certification • EIAs • Reduced Impact Logging
- Sound Silviculture • Forest Mapping • Social Forestry • Spoils From Our Soils
- The Fellowship Of The Link • Would You Try Wood? • FRIM Bestsellers

Silviculture

Sustaining Custom-Made Forests

Giving nature a helping hand to boost timber productivity

A NEW method of assessing growing stock after logging to design an adequate potential crop of trees for the next cut is being developed by FRIM.

The proposed method gives silviculturists more options to re-design stand conditions and simulate harvesting until desired stand conditions are achieved.

But these stand conditions must be based on revised limits aimed at reducing the intensity of tree removal which is too drastic at the moment, as well as controlling the threshold level of harvests which currently is not defined.

The revised limits are i) leaving behind 45, and not 32, trees per ha (30-45 cm diameter at breast height or dbh) based on findings that tree mortality is

two percent, and not 0.9 percent per annum, and ii) cutting a maximum of 10 trees per ha.

Also, cutting limits should not be fixed (a minimum of 50 cm dbh for dipterocarps, and 45 cm dbh for non-dips, at present), but be based according to stand conditions. Cutting limits that extract anything from 23.4m³/ha (for

More on page 11

From the Editor

SUSTAINABLE Forest Management (SFM). This buzzword in forestry circles is our focus for this issue, as FRIM's Natural Forest Division evolves into a centre for SFM. (See below)

We look at several aspects of SFM, from timber certification, logging methods and forest mapping to silviculture, social forestry and environmental impact assessments.

All too often research ends at the publication stage. We don't want to be an ivory tower, but to move on from documentation to implementation. And so FRIM is looking to turn more of its set-ups into referral-like centres on other aspects of forestry research to make our findings readily available to clients.

Hopefully, SFM should not mean how to log forests so that the supply of timber can continue forever, but how to log forests in a way that preserves forests the way they were (well, almost). It should not mean simplistic solutions like blanket logging bans that drive us to despoil other people's forests where the law is lax. It should mean nabbing those who commit forest crime and corruption.

A decade has passed since SFM was first formulated in a UN summit on the environment in Rio de Janeiro. But despite international conservation efforts, tropical forests worldwide are shrinking at much the same rate. Perhaps because policies on forest conservation and environmental protection are often a belated response to forest depletion and environmental degradation, and on a scale inadequate to preserve primary forests.

Research rationale, political will, enforcement muscle: a trilogy of essentials for change. And yes, a fourth constant, surely: a miraculous transformation of values.

On a more heartening note: we are encouraged by the many positive comments about FIF's new look and substance, and thank all of you who took the trouble to give us feedback.

One reader, after his congratulatory greetings, commented in his e-mail: "Reading your editorial,... I was struck by the irony of thinking you could have saved money by using a cheaper grade of paper!... I wondered if FRIM was doing any work in alternative sources of newsprint... the worst thing about being a writer is knowing we kill trees."

Turning oil palm fibres into paper, he suggests, might be worth pursuing, after reading last issue's article (Oil Palm Cement, Anyone?). "If so, I could score an environment-friendly and patriotic marketing device for my next book," he added, when he declares it to be "printed on genuine recycled Malaysian wood pulp."

Good news. Next year, FRIM is looking into setting up a pilot paper plant using oil palm pulp, and FIF hopes to report on this development.

The editor wants to record her gratitude to Dr Chan Hung Tuck for vetting and proofreading this and subsequent issues of FIF from now on. **FIF**

Research Dissemination

Research With A Cause

Research for the marketplace has become FRIM's mantra. For a start, we are making available accumulated research findings on SFM

RESearch, technologies, expertise and services on sustainable tropical forest management are being streamlined and packaged for practical application as FRIM plans its centre for sustainable forest management (SFM).

A more holistic, rather than piecemeal, approach to SFM with critical gaps in research identified and addressed, will be the goal of the centre which will cater to loggers, forestry department officials, policy-makers, NGOs, donor agencies, foreign scientists and other interested parties.

"We have a century's worth of research at FRIM which needs to be disseminated," said Ismail Harun, from FRIM's Natural

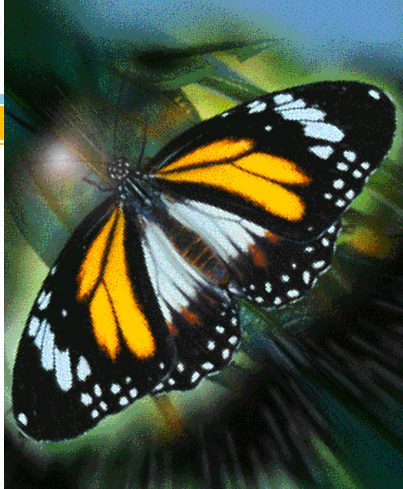
Forest Division where Ismail heads the Mensuration Unit.

The Natural Forest Division is most likely to become the centre as much of the SFM-directed research is concentrated and co-ordinated here, but resources, including manuals, research papers and other publications, will also be compiled from the various FRIM divisions.

The research will be available online via FRIM's website. Direct enquiries to ismail@frim.gov.my.

At the same time, the centre is also making available the expertise of FRIM scientists including consultancies and the provision of training on various aspects of SFM. (See also cover and pages 6-12) **FIF**

DR LAURENCE KIRTON



Cover Photo: Danaus affinis, an endangered mangrove-inhabiting butterfly species that was the subject of a conservation project undertaken by FRIM

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Collaborations

Spoils From Our Soils

A Japanese biotechnology research company signs an MOA with FRIM to investigate the pharmaceutical and health product potential of our soil microflora and fauna

SOIL micro-organisms as a source for developing antibiotics, anti-fungal and anti-viral drugs and health supplements, among other things, will be the subject of a research collaboration between FRIM and the biotechnology firm, Nimura Genetic Solutions (M) Sdn Bhd (NGS).

Various FRIM labs, in particular its tissue culture lab which will be upgraded with a RM2 million injection of funds from NGS, will be used by Japanese scientists to identify, isolate and cultivate these micro-organisms from FRIM's 600-ha forest grounds. Primary chemical tests in the extraction of bioactive compounds will then be done. Both FRIM scientists and those hired by NGS from the various local varsities will work with the Japanese who will also be training and supervising FRIM researchers as part of the Agreement's 'transfer of technology' component.

The RM300,000 MOA agreement between FRIM and NGS, initially for five years, may be extended with the eventual formulation of drugs being done by pharmaceutical giants in Japan and worldwide. FRIM will share in royalties and intellectual property rights in the initial (primary tests) phase and possibly patent rights from the sale of any future products that might arise from the project.

Samples of the extracted bioactive compounds will be duplicated for FRIM labs before they are passed on to drug companies for further development into end products. Work is expected to begin in June.

"We take great pride in complying with the Rio Convention On Biodiversity which requires that a resource country's sovereign right for access to its biodiversity resources be

recognised and that it gets to share in the benefits and profits from research and products developed from them," said NGS managing director and CEO Satoshi Nimura.

He said drug companies worldwide currently conduct tests on natural resources for pharmaceutical products outside the country of origin from which those flora or fauna are collected. "But in our case, most of the research will be conducted here," he added.

Mr Nimura said FRIM's experience in tropical rainforest diversity, its large pool of research expertise and the extensive range of supporting research facilities within its campus are reasons why his company picked the Institute for the collaboration.

FRIM director-general Dato' Dr Abdul Razak Mohd Ali said biotechnology research at the Institute started in 1983 with plant tissue culture. In 1985, FRIM branched into molecular marker technology and then into genetic engineering in the early nineties. In 1995, biotechnology activities in medicinal plants were initiated after the Government identified the Institute as the centre for medicinal plant research.

Under the Eighth Malaysian Plan (2001-2005), the Government announced that biotechnology will become another strategic sector and engine of development in the country. "In response to this call, FRIM is strengthening its activities in forest biotechnology and encourages collaborative R&D programmes with local R&D institutions and the private sector," said Dato' Dr Abdul Razak. **ITP**



Dato' Dr Abdul Razak...
FRIM beefing up its forest biotechnology

Schooled In Garden Flora

Students will learn how to tend gardens of endemic plants within their school compounds once the MOU between FRIM and a property developer comes into effect

"DARK, dirty and dangerous." This is what some students penned in FRIM's visitors' book last

year. They were talking about our forests. Children can be so candid, can't they?

The partnership between FRIM and the Johor Bahru property developer, Country View Berhad to help schools start gardens to inculcate among our young the love for plants, is thus a timely move.

Six schools in Johor and five in Kuala Lumpur have been selected for the project. FRIM will identify and provide selected trees and plants, reading materials and advice in maintaining the gardens, with financial and promotional assistance from Country View.

The RM 200,000 collaboration will also enable FRIM to engage in conservation research, including exploratory expeditions to locate and

assess the status of threatened plants and engage in conservation strategies.

"There is so much out there that we don't know about," said FRIM director-general Dato' Dr Abdul Razak Mohd Ali, referring to the myriad Malaysian flora with horticultural and pharmaceutical potential, among others. Many of these plants may be endangered or even extinct and while conservation research is crucial, funds allocated for this purpose is limited.

"We thus greatly appreciate Country View's involvement and hope that other firms will follow suit," added Dato' Dr Abdul Razak.

FRIM will also provide consultancy services in the landscaping of Country View's developments. **ITP**



YAZIDNYAN

Starting them young... Students learning about our forests from a FRIM staff during a nature trail outing

The Fellowship Of The Link

The forest scientists link, that is. An NGO forms a forestry research network in the Asia-Pacific

WITH over 250 organisations in the Asia-Pacific now involved in forestry research, a storehouse of valuable research has been accumulating. But obviously, so is the duplication of research efforts. This seems a waste in the light of limited research resources.

Thus it was that in 1995, during a meeting of heads of forestry research institutions in Bogor, Indonesia, (including former FRIM director-general Dr Salleh Mohd. Nor), the Asia-Pacific Association of Forestry Research Institutions (APAFRI) was founded to promote the exchange of information, minimize research duplication and facilitate collaborative research among its members.

To date, 60 major research bodies representing 23 countries are members of APAFRI which, since 1998, registered as an NGO in Malaysia with its office at FRIM (an APAFRI member, of course). The body is set to be the Asia-Pacific chapter of the Vienna-based International Union Of Forestry Research Organisations.

One of its major projects, and one which is drawing in the members, is its database of 1.5 million articles to date, sourced from all the major forestry journals. Accessed via its website (www.apafri.upm.edu.my), the database is the brainchild of Indian national Dr V. Prakash who is also compiling material for a thesis database and one for on-going research.

"At just 2 to 5 sen per page, and within two days, a copy of the electronic article can be made available to the user," said Dr Prakash. This e-library project goes a long way towards making available the full range of journals to researchers and other users, who otherwise can access only a select few publications that libraries normally subscribe to.

The service is a boon to less developed countries particularly Cambodia, which along with a decimated population, suffered other losses like library resources reduced to rubble, courtesy of Pol Pot and gang. Cambodian researchers now don't need to order expensive journals to get hold of a wide variety of research findings.

A forest genetic database is also being considered to capture genetic data on forest resources before it disappears – either because of overlogging, poor forest management practices or 'bio-prospecting': the trend of patenting DNA plant material in resource-rich poor nations by resource-poor rich nations, even before discoveries for their uses are found.

APAFRI also conducts training for members. "But bringing people together for courses and workshops can be very expensive," said field coordinator Ed Sutherland, a Canadian.

So the NGO has developed CD-based courses that bring the training to the people where they are, and at a fraction of the cost. These self-paced learning tools, authored by University Of The Philippines, Los Banos researchers, incorporate text, graphics, video and sound.

Computer-assisted translations of research publications from English to regional languages are also being done to further disseminate research among members. So far translations into Malay and Mandarin (and vice versa) have

been completed. "Should funds continue to come in, the project being undertaken by Singapore-based Kent Ridge Digital Laboratories should be completed in one-and-a-half years'time," said former executive director Alias Abdul Jalil, a Malaysian. (The post has since been assumed by Dr Sim Heok Choh, formerly with FRIM Business Centre)

The NGO's main donors and supporters to date are the Canadian-based CIDA, the Australian-based ACIAR, the German-based GTZ and UN bodies FORSPA and FAO.

More on next page

New Data On Dipterocarps, Reviving Dying Forests

NEW research data on dipterocarps will be discussed at the [Seventh Round Table Conference On Dipterocarps](#), to be held in Kuala Lumpur from October 7 to 11.


The conference hopes to bring together from around the globe, researchers, policy makers, wood technologists, educationalists, conservationists and foresters who work on this family of trees to network, collaborate and foster closer ties.

Meanwhile, a team of Malaysian dipterocarp researchers have compiled information on fellow researchers in the country, completed and current research being carried out, and sources of funding. The database can be accessed via the APAFRI website.

For further details on the conference, contact The Secretariat, The Seventh Round Table Conference On Dipterocarps, c/o Forest Research Institute Of Malaysia, Kepong, 52109 Kuala Lumpur. (**Attention: Dr Baskaran Krishnapillay**). Tel: 603-6272-2516; Fax: 603-6277-3249; E-mail: dipconf@apafri.upm.edu.m.y.

Overlogging, repeated burning, shifting cultivation and other human disturbances are increasingly degrading much of Asia-Pacific's forest land. Much of this land has been converted to other uses. Those which have been left unattended have supported degraded forests that have lost much of its original structure, diversity and productivity.

Against this backdrop, the international conference, [Bringing Back The Forests: Policies And Practices For Degraded Lands And Forests](#) will be key for forest managers, planners and policy makers to assess current knowledge on forest rehabilitation, highlight successful approaches to rehabilitation and identify key policy and management needs on the subject.

For further details on the four-day gathering from October 7, visit the conference website at www.apafri.upm.edu.my or e-mail: foreconf@apafri.upm.edu.m.y 



WILLO DE WILDE

Rattan Man... Baya Busu with the cucurbit, *Bayabusua clarkei* (King)
W.J. de Wilde

Obituary

Remembering Baya

Orang Asli FRIM forester Baya Busu died in an accident on April 2. A colleague recalls the life of a man fondly missed as a co-worker and friend

By Dr Saw Leng Guan

THE unexpected death of Baya came as a complete shock to many of us. Born in Ulu Selangor on 1 April 1956 to Busu Sain of the Temuan community, Baya joined the Botany section in 1985. The FRIM herbarium traditionally employs Orang Aslis from the community nearby to help collect plant specimens, but their contribution to botanical work are sometimes not noted.

However, those of us who have worked with them know how indispensable they often are in getting botanists like myself in and out of the field safely, and in collecting specimens that on our own, would be almost impossible to obtain.

The Orang Asli as a group are easy-going people and often take life as they come. Baya displayed similar traits.

Additionally, he was ambitious and showed good leadership qualities. He joined FRIM as a lad of 18 to be a general labourer. Although he had little education, he was able to perform well enough to be promoted in 1995 to be a forester after passing a series of department examinations and an interview. His aspiration before this untimely death was to make it to be a forest ranger.

Baya had worked with Dr John Dransfield to produce the Rattan Manual For Malay Peninsula. When John started his work on the manual, very little was known of this important non-timber resource.

Baya picked up very quickly the species of rattan found in Peninsular Malaysia and, in the process, helped to locate and collect many new species of rattans. Up to the time of his death, he was probably the best field person able to identify rattans.

I have many fond memories of Baya in the field with me. At the height of the Endau-Rompin expeditions from 1985 till 1987, he was in almost all of the trips with us collecting plants in the proposed park areas. I remember one trip after the expedition proper: we tried to reach Gunong Beremban, which previously we had failed to reach. On reaching the base of the mountain using another route, he was able to correctly choose the ridges that ultimately led to the summit of this mountain.

In another trip up Gunong Kajang, Pulau Tioman, we took a route different from that villagers normally took to climb to the mountain top, and on the way back, we got lost. I had expected to put up a night in the forest, but Baya managed to get us back to the village late in the evening.

Because of his experiences in helping researchers, in 1997, I named a *Licuala* after him, *Licuala bayana*. When W.J.J.O. de Wilde from the Rijksherbarium, Netherlands visited Malaysia in 1995 to collect a wild cucumber species with an unclear affinity, Baya was assigned to help him.

In the collection trip along the road leading to Cameron Highlands from Tapah, the vine species then called *Zanonia clarkei* was located. Baya was able to climb up a very difficult and tall tree to reach the flowers and fruits of this species. Subsequently, after examining the flowers, de Wilde was able to decide that indeed this was not a *Zanonia* but a new genus altogether. In 1999, de Wilde named the genus after Baya, calling it *Bayabusua* and the species, *B. clarkei*.

Baya is survived by his two wives, Seri and Norlila, and four sons and four daughters. We share their loss greatly. **FIF**

From previous page

The Role Of APAFRL..

So long as forests are 'out there' for nations to harvest freely and forestry findings not yet trade secrets to be jealously guarded, APAFRI's role as an encourager of research networking towards sustainable forest management and everything that this entails, looks set to go on for many more years to come.

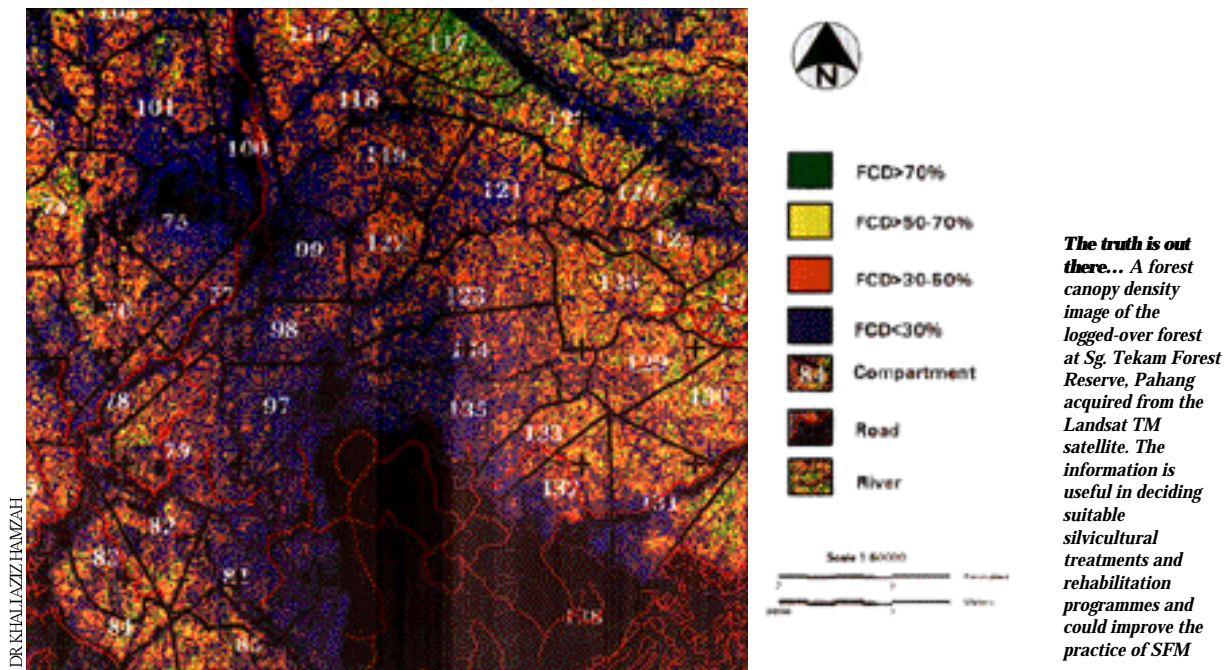
As Mr Sutherland puts it: "It's a big bite for a small organisation, but we're getting there slowly, but surely." **FIF**



Forest Geoinformatics

A Map For All Reasons

Reliable, quality maps and accurate baseline information on forests are essential for sound forestry and SFM. Here's where technology like satellite data, rather than bureaucratic statistics, come in



TREES to be felled are marked, but marking of residual trees for retention are not.

This neglect is just one area of forest management practice that can be improved with tree mapping using Differential Global Positioning System (DGPS) surveys and superior "laser-gun" survey equipment. These are then integrated with the digital resource database, Geographical Information System (GIS) used to store, analyze and retrieve data.

DGPS is a satellite-based radio navigation system providing data on three-dimensional positioning, velocity and time. To obtain DGPS coordinates, the DGPS unit transmitter must detect a minimum of four satellites. For greater accuracy, DGPS is used to offset the effects of atmospheric signal distortion, with bias errors at one location corrected with measured bias errors at a known base station.

Remote sensing is acquiring information from satellite imagery and aerial photography. This allows for a bird's eye-view of forests in forest mapping and forest classification.

Mapping logged-over forests via remote sensing can yield information such as exactly where enrichment planting needs to be done to treat poor stocking areas.

By ensuring the required 32 sound commercial trees per hectare for size class 30-45 cm or its equivalent are identified on the ground and subsequently mapped in a GIS database, harvesting operations can be monitored so that these second rotation trees are left with no damage and are able to survive for the next cut.

Once the precise location and distribution of trees are known, road and skid trails can also be built wisely, reducing both road density and distances, thus contributing towards

reduced impact logging. Also, directional felling is aided to avoid potential crop trees and watercourses.

In the same vein, the demarcation of compartment boundaries and delineation of protection areas such as river buffer zones and steep slopes are enhanced with the accuracy of such technology-aided forest mapping.

Because such technology can also provide, besides extent and distribution of forest resources, tree attributes such as species type, height and diameter at breast height, the evaluation of forest stocking for determining harvesting regimes is made more efficient.

By determining the status of forests (whether degraded, regenerating and the like), prescriptive rehabilitating programmes too can be administered more effectively with the extent, degree and causes of forest degradation obtained from remote sensing accompanied by ground-based surveys for ground truthing.

Tree mapping is yet to be extensively used in natural forest settings at operational levels, although small, pilot studies have been done. This is largely due to lack of expertise in using the technology.

In 1997, the Ministry Of Science, Technology And Environment set up its Malaysian Centre For Remote Sensing, realising the technology's potential to upgrade forestry practices.

FRIM is currently collaborating with the Forestry Department and a forest concessionaire on the use of DGPS and GIS technologies for a timber harvesting plan. **FRP**

Information for this article is obtained from Dr Khali Aziz Hamzah (khali@frim.gov.my)



Reduced Impact Logging

Reaping A Harvest Of Pain No More?

Logging is the most destructive of all forestry activities, but there are new harvesting techniques to redress this

HOT air balloons and helicopters may leave forests almost intact after logging, but they cost the earth. Under the present system, crawler tractors drive right up to tree stumps to skid felled trees to secondary roads where winch lorries continue to haul the logs to the main roadside landings.

These bulldozers, designed for building roads and not for skidding logs, are allowed to move freely in the forest using extensive, unplanned roads and skid tracks. The heavy machinery results in heavily compacted soils, soil erosion, loss of soil fertility and reduced water quality. Damage to residual stands are often in excess of 50% where skidding one tree can result in damage to 8-10 residuals (> 10 cm dbh) and tree mortality prevails for as long as 15 years.

Numerous, unplanned and over-sized log yards further add to the damage.

Ground cable systems and skyline yarding are two comparatively new harvesting techniques (known as reduced impact logging or RIL) to minimize such damage. These systems do not need skid trails as the tractor and yarder remain on the main access roads and felled logs are skidded using long cables, either along the ground (as in ground cable systems) or along a suspended cable (as in skyline yarding).

By limiting the tractor's movement in the logging site, skidding only along small corridors and reducing road networks, forest disturbance is reduced.

In hilly, rugged terrain where much of current logging is taking place, the skyline yarder system may prove more suitable.

The mobile tower yarder, a concept first introduced in 1998 by the Japanese, is now being modified for local conditions and selective cutting, in trial runs in the Jengai Forest Reserve in Terengganu. The project is a collaboration between FRIM, Japan International Research Center For Agricultural Sciences (JIRCAS) and Kumpulan Pengurusan Kayu Kayan Terengganu Sdn Bhd.

Under this system, logs of up to six tonnes is partially or completely hauled off the ground over a 300-meter corridor and a 50-meter lateral working range to the yarder where they are then transported to the roadside landings.

Another RIL technique is the ground cable system, Ecolog, that was developed by FRIM. Logs are harvested via 800-metre cables, using diversion pulleys for lateral haulage and a protective cone to minimize impact to forest floors and residual trees. Roads are reduced to a mere two percent of the compartment.

The system is also now being used by the concessionaire, Perak Integrated Timber Complex Sdn Bhd.

Studies in Indonesia have shown that forest canopy opening caused by skidding decreased by 66% with RIL, while damage to residual stands from skidding was reduced by 56%.

Damage to residual trees can also be minimised by adopting directional felling, cutting climbers and marking of important trees.

In directional felling, loggers must be trained to keep close to skid trails to facilitate extraction, keep away from river and streams and avoid hitting seedlings and young trees for future stocking.

RIL not only reduces damage to residual stands and retards soil erosion, but also helps keep forest habitats more intact for biodiversity conservation, and can in fact be considered a form of silviculture, rather than mere extraction.

Moderate increases in cost in using RIL methods should be acceptable to timber companies since they are getting less damaged, higher quality logs in return. **FFP**

Information for this article is obtained from Ismail Harun, (ismail@frim.gov.my), Dr Shamsuddin Ibrahim (sham@frim.gov.my), Muhammad Farid Abdul Rashid (farid@frim.gov.my) and Samsudin Musa (shams@frim.gov.my)



Up, up and away... Timber harvesting using the skyline yarding system



See how it bleeds... Erosion along roads and skid trails using conventional harvesting methods



No harm done... Using the Ecolog harvesting technique with main forest corridor after logging (above) and the same area (below) one year later



Pictures by JIRCAS (top) and Thomas Ng



Forest Certification

Are We Making The Grade?

An important tool in sustainable forest management, our forest certification has need for improvement

MONITORING of the environmental impact of logging practices at operational levels is seriously lacking.

Protective areas (such as steep topography and unique habitats) within active compartments are rarely mapped. Seasonal streams that can contribute to erosion and siltation are not protected, while slopes to be protected are defined as those with gradients over 40°, which is way too steep.

Roads are not built to protect against erosion and site degradation. Current logging practices have reduced residual tree stocks to below the minimum requirement of 32 trees/ha under sustainable forest management (SFM).

Very little emphasis is given to guidelines on how to benefit indigenous and local people.

Scant attention is given to biodiversity conservation with species that are important for fauna and flora linkages not marked, and habitat-providing corridors not established. Weekly and monthly field inspection reports of active compartments do not include any reference to harvesting and engineering rules or environmental monitoring.

Logging areas are too many to handle for a woefully understaffed forestry department with the short-term (six months) licences providing no incentive for loggers to care for the condition of the forest or maintain a residual stand of good quality.

Forestry staff and logging contractors need more training in many fundamental aspects necessary for well-managed forests, such as road engineering, endangered species identification, ecology and the environmental sciences, apart from silvicultural treatments.

These are some of the issues of non-compliance in forest certification, an important tool to achieve SFM.

The body overseeing timber certification in the country, the Malaysian Timber Certification Council (MTCC) comprising representatives from timber industry associations, social and environmental non-governmental organisations, academic and research institutions and government agencies, started operations in 1999.

A good certification scheme would have measurable criteria and indicators. Criteria and indicators are benchmark policies, biophysical conditions and management practices that provide a basis in determining whether a given forest is likely to survive for the long term

under its current use.

A good scheme would also involve all stakeholders, have qualified and independent third-party assessors, be credible to both consumers and stakeholders and be adapted to local conditions.

The standard used is the Malaysian Criteria, Indicators, Activities And Standards Of Performance For Forest Management Certification (MC&I) which is modelled on the International Tropical Timber Organisation (ITTO) Criteria and Indicators.

However, it is not as yet mutually recognised by the Forest Stewardship Council (FSC), the internationally-recognised

SFM: A Case Study

IN 1996, a pilot study on timber certification by a Malaysian-Netherlands collaboration was initiated in the Permanent Forest Reserves of Selangor, Pahang and Terengganu amounting to 2.37 million ha.

By June 2000, after taking into account the revised MC&I to include some missing Indicators, major Corrective Action Requests (CARs) were issued to the States concerned to achieve compliance.

By September 2001, the Keurhout Foundation Managing Board allowed audited timber from the three States to enter the Dutch market as 'Keurhout declaration' timber for a period of six months from October 2001 to March 2002.

However the three States will still need to comply with the Schedule Of Conditions from Keurhout, in addition to MC&I, before Keurhout can certify the timber products, and for this the States will have to undergo further assessments after the six-month period to evaluate their level of compliance.

The CARs issued during the assessments of these three states show up areas where much of our forestry practices are still not up to par.

These include cost-effective and practical technologies for reduced impact logging, cost-effective methods to monitor water quality, identification of endangered species of flora and fauna, developing cost-effective and operational methods to monitor changes in forest biodiversity in logged-over forests, revision of prescriptions for sustained yield within predetermined harvest levels and cutting cycles and their effective implementation and monitoring, procedures to monitor growth, composition and structure of residual forest stands and other growth parameters to support the concept of sustained yield, and determining levels of participation of local stakeholders in forest planning and management practices. **FIF**





certification council, but steps are underway to work out an FSC-MTCC collaboration to address this issue. (See Eco-Friendly Timber: Certifiable Facts on page 10)

Besides evaluating forest management, forest certification also includes what is known as chain-of-custody certification, where forest products are traced through transportation, processing and distribution chains from the forest to the final end-use.

While there can be no doubt about Malaysia's seriousness to achieve SFM, as evident in the establishment of MTCC and allocation of funds from timber export levies to finance annual forest audits, much still remains to be done judging from feedback from assessments conducted in the Pahang, Selangor and Terengganu Forest Management Units in a pilot timber certification study. (See SFM: A Case Study on previous page)

"Forest management is no longer the sole domain of foresters. The time has come for implementing organisations, research and academic institutions, the environment, wildlife and local communities to work together to address several pressing issues in SFM," said Ismail. **FRM**

Much of the information for this article is obtained from the paper, Implementation Of A National Certification Initiative: The Case Of Malaysia by Ismail Harun (ismail@frim.gov.my) and FORSPA's S. Appanah

Counting The Cost

CERTIFIED timber costs more – but only marginally so. The FSC-approved Sabah Deramakot Forest Reserve for instance had to incur an increase of about a ringgit more to log a cubic metre of forest per year.

An International Tropical Timber Organisation study found that consumers are only willing to pay for a fraction of this 'green premium': about seven to 10 percent of the non-certified timber price.

Certification costs cover investments in reduced impact logging techniques and improved roading, among others.

"However, at the same time certified wood is more saleable. This expanded market compensates for the marginal increase in certification costs," said FRIM deputy director-general Dato' Dr Wan Razali Mohd.

Dr Wan Razali, who is also a trained forest management certifier according to the FSC scheme, said loggers therefore have no excuse to avoid certifying their timber.

Trying to dump timber on less fussy markets (of which the domestic market is one) does not work out to be more profitable either as these markets do not differentiate between 'good' and 'bad' wood. But sooner or later, Dr Wan Razali believes, these non-environment-friendly markets will have to toe the line

SFM: A Success Story

THE 55,000-ha Deramakot Forest Reserve in Sabah was certified as a well-managed forest using both the MC&I and the SGS Qualified system under the Forest Stewardship Council in 1997.

Among the reasons why it passed with flying colours was its sound forest management system. The Sabah Forestry Department was fortunate to have ample assistance in this regard from the Malaysian German Sustainable Forest Management Project.

Its technical guidelines and management specifications were also supported with strong scientific research, and had undergone almost a decade of field testing. These guidelines and specifications were widely publicised, ensuring external recognition and technical credibility.

Its forest management plan included long-term management goals and was the main reference document used in its assessment. Any deviation from, or changes to, the management guidelines and technical specifications in its implementation were documented and rationalised, reducing the issuance of CARs (Corrective Action Requests).

In April last year, PT Diamond Raya became the first Indonesian timber company to get a certification, granted by the Indonesian Ecolabeling Foundation, working jointly with the FSC. **FRM**

as heightened environmental awareness sweeps across the globe.

The Indonesian-based Centre For International Forestry Research, in its Annual Report 2000, suggests that in order to 'sell' SFM in developing countries, it needs to be linked to poverty-alleviation issues. Fairer trade and prices for SFM investors also need to be promoted.

Certification of a forest area usually expires after five years, after which the area has to be reviewed for a fresh certification. Within the five-year duration, annual surveillance audits must be conducted to monitor the area.

A team of between three to five certifiers are normally formed to audit a forest and they would take anywhere from a week to a month to complete the assessment, depending on the size and complexity of the forest.

Currently, a forest concession in Peninsular Malaysia is being assessed under the FSC certification, while Permanent Forest Reserves in Johor, Kedah and Perak are being assessed according to the MC&I scheme.

Similarly, a number of rubber plantations are being assessed under the FSC scheme. **FRM**





Eco-Friendly Timber: **Certifiable** Facts

GLOBAL supply of 'good wood' is still miniscule, partly due to the long and laborious process of certification with only a handful of forests being able to quickly meet standards.

According to the Internal Tropical Timber Organisation International Workshop On Comparability And Equivalence Of Forest Certification Schemes held in Kuala Lumpur in April, close to 105 million ha of forest have been certified to be sustainably managed by February 2002, with 54% of these certified forests located in Europe, 38% in North America and eight percent in developing countries.

Today there are 26 certification schemes in the world, either operational or in the process of being established. Of these, only the Mexican-based Forest Stewardship Council (FSC) is recognised as an international scheme, while the Pan-European Forest Certification (PEFC) Council scheme is the only regional scheme. The remaining 24 schemes are national set-ups.

The FSC has as its members representatives from environmental groups, foresters, timber traders, indigenous peoples, community forest associations and forest product certification institutions. Although FSC has timber industry reps, it takes no industry money. Currently 11 certification organisations have been accredited by FSC with some 24 million ha of forests in 47 countries (about four percent of the world's forests being logged) having the FSC seal of approval. FSC has also established a Global Forest And Trade Network consisting of organisations and companies committed to producing and purchasing FSC-certified products. There are now 14 such networks in 18 countries.

In December of 2000, the Malaysian Timber Certification Council and the FSC formed a multi-stakeholder National Steering Committee (NSC) to explore the terms and conditions for collaboration. **FIF**

Biodiversity **Alert**

IT IS not enough to have areas set aside as protective forests to secure biodiversity conservation, but protected areas within production forests need to be established as well.

Even with the often-quoted prescribed goal of 10-12% protected forests to total land area, up to 50% of tropical species would disappear in a few decades.

Because of high species diversity in tropical rainforests, individuals per species are extremely low. No species or genera dominate. The rarity and low density of trees are even lower if we consider larger trees greater than 30 cm dbh (diameter at breast height). Studies in the Jengka Forest Reserve in Pahang for example, have shown that some 38% of such tree species are represented by a single, mature individual.

Most species are also randomly distributed throughout their geographical range and therefore a relatively large and continuous area of undisturbed forest is required to maintain a viable, breeding population.

Tropical rainforests, being highly complex and diverse, are also highly vulnerable to disturbances compared to temperate forests.

While temperate forests contain some five to 10 different tree species, which can survive as solitary individuals and as such, need only small patches of forests to exist, tropical rainforests contain hundreds of tree species that need whole forests to survive. In Malaysia, 357 tree species have been recorded in an area of 23 ha.

A new threat is forest fires which result in complete loss of original vegetation and colonisation by pioneers. Repeated fires permanently convert forests to grasslands. **Fires do not normally occur in undisturbed and well-managed forests** .

The most devastating fire in the country occurred in 1983, where about a million ha of forest was scorched in Sabah, with the next serious occurrence in 1997/98 in logged-over, degraded and peat lands.

Tropical rainforests are too valuable to be managed for timber alone. Thus biodiversity conservation, along with a host of environmental considerations, must figure high on the agenda of any good forest and land use policy. **FIF**

*Information for this article is obtained from the paper, **Conserving Biodiversity Of Our Forest Ecosystems Through Better Management Practices** by Samsudin Musa (shams@frim.gov.my), Shamsudin Ibrahim (sham@frim.gov.my), Wan Mohd Shukri Wan Ahmad (shukri@frim.gov.my) and Christine Fletcher (cdfletch@frim.gov.my)*

Software For SFM

A CD-ROM with a design template and instructions for creating sets of criteria and indicators tailored for different forest types have been produced and updated by the Indonesian-based Centre For International Forestry Research (CIFOR).

Developed for a variety of users, including certification bodies, government officials, forest managers and scientists, the Criteria And Indicators Modification And Adaption Tool or CIMAT II is available in English and Indonesian versions, with editions in other languages been scheduled. **FIF**



From cover page

A Call For Superior Inventory Techniques...

poor stands) to 85.4m³/ha (extremely rich stands) are being suggested.

"We found that the volume of timber being removed from forests can be inordinately high even when loggers comply with the (leaving behind of) 32 trees/ha ruling which can be well above the economic cut levels of 40m³," said Dr Abdul Rahman Kassim, who is heading the study team on the new assessment method. (According to a case study done in Dungun by FRIM's Techno-Economics Division's Ahmad Fauzi Puasa, extracting 22.37m³/ha is enough for loggers to break even.)

At present, often more than 15 trees/ha or 100-150 m³/ha are removed. Another study suggests that ideally, not more than eight trees/ha will prevent drastic canopy openings and pioneer colonisation.

Destructive logging methods have resulted in second-growth forests not growing as expected. Projected growth rates have been revised downwards to 1 to 1.5 m³/ha/yr (from 2.2 to 2.75m³/ha/yr). But even with reduced impact logging, sustainability is still threatened because the intensity of tree removal is just too high.

Minimum diameter cutting limits result in the best and largest trees (the superior stock) being removed. Hence, a maximum cut also needs to be determined to ensure that the intensity of tree removal is not too drastic.

Dipterocarps, the high-quality, highly sought-after commercial timber family, because of their clumped nature, receive more damage and suffer higher mortality during logging with the result that subsequent timber crops are skewed towards the non-dipterocarps.

This shift in residual composition impoverishes forests of high quality timber after a couple of cutting cycles. Therefore, a more flexible cutting regime that takes species composition into consideration to ensure a more proportional cut is also required.

The new growing stock assessment uses a stand density index and computer simulation to achieve desired stand

conditions across various size classes and species composition.

The assessment should ideally be made from a 100% inventory of the forest, and not from just 10% of the total forest area as at present because of manpower, time and cost constraints.

"But it's time to invest in superior inventory techniques such as Criterion survey equipment for a comprehensive inventory. Ten percent is not representative of tropical forest profiles where species composition and tree distribution patterns are highly differentiated," said FRIM Natural Forest Division director Dr Shamsudin Ibrahim.

Fifty percent of undamaged growing stock plus nine percent of damaged growing stock, amounting to 60% of the maximum stand density index is suggested as the targeted residual stand stocking, based on pre-felling inventory statistics.

A higher proportion of mid-sized trees (30 to 60 cm dbh) and a higher proportion of dipterocarps in all size classes after treatment, are other target stocking standards suggested.

The impact of these silvicultural prescriptions can then be assessed via simulation of expected stand dynamics.

While pre-felling inventory is important to determine the regeneration status and the most appropriate cutting regime, post-felling inventory provides opportunities to assess the residual stocking and damage.

Cutting cycles/rotation periods are 55 years for MUS (monocyclic) systems where forests are more drastically felled and 30 years for SMS (polycyclic) systems where harvesting is selective and intermittent.

A recent FRIM study in fact suggests 120 years as the ideal cycle if logged forests are to regenerate to their primary forest status. But the principle of delayed gratification may not find many proponents among timber tycoons. **FIF**

Information for this article is obtained from Dr Abdul Rahman Kassim (rahmank@frim.gov.my), Ismail Harun (ismail@frim.gov.my), Samsudin Musa (shams@frim.gov.my), Dr Shamsudin Ibrahim (sham@frim.gov.my) and Wan Mohd Shukri Wan Ahmad (shukri@frim.gov.my)

Environmental Impact Assessments This Is The Way To Do It

IN 1997, FRIM came out with EIA Guidelines (FRIM Technical Information Handbook No. 14: EIA Guidelines For Harvesting Of Natural Forests) for forest harvesting to complement the Department Of Environment's handbook on general procedures and requirements.

Here are some of the guidelines:-

To minimise **soil compaction and nutrient loss**, loggers are advised to

- break up compacted areas and revegetate them with fast-growing trees,
- limit areas to be opened up for roads and matau,

- use existing old roads for second harvests,
- leave logging debris to decompose slowly on site to provide a continuous source of nutrients and
- consider on-site debarking to minimise nutrient loss via biomass removal.

To minimise **soil erosion and sedimentation**, and **preserve water quality**, loggers must

- limit ground disturbance (roads, skid trails, landing sites) to not more than 10% of the operation area,
- limit forest removal to less than 40% of the standing volume,
- retain an adequate buffer strip to

maintain stream channel and for filtering sediment and logging debris,

- build roads with proper side drains, camber, silt traps and bridges, make proper road alignment along contour lines or on ridges with road gradients less than 15%, construct proper road drainage, install culverts or hollow logs for stream crossing, cross drains, build water bars on unused logging roads and stabilise filled slopes after logging, using vegetation restoration techniques,
- cease harvesting during the rainy season and
- properly dispose of chemicals used in silvicultural treatment. **FIF**



Social Forestry

Forests For **The People**

On making money grow on trees for rural farmers

LESS manpower requirements. Ample availability of abandoned agricultural land and other idle lands. The use of fallow land left by shifting cultivators and the generation of income for the rural poor.

These are solid reasons why social forestry – the planting of forest tree species together with agricultural tree crops (namely rubber and oil palm) for supplementing rural incomes – should be encouraged and made viable among our farmers.

Other reasons: it helps curb shifting cultivation and its environmental degradation effects, promotes afforestation of degraded lands and supplies raw materials for industries facing shortages due to depleting resources from natural forest harvesting.

As the country industrialises, the traditional agricultural sector is faced with a chronic labour shortage. With social forestry (or otherwise known as agro-forestry), this is not a problem. Tree crops, unlike food and cash crops, need minimum labour input except during initial planting and harvesting.

The forest trees that can be planted are durian intercropped with petai (as these share similar pollinators, namely bats) for both their fruits and timber (yes, timber!). Other trees include salak, dokong, jering, tampoi, mengkuang, sago and pandan. Fast-growing, short-term crops like mango, lime and some medicinal plants are also well suited for social forestry.

Oil yields from the bark and leaves of the pokok medang teja (*Cinnamomum* spp.) have been found to be as good as those produced from exotic trees such as *Eucalyptus globulus* and *Pogostemon cablin* distilled commercially in other countries. They can be planted for the manufacture of items like mosquito coils, joss-sticks and perfumes.

Pulpwood trees, besides rattan and bamboo planted under rubber and oil palm, have also been identified for social forestry. Animal husbandry activities can also be part of such schemes and include bee keeping, poultry rearing and sheep farming.

"While social forestry is usually for meeting subsistence needs in poorer nations, in Malaysia where rural households and even indigenous groups have been integrated into the cash-based economy, there is less dependence on the forest for food production, sources of building materials and medicines," said Dr Lim Hin Fui from FRIM's Techno-Economics Division.

He argues for a stricter definition of social forestry (as defined above). The current, official view of social forestry includes urban forestry (tree planting, provision of green



COLIN NICHOLAS/ASIA PACIFIC DEVELOPMENT CENTRE

Supper time... *Although usually viewed for their economic value to the national economy, forests are also resources on which rural communities and indigenous peoples in many developing countries still depend for their livelihoods and for their food, fuel, medicines, shelter and cultural identities. Community forestry, where joint management and shared income are practised in forestry projects, is being experimented in several such countries*

lungs), recreation forests, bamboo, rattan and fruit orchards at village fringes and forest plantations employing locals as their workforce.

Dr Lim said long gestation periods, lack of expertise and little encouragement are constraints hindering social forestry from taking root here.

"High-yielding varieties and clones, the ready supply of seeds and reliable assessments of the costs and economic returns of cultivation must be available to farmers to induce them into this sector," he said.

The provision of credit to farmers, extension programmes where farmers are continually supported with technical advice and expertise, and crop diversification must also be in place to ensure the continued viability of these projects.

Meanwhile, Malaysia's EIA guidelines on the social component of timber harvesting state that there should be no logging near human settlement areas, and that compensation should be paid if relocation is required and/or fruit orchards are affected.

Additionally, water pollution during logging must be reduced to ensure clean, drinking water, roads used by timber lorries and by people living in or close to affected forests must be well maintained, and adequate waste disposal facilities at base camps must be provided to ensure hygiene in the area. **ETP**

Information for this article is mostly obtained from Dr Lim (limhf@frim.gov.my) and his paper, Social Forestry For Rural Malaysia: Towards Income Generation

Wood Anatomy

Would You Try Wood?

Timber has advantages over other materials now being used in the building industry

TIMBER houses, contrary to popular belief, are safer than steel or brick structures in the event of a fire, provided the homes are properly designed using the right type of timber at the right place.

Burning timber, particularly large, thick types, automatically ceases midway through the wood, due to decreasing oxygen supply. Steel, on the other hand, would eventually melt and brick, crack and crumble. Wood's low thermal conductivity means timber structures remain standing, while steel constructions would collapse.

But this 'burning myth' is the reason why local building by-laws still regard timber houses as temporary structures, prompting insurance companies to impose high premiums on such homes or exclude coverage altogether. Thus generally, the construction industry shuns building timber houses.

"But FRIM is hoping to educate the authorities and industries involved on the relative safety of timber as construction material in houses," said Mr Lim Seng Choon, FRIM's wood anatomist from the Forest Products Technology Division.

Mr Lim, who conducted a three-day course on wood identification for 20 FRIM staff in March, said timber has several advantages over concrete and steel for use as non-structural and structural materials.

Its comparatively lower density and high volume to weight ratio make it easier and cheaper to transport, while its high strength to weight ratio makes it strong and versatile enough for the building industry. Plus timber looks good and is a renewable resource (although one may want to question its rate of 'renewability' in the light of illegal logging and poor forest management practices).

Wood is worked into various shapes with simple hand tools or power-driven machinery, thus lending itself to conversion not only in a factory, but also in on-the-site fabrication. It can be joined with adhesives, or with nails, screws, bolts and connectors, producing strong joints with the simplest of tools,

making wood construction competitive in building.

Flexural rigidity in relation to the weight of the material, due to the nature of its cell wall material and its distribution as a system of thin-walled tubes, is one of the outstanding mechanical properties of wood.

Wood structures can be designed to carry impact loads that are twice as great as those they can sustain under static loading. This can be contrasted with steel and concrete for which no increase in loads is allowed under similar conditions. This exceptional impact strength of wood gives it considerable mechanical and economic advantage for structures designed to resist earthquakes or for situations where abrupt loads are imposed, e.g., in aircraft carrier decking, since wood is nine times as good an energy-absorbing material as steel.

Also, unlike steel, wood has excellent vibration-damping characteristics – an important feature in bridges and other structures subject to dynamic loads. When heated, wood expands across the grain as much as or more than metals, but only little in the longitudinal direction which is important in construction. Moreover, increase in dimensions with temperature rises is frequently balanced by shrinkage caused by drying, with a corresponding increase in strength. There is no such compensating effect in metal structures which expand and lose strength progressively when heated.

Timber's only drawback is its vulnerability to attacks from insects, fungi and bacteria which feed on its living material (sapwood) containing starch and sugars. Treated timber helps address this problem. The remaining portion of timber is more durable heartwood containing substances such as dyes and phenolic (toxic) material.

There are over 700 commercial species of tropical timber in the country, most of which are hardwoods. The only softwood commercially


harvested is the damar minyak (*Agathis borneensis*) species used for wall panelling mainly.

During the course, Mr Lim described the various structural and physical features of various types of timber. Hardwoods are classified as heavy, medium or light according to their density and durability.

Heavy hardwoods such as chengal (*Neobalanocarpus heimii*), balau (*Shorea spp.*) and keranji (*Dialium spp.*) are used for structural purposes like roof trusses. Medium hardwoods like kempas (*Koompassia malaccensis*) and kapur (*Dryobalanops aromatica*) are used for semi-structural purposes like door and window frames, while light hardwoods like nyatoh (spp. of *Sapotaceae*), rubberwood (*Hevea brasiliensis*), terentang (*Camphusperma spp.*) and sepetir *Sindora spp.*) are used for general utility purposes like chopsticks, tool handles, planks, veneer and plywood.

"People often ask me what is the best timber around, but as you can see, there is no such thing. It all depends on the use the timber is fashioned for," said Mr Lim.

Hardwoods with 'nice figures' (attractive grain or arrangement of fibres in the wood) include surian (*Toona spp.*), surian batu (*Chukrasia tabularis*), bintangor (*Calophyllum spp.*), angšana (*Pterocarpus indicus*) and teak (*Tectona grandis*). Such timber is used for making high-value furniture, flooring and wall panelling.

The colour of wood and the distribution pattern of its vessels (pipe-like channels in wood for sap transportation) and parenchyma (food storage cells) are other features that distinguish the various types of timber. For more information, contact Mr Lim at limsc@frim.gov.my. 



Nursery

Nursing Plants For Profit

Hybrid lot turned up for FRIM's nursery course

APASTOR with green fingers, a loving wife, a nature-loving building contractor and a dedicated municipal council worker. These were among the 25 people from foresters to entrepreneurs who signed up for FRIM's nursery course in April.

Pastor Francis Ho couldn't resist the temptation to plant his 'gardens of eden' in church compounds wherever he was posted.

He now plans to start a nursery in Puchong and found the teaching on grafting to be most useful. However, he would like the course to have more practical input.

Puan Misbah Salleh shares Pastor Ho's view in this respect. "Yes, more practice, less talk, please," said this clerk in a construction company. She is taking up the course to share in her electrician husband's hobby so that they can enjoy growing plants together.

"I would like to work outdoors one day where the air is fresh. I am tired of working in an air-conditioned office all day," she said. The couple plan to set up a nursery in Puan Misbah's hometown of Kedah, where she said, there is a lot of idle land that can be made use of.



The Licuala grandis (Ruffed Fan Palm) would make an attractive plant for an ornamental garden

Mr Arumugam Periasamy has been working in the Kajang Municipal Council's nursery for 19 years. A stickler for perfection

and always looking for ways and means to perfect his art, Mr Arumugam found the topic of plant diseases and hybrids to be most useful.

Increasingly gardens, and not buildings, are getting the attention of building contractor Nor Mohamad Sahar. "A lot of people in new housing estates now want to grow their own gardens. I want to be able to advise them on such things as the supply of good seeds, planting techniques and maintenance," he said.

The course covered the establishment of nurseries and their costing, techniques of plant propagation, potting media preparation, collection and handling of wildlings, instant tree planting for landscaping, fertiliser application, weeding, root and branch pruning and the identification and control of diseases and insects.

The course is held once every two years and announced via FRIM's website. For more information, contact Dr Aminah Hamzah from FRIM's Nursery Unit at aminah@frim.gov.my or call her at 03-62797124. **ETP**

Announcements

Notice Chipboard

AWARDS

FRIM were among those awarded the **Preserve Planet Earth Awards 2002** by **Rotary International District 3300** in April. The award, in the form of a certificate, was presented by Minister of Science, Technology And Environment Dato'Seri Law Hieng Ding.

STAFF NEWS

Appointments

Dr Kodi Isparan Kandasamy (January 3), **Yek Sze Huei** (January 17), **Hamidah Mamatas** (February 15), **Chee Beng Jin** (February 2), **Jamaludin Budin** (January), **Mohd Nazrin Yahya** (February), **Khairul Najwan Ahmad Jahari** (March 1) and **Hui Ting Fui** (April 1) as **Research Officers**.

Veronica Poopathy as **Information Officer** (January 2)

Norain Mohd Arif as **Librarian** (April 1)

Promotions

Mohd Zamshari Abdul Rahman from Accountant to **Administration And Finance Division Director** from January 1

Transfers

Wan Rahmah Wan Abdul Raof from Administration And Finance Division Director to **Corporate Development Division Director** from January 1

Retirements

Baharuddin Kasran from April 19, **Tuminah Siran** from April 1 and **Ahmad Alias** from January 2

Resignations

Dr Andrew Wong Han Ho left FRIM effective March 1 to take up his new post as Associate Professor at Universiti Malaysia Sarawak, and effective May 1, **Dr Ahmad Sakri Mat Seman** and **Dr Maziah Zakaria** left to become Associate Professor at Universiti Teknologi Tun Hussein, Johore, and Universiti Sains Malaysia lecturer in Penang, respectively.

ERRATA

IT WAS inadvertently reported in our previous issue (page 14) that the *Tree Flora Of Sabah and Sarawak* (Volume 3) is 119 pages and costs RM50. The **511-page** book costs **RM 100/USD 100**.

The picture on page 12 in our *The Art Of Mining Trees* article depict **Khaya ivorensis** and not *Fagraea crenulata* trees. In the sixth paragraph of the same article, *Hopea odorata* should be **Hopea odorata**. The errors are regretted. **ETP**

Neat **Peat** Guide, This

Detailed descriptions and exceptional photographs make this field guide on common trees in Peninsular Malaysia's peat swamp forests an excellent resource for foresters and ecologists

Common Trees In Peat Swamp Forests Of Peninsular Malaysia by Ng Tian Peng and Shamsudin Ibrahim; 2001/ 97 pages; RM 80/USD 80; Order Code:RP 124

Review by Aaron M. Ellison

PPEATLANDS, the waterlogged wetland ecosystems in which the extremely slow rate of decomposition results in the accumulation of dead plant matter ('peat'), account for nearly one-third of the global pool of soil-bound carbon.

Much research has been focused on how they affect global climate change. Tropical peatlands, however, have received far less attention compared to those in boreal North America and Europe.

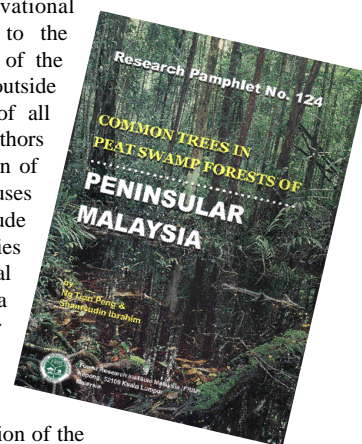
Unlike their boreal cousins, tropical peatlands are dominated by trees. The species diversity of tropical peat forests is much lower than that of the better-known upland rainforests, but they nonetheless support a wide range of species that have broad economic and ecological importance. This new research pamphlet provides foresters and researchers with a much-needed field guide to 56 of the most common tree species of the peat swamps of Peninsular Malaysia (out of a list of 130 species that occur in these swamps).

As with most field guides, the strengths of this book are the detailed descriptions of each tree, and the exceptional photographs of each species. The authors have gone to great lengths to obtain wide-angle photographs, in the field, of the boles in the forest, and detailed close-up photographs of the bark, leaves, fruits, seeds, and seedlings. While fewer than half of the tree species of these peat swamp forests are illustrated, nearly two-thirds (25 of 39) of the families are represented.

But the attention given to the trees' ecology and distribution is less rewarding. The type of data given is inconsistent. For example, neither elevational limits, nor restrictions to the eastern or western sides of the peninsula, nor the range outside of Peninsular Malaysia of all species are given. The authors provide a short description of the current commercial uses for each species, and include descriptions of many species that have no commercial use. The reader thus gets a good overall feeling for the diversity in these forests, not just their utility as lumber sources.

However, the description of the forest's distribution, hydrology, and structure is scant and will not help a newcomer to these forests understand them better. The presentation of forest production, conservation and threats to these forests is even-handed, but I also was left hoping for much more detail on all of these.

Overall, this book will be an excellent resource for foresters and ecologists learning how to identify the common trees in peat swamp forests of Peninsular Malaysia. They are to be commended for producing a first-rate field guide. **FTF**



Ellison is from the Department of Biological Sciences, Mount Holyoke College, South Hadley, Massachusetts, USA

Some FRIM Bestsellers

Pocket Check List Of Timber Trees by J. Wyatt-Smith; Third Revision by K.M. Kochummen; 1999/367 pages; RM 30/US 30; Order Code: MFR 17

THE last major effort in plant taxonomy by the late Mr Kochummen, this book covers dipterocarp and non-dipterocarp trees and their keys, vegetative characters useful in identifying Peninsular Malaysia's forest trees, the 1974 regeneration sampling list and an index to scientific names. Changes and corrections to some botanical names have also been added.

Rubberwood Processing And Utilisation by L.T. Hong and H.C. Sim (Editors); 1999/254 pages; RM 60/USD 60; Order Code:MFR 39

EVERYTHING you wanted to know about rubberwood and more, this new edition includes the economics of planting rubber trees as forest plantations besides such areas as availability and characteristics of the wood, its harvesting methods and rubberwood products.

Timber Design Handbook by Chu Yue Pun, Ho Kam Seng, Mohd. Shukari Midon and Abdul Rashid Abdul Malik; 1997/288 pages; RM 39/USD 39; Order Code: MFR 42

A HANDY book for Malaysian designers working with local timbers, this handbook guides users in engineering design principles and how these relate to timber behaviour. Much of the data represent up-to-date results of tests conducted in FRIM. **FTF**



Laughter in the rain...
Teachers Alan Ward and Ms Bevear led the children during the International School Of Kuala Lumpur's outing at FRIM

YAZIDNYAN

Hands Up All Who Love FRIM!

DESPITE raining elephants and whales, a group of 83 nine and 10-year-olds from the International School of Kuala Lumpur found camping at FRIM's grounds a worthwhile experience.

Although they had to abandon their night walk, astronomy and campfire sing-along, the April torrent failed to dampen their spirits. Yes, there were fets and frowns, but in the easy, forgiving manner of children, these were soon soothed away by improvised activities, the comforting patience of their chaperones and – lollipops! Putting up the tents were educational and a lot of fun, and so were the camp games they played huddled under their tents.

Fortunately, the youngsters managed to enjoy the thrill of the canopy walkway and savour the sights and sounds of a guided nature trail in the morning when they checked in. The children, representing some 15 countries including Korea, Japan, Australia, the United States, Denmark and Yugoslavia, also got to visit FRIM's museum.

Will they be coming back? "Definitely! But perhaps not during the rainy season," said teacher Skyline Bevear, one of the 10 adults who accompanied the pupils. For more information on FRIM's camping and other nature education activities, contact Jaafar Ahmad (jaaffar@frim.gov.my) or call 03-62797525. **ETP**

Passing The Torch

TRAINEE Akzam Syukri reports for duty bright and early and forays into the Bukit Hari Forest Reserve, on the lookout for *Acacia mangium* and *A. auriculataeformis* wood samples that have been attacked by wood borers.

He will measure the samples' timber density and then some of the better samples would be used to produce *Acacia* hybrids. The 21-year-old biotechnology management student at Universiti Kebangsaan Malaysia is one of 32 undergraduates who have been undergoing training at FRIM since March.

"It's fun working here. I am acquiring much knowledge," enthused the eager beaver at FRIM's Forest Plantation Division. His pal Amirzaidi Jubaidi, 23, also at this Division, said: "I learnt how to measure tree height and how to treat trees during a tree

inventory exercise at the Kemasul Forest Reserve in Pahang," said Amirzaidi, a rehabilitative biology student at Universiti Malaysia Sabah.

For Lee Geok Lin, assigned to the Forest Environment Division, it's the pleasant working environment that attracts her. "There's never a dull moment, too," added the 22-year-old forestry student from Universiti Putra Malaysia. Her university mate and fellow forestry student, Subashini Krishnan, 21, echoed her feeling. For more information on FRIM's training programmes, contact Ruziah Ripin (ruziah@frim.gov.my) or call 03-62797522. **ETP**

Trainee Fong Siow Ni, a communications student from Universiti Sains Malaysia, contributed the facts for this report

YAZIDNYAN



The future in their hands... (from left) Amirzaidi, Siow-Nj, Geok Lin, Subashini, UPM Human Resource Development student Najwa Menhat and Akzam